Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Australia SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	86	0.8	88	1.0	84	0.9
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	79	1.0	80	1.4	77	1.5
F06	No	Relate rusting iron to the presence of oxygen and moisture.	73	1.3	74	1.9	72	1.5
G10	No	Select correct statement regarding the atomic makeup of matter.	58	1.4	63	1.5	52	2.2
H06	No	Know if wood-burning reaction absorbs or releases energy.	61	1.5	67	2.1	55	1.7
J03	Yes	Know relationship between molecules, atoms and cells.	27	2.0	34	2.8	20	2.5
J04	Yes	Distiguish between a chemical reaction and a physical change.	52	2.2	51	3.0	53	2.7
J06	Yes	Know what happens to atoms in animal after death.	36	2.0	38	2.7	33	2.7
J08	Yes	Identify gas involved in fire ignition.	38	2.1	39	2.6	36	3.0
M10	Yes	Identify substances which are mixtures.	47	2.0	49	2.8	44	3.0
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	54	1.7	55	2.4	51	3.0
N07	Yes	Explain oxygen fuel requirements of burning candle.	91	1.2	93	1.5	90	1.9
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	61	2.0	58	2.5	64	2.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	40	2.1	42	3.1	37	2.6
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	31	2.2	30	3.0	32	2.9
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	47	1.8	47	2.8	46	2.4
Q15	Yes	Determine physical processes involving chemical change.	47	2.3	46	3.2	48	2.7
R05	Yes	Explain how carbon dioxide fire extinguishers work.	61	1.9	66	2.3	57	3.1
Z01A	Yes	Explain why steel bridges must be painted.	77	1.8	81	2.6	72	2.5
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	45	2.1	48	2.7	43	2.9
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	26	2.1	27	3.0	24	2.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Australia SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	59	1.0	61	1.4	56	1.3
B01	No	Identify hottest layer of the Earth.	87	0.8	91	0.9	83	1.4
B05	No	Use elevation/weather diagram to locate earth feature.	49	1.3	49	1.8	49	1.4
C07	No	Relate mountain shape to age.	37	1.6	43	2.1	32	1.7
D03	No	Identify direction of river flow on contour map.	46	1.4	51	2.0	41	1.9
E09	No	Use table of time/temperature to determine point when weather changes.	89	0.8	87	1.2	90	0.9
E12	No	Identify type of stone involved in cave formation.	47	1.3	50	1.5	45	1.8
F05	No	Relate level of oxygen to elevation.	89	0.8	90	1.3	89	1.0
G11	No	Identify type of rock from description of its formation.	59	1.5	60	2.1	59	1.8
H03	No	Select explanation for moonlight.	82	1.3	85	1.6	79	1.7
H04	No	Identify ground layer containing the most organic material.	57	1.4	61	1.8	53	1.6
I17	Yes	Know energy source for Earth’s water cycle.	44	2.0	46	3.1	42	2.3
J01	Yes	Know changes in Earth’s surface over billions of years.	41	2.0	41	3.3	40	2.7
K15	Yes	Know organic origins of fossil fuels.	62	2.2	62	2.7	63	2.9
O12	Yes	Know relative amounts of components in air.	16	1.6	17	2.3	14	2.1
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	68	1.8	71	2.5	65	2.4
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	83	1.4	78	2.2	87	1.8
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	42	1.8	46	2.7	37	2.3
Q16	Yes	Estimate time for light from star to reach Earth.	40	1.9	48	2.2	31	2.7
R04	Yes	Give reason why ozone layer is important for life.	51	1.8	55	2.8	47	2.7
W01A	Yes	Give reason region in land/water diagram is a good farming location.	83	1.4	80	1.9	87	1.4
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	58	1.8	60	2.0	55	2.5
W02	Yes	Draw diagram showing Earth’s water cycle.	33	1.7	35	2.5	30	2.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Australia SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	79	1.0	81	1.3	76	1.2
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	65	1.3	72	1.7	59	1.6
F04	No	Predict type of area where soil erosion by rain is most likely.	80	1.0	80	1.5	79	1.3
G12	No	Identify a nonrenewable natural resource.	60	1.2	65	1.7	55	1.9
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	46	2.0	48	3.0	45	3.1
I13	Yes	Select best scale for accurate measurement.	50	2.1	50	2.9	50	3.3
I15	Yes	Identify the type of scientific statement given in an experimental report.	69	1.8	62	2.8	76	2.3
I18	Yes	Write conclusion from summary of experimental observations.	52	2.5	46	3.3	58	3.2
K19	Yes	Write an example of how computers are used to do work.	84	1.9	80	2.4	87	2.2
N01	Yes	Determine correct control experiment to test hypothesis.	48	1.5	49	2.5	47	2.4
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	70	2.5	71	3.2	70	2.8
N05	Yes	Identify a principal cause of acid rain.	42	2.0	49	2.7	35	2.4
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	63	1.9	58	2.6	68	2.7
Z02A	Yes	Write a reason why not all people have enough water.	77	1.9	75	2.7	80	2.2
Z02B	Yes	Write a second reason why not all people have enough water.	51	2.1	47	3.0	56	2.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Australia SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	77	0.9	72	1.2	81	1.1
B04	No	Predict pulse/breathing rate change after exercise.	93	0.6	92	0.9	95	0.7
C08	No	Identify carrier of signals from eye to brain.	80	1.0	81	1.5	79	1.3
D05	No	Identify system carrying sensory messages to the brain.	67	1.2	71	1.8	63	1.4
D06	No	Relate plant part to seed development.	69	1.1	73	1.4	65	1.6
E08	No	Select correct statement of trait heredity from parents.	74	1.0	69	1.4	79	1.3
E10	No	Determine characteristics for classifying animals.	68	1.3	68	1.8	67	1.8
F01	No	Identify characteristic of mammal.	61	1.2	61	1.6	61	1.6
F03	No	Identify human organ which interprets senses.	77	1.2	78	1.5	77	1.5
G08	No	Identify main function of red blood cells.	76	1.0	76	1.5	77	1.3
G09	No	Identify reproductive cells involved in heredity.	70	1.3	66	1.6	74	1.6
H01	No	Identify the functions of blood.	79	1.0	77	1.5	81	0.9
H02	No	Identify the role of vitamins.	82	0.9	79	1.2	86	1.2
I10	Yes	Identify nutrition content of fruits and vegetables.	68	1.8	61	2.6	74	2.2
I11	Yes	Know identifying features of insects.	52	2.3	56	2.7	49	3.2
I14	Yes	Relate elbow action to a simple machine.	58	1.7	57	2.5	59	2.5
I19	Yes	Identify statement of oxygen production consistent with data.	59	2.3	57	3.1	61	2.9
J02	Yes	Choose species on Earth for shortest time.	84	1.8	82	2.8	86	1.9
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	59	2.0	56	2.8	61	2.8
J09	Yes	Explain how to determine the age of a cut tree.	67	2.0	68	2.6	66	2.9
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	58	1.9	55	2.7	61	2.5
K12	Yes	Relate reproductive cell production to population.	70	1.8	70	2.6	70	2.6
K16	Yes	Identify common product made with bacteria.	42	2.5	41	3.1	42	3.0
K18	Yes	Identify main function of chloroplasts in plant cell.	54	1.9	51	2.3	57	2.5
L02	Yes	Select reason why algae are close to ocean surface.	58	1.8	60	3.0	55	2.5
L03	Yes	Identify skull features typical of predators.	70	2.2	70	3.3	69	2.8
L05	Yes	Select most likely purpose for birds' singing.	68	1.9	68	2.4	68	2.5
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	59	2.0	59	2.8	60	2.9
M11	Yes	Complete a food web showing energy relationships.	73	2.1	73	2.9	73	2.8
N02	Yes	Choose meal which would give the most nutrients.	55	1.9	50	3.0	61	2.5
N04	Yes	Identify how decaying fish fertilize plants.	53	1.9	55	2.7	51	2.6
N06	Yes	Identify the most basic unit of living things.	68	2.0	68	2.7	68	2.8
O16	Yes	Give reason for thirst on a hot day.	64	2.0	66	2.8	63	2.6
O17	Yes	Describe how disease may be transmitted.	55	1.9	53	3.2	57	2.4
P04	Yes	Identify what happens to animals' biological processes during hibernation.	49	2.1	51	2.8	48	2.7
P06	Yes	Describe digestion occuring in the mouth.	60	2.3	56	3.3	65	2.6
Q17	Yes	Describe the advantage of having two eyes.	78	1.6	73	2.3	84	2.3
R03	Yes	Give example of consequences of introducing new species.	36	1.8	37	2.2	36	3.0
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	15	1.2	12	1.4	19	1.4
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	63	1.5	61	2.2	66	2.0
X02B	Yes	Explain why light is important in aquarium ecosystem.	24	1.4	23	2.0	24	1.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Australia SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	77	0.7	76	1.0	78	0.9
A10	No	Relate light level and reflectance to vision of object.	77	0.7	78	0.9	77	1.0
B02	No	Know type of energy released from combustion engine.	57	1.0	58	1.6	55	1.3
B03	No	Determine density from mass/volume table.	22	1.1	26	1.6	19	1.2
B06	No	Relate color of object to amount of light reflection.	89	0.7	89	0.8	89	1.0
C09	No	Identify correct position of reflected image.	76	1.0	79	1.5	73	1.5
C12	No	Identify substance which is NOT a fossil fuel.	52	1.1	55	1.7	48	1.5
D01	No	Identify correct diagram of light rays through lens.	46	1.5	56	1.6	37	1.8
D02	No	Identify substance from magnetic properties.	81	1.0	84	1.4	78	1.6
D04	No	Relate physical event to its sequence of energy changes.	65	1.3	68	1.7	63	1.7
E07	No	Identify particles found in the nucleus of atoms.	41	1.7	40	1.8	43	2.3
E11	No	Find shadow size from diagram of bulb/card/screen distances.	60	1.4	62	1.9	58	1.6
F02	No	Relate color and light reflection to temperature of object.	73	1.5	74	2.2	73	1.9
G07	No	Identify correct way to place batteries in a flashlight.	91	0.6	92	0.8	89	0.9
H05	No	Identify source of energy stored in food.	29	1.7	30	2.3	28	1.8
I16	Yes	Identify material with greatest heat conductivity.	86	1.4	85	1.9	88	1.8
J05	Yes	Identify type of solar radiation that causes sunburn.	86	1.4	89	1.9	84	2.2
K10	Yes	Describe a method demonstrating the existence of air.	45	2.0	42	2.5	48	2.8
K13	Yes	Identify electrical conductors that form complete circuits.	83	1.4	88	1.8	78	2.2
K14	Yes	Relate evaporation rate to surface area.	82	1.8	82	2.7	81	2.2
K17	Yes	Relate presence of gravitational force to position of falling object.	57	2.0	60	2.8	54	2.7
L01	Yes	Select diagram showing forces resulting in rotation.	55	1.9	59	3.0	51	2.6
L04	Yes	Explain most efficient engine.	51	2.1	48	3.0	54	2.7
L07	Yes	Relate sound transmission to air.	73	2.0	71	2.9	74	2.6
M12	Yes	Complete table of voltage/current data for circuit.	57	2.2	63	3.3	50	2.8
M14	Yes	Draw reflected image of object.	70	1.8	71	2.7	70	2.2
N08	Yes	Relate lever arm lengths to balanced weights.	80	1.9	83	1.9	76	2.8
N10	Yes	Determine effect of tipping container on water surface.	57	2.0	68	2.7	46	2.8
O10	Yes	Identify polarity of ends of cut magnet.	67	1.6	67	2.3	67	2.6
O13	Yes	Relate circular motion to centripetal force.	64	1.7	67	2.3	61	2.6
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	90	1.2	89	1.6	92	1.8
P02	Yes	Explain relationship between illuminance and distance of light source.	28	1.6	33	2.4	23	2.2
P05	Yes	Explain why balloon expands upon heating.	52	1.8	55	2.6	49	2.8
Q12	Yes	Explain how focusing affects the amount of light.	55	1.7	54	2.3	56	2.9
Q13	Yes	Compare heat expansion properties of metal and glass.	63	1.8	64	2.4	61	2.5
Q18	Yes	Explain effect of melting on the mass of ice cubes.	43	1.9	44	2.5	42	3.3
R01	Yes	Choose diagram showing angle of reflected light.	75	1.6	78	2.1	72	2.3
R02	Yes	Identify reflection/absorption properties from color.	49	2.4	51	3.0	46	2.8
Y01	Yes	Explain amount of light/electric energy in a lamp.	7	0.9	9	1.4	5	0.9
Y02	Yes	Explain temperature of melting snowball.	11	0.9	11	1.1	12	1.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Austria SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	85	1.2	86	1.6	84	1.6
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	85	1.4	85	1.9	86	1.9
F06	No	Relate rusting iron to the presence of oxygen and moisture.	73	1.9	74	2.3	72	2.7
G10	No	Select correct statement regarding the atomic makeup of matter.	60	2.2	64	2.5	55	3.1
H06	No	Know if wood-burning reaction absorbs or releases energy.	72	2.2	81	2.0	63	3.3
J03	Yes	Know relationship between molecules, atoms and cells.	28	3.6	37	5.2	19	4.0
J04	Yes	Distiguish between a chemical reaction and a physical change.	48	3.5	51	4.0	46	5.1
J06	Yes	Know what happens to atoms in animal after death.	28	2.6	27	3.6	30	3.9
J08	Yes	Identify gas involved in fire ignition.	52	3.7	56	5.0	46	4.7
M10	Yes	Identify substances which are mixtures.	52	3.5	49	4.4	53	4.7
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	64	3.1	69	4.1	60	4.4
N07	Yes	Explain oxygen fuel requirements of burning candle.	95	1.5	94	2.1	95	1.8
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	60	3.2	62	4.6	59	4.8
O11	Yes	Identify which change in elemental form is due to a chemical change.	43	3.4	48	4.5	38	4.5
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	64	3.1	70	3.8	57	4.1
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	53	3.3	56	4.4	51	4.7
Q15	Yes	Determine physical processes involving chemical change.	34	3.5	34	4.4	35	5.0
R05	Yes	Explain how carbon dioxide fire extinguishers work.	74	2.9	81	3.5	70	3.9
Z01A	Yes	Explain why steel bridges must be painted.	71	2.6	77	3.9	65	4.3
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	51	3.2	52	3.9	49	4.3
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	34	3.0	29	4.2	39	4.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Austria SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	65	1.4	68	1.7	63	2.1
B01	No	Identify hottest layer of the Earth.	92	0.9	95	1.0	90	1.5
B05	No	Use elevation/weather diagram to locate earth feature.	55	2.1	58	2.4	51	3.0
C07	No	Relate mountain shape to age.	32	1.9	36	2.4	27	2.3
D03	No	Identify direction of river flow on contour map.	44	1.7	54	2.6	34	2.3
E09	No	Use table of time/temperature to determine point when weather changes.	86	1.5	89	1.6	82	2.1
E12	No	Identify type of stone involved in cave formation.	66	1.9	68	2.2	63	2.6
F05	No	Relate level of oxygen to elevation.	86	1.2	84	1.8	88	1.7
G11	No	Identify type of rock from description of its formation.	65	2.2	62	2.7	69	2.9
H03	No	Select explanation for moonlight.	89	1.2	91	1.8	88	1.8
H04	No	Identify ground layer containing the most organic material.	64	1.8	67	2.2	62	2.6
I17	Yes	Know energy source for Earth’s water cycle.	56	3.5	57	4.3	57	5.2
J01	Yes	Know changes in Earth’s surface over billions of years.	44	3.4	42	4.7	45	4.6
K15	Yes	Know organic origins of fossil fuels.	83	2.2	87	2.4	80	3.9
O12	Yes	Know relative amounts of components in air.	42	3.6	46	4.5	39	5.0
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	69	2.5	75	3.1	64	3.7
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	79	2.7	75	4.4	81	3.1
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	55	2.3	61	4.4	51	3.3
Q16	Yes	Estimate time for light from star to reach Earth.	27	2.8	36	5.3	18	3.1
R04	Yes	Give reason why ozone layer is important for life.	65	3.1	70	4.2	62	4.6
W01A	Yes	Give reason region in land/water diagram is a good farming location.	78	2.0	77	2.5	78	2.6
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	44	2.3	42	2.9	45	3.7
W02	Yes	Draw diagram showing Earth’s water cycle.	43	2.3	48	2.9	37	3.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Austria SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	66	1.7	70	1.7	61	2.7
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	45	2.2	52	2.9	38	2.9
F04	No	Predict type of area where soil erosion by rain is most likely.	76	1.7	78	2.4	74	2.3
G12	No	Identify a nonrenewable natural resource.	53	2.1	58	2.9	47	3.0
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	40	3.2	37	4.1	45	4.8
I13	Yes	Select best scale for accurate measurement.	76	2.9	78	3.2	74	4.2
I15	Yes	Identify the type of scientific statement given in an experimental report.	66	2.8	64	4.0	69	3.8
I18	Yes	Write conclusion from summary of experimental observations.	27	2.3	25	3.4	29	3.8
K19	Yes	Write an example of how computers are used to do work.	74	3.2	69	4.3	79	3.6
N01	Yes	Determine correct control experiment to test hypothesis.	52	3.1	53	4.4	51	4.0
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	58	2.8	64	3.9	52	3.9
N05	Yes	Identify a principal cause of acid rain.	55	3.1	56	4.1	52	4.7
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	36	2.7	36	3.8	35	4.3
Z02A	Yes	Write a reason why not all people have enough water.	58	3.8	57	4.9	58	4.6
Z02B	Yes	Write a second reason why not all people have enough water.	44	2.5	42	3.6	46	3.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Austria SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	83	1.1	80	1.6	86	1.6
B04	No	Predict pulse/breathing rate change after exercise.	94	0.7	92	1.2	95	0.7
C08	No	Identify carrier of signals from eye to brain.	85	1.3	87	2.0	85	2.0
D05	No	Identify system carrying sensory messages to the brain.	78	1.4	82	1.9	74	2.1
D06	No	Relate plant part to seed development.	88	1.3	87	1.6	88	1.9
E08	No	Select correct statement of trait heredity from parents.	88	1.3	86	1.8	92	1.5
E10	No	Determine characteristics for classifying animals.	57	1.9	59	2.3	55	2.8
F01	No	Identify characteristic of mammal.	62	2.3	58	2.6	64	3.4
F03	No	Identify human organ which interprets senses.	81	1.8	81	2.1	80	2.2
G08	No	Identify main function of red blood cells.	77	1.8	80	2.2	75	2.2
G09	No	Identify reproductive cells involved in heredity.	82	1.8	81	2.2	83	2.0
H01	No	Identify the functions of blood.	89	1.3	91	1.5	87	2.0
H02	No	Identify the role of vitamins.	85	1.5	85	2.1	86	1.8
I10	Yes	Identify nutrition content of fruits and vegetables.	93	1.7	90	2.6	96	1.5
I11	Yes	Know identifying features of insects.	52	3.1	56	4.9	46	4.5
I14	Yes	Relate elbow action to a simple machine.	69	3.1	71	4.2	68	4.3
I19	Yes	Identify statement of oxygen production consistent with data.	59	3.1	61	3.9	57	4.5
J02	Yes	Choose species on Earth for shortest time.	80	2.5	83	3.2	76	4.1
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	36	3.2	33	4.2	41	4.4
J09	Yes	Explain how to determine the age of a cut tree.	92	2.0	93	2.5	90	2.6
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	61	2.5	63	3.5	59	4.1
K12	Yes	Relate reproductive cell production to population.	47	2.9	51	4.4	42	4.2
K16	Yes	Identify common product made with bacteria.	26	3.0	29	3.9	24	4.4
K18	Yes	Identify main function of chloroplasts in plant cell.	54	3.2	55	4.4	50	4.5
L02	Yes	Select reason why algae are close to ocean surface.	76	2.6	77	4.0	74	4.1
L03	Yes	Identify skull features typical of predators.	84	2.2	86	3.1	82	3.7
L05	Yes	Select most likely purpose for birds' singing.	64	3.3	70	5.3	57	4.5
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	59	3.4	57	4.6	60	4.2
M11	Yes	Complete a food web showing energy relationships.	74	2.8	70	3.5	76	3.6
N02	Yes	Choose meal which would give the most nutrients.	40	3.1	35	3.8	46	4.7
N04	Yes	Identify how decaying fish fertilize plants.	25	2.6	27	3.5	23	3.6
N06	Yes	Identify the most basic unit of living things.	66	3.3	70	4.5	63	4.2
O16	Yes	Give reason for thirst on a hot day.	70	3.1	76	3.6	64	4.7
O17	Yes	Describe how disease may be transmitted.	63	2.3	58	3.8	69	3.5
P04	Yes	Identify what happens to animals' biological processes during hibernation.	77	3.3	79	4.5	76	4.2
P06	Yes	Describe digestion occuring in the mouth.	64	3.4	66	4.1	63	4.9
Q17	Yes	Describe the advantage of having two eyes.	56	3.3	56	4.5	57	4.5
R03	Yes	Give example of consequences of introducing new species.	10	1.8	13	3.0	7	2.2
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	9	1.3	8	1.5	9	1.9
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	85	1.8	84	2.3	85	2.3
X02B	Yes	Explain why light is important in aquarium ecosystem.	45	2.8	48	3.5	41	3.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Austria SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	72	1.5	71	1.9	73	2.0
A10	No	Relate light level and reflectance to vision of object.	77	1.3	79	1.6	76	2.1
B02	No	Know type of energy released from combustion engine.	68	1.7	69	2.3	67	2.8
B03	No	Determine density from mass/volume table.	31	1.5	35	2.1	26	2.1
B06	No	Relate color of object to amount of light reflection.	91	1.1	91	1.6	91	1.4
C09	No	Identify correct position of reflected image.	72	2.0	73	2.9	70	2.5
C12	No	Identify substance which is NOT a fossil fuel.	62	2.0	66	2.7	58	2.5
D01	No	Identify correct diagram of light rays through lens.	38	2.2	48	2.9	28	2.8
D02	No	Identify substance from magnetic properties.	90	1.1	92	1.7	88	1.6
D04	No	Relate physical event to its sequence of energy changes.	60	1.9	67	2.3	53	2.9
E07	No	Identify particles found in the nucleus of atoms.	62	2.2	62	2.8	63	3.0
E11	No	Find shadow size from diagram of bulb/card/screen distances.	69	2.0	71	2.1	66	3.1
F02	No	Relate color and light reflection to temperature of object.	83	1.7	86	1.8	79	2.8
G07	No	Identify correct way to place batteries in a flashlight.	92	1.1	94	1.3	90	1.9
H05	No	Identify source of energy stored in food.	24	1.7	26	2.3	23	2.3
I16	Yes	Identify material with greatest heat conductivity.	88	2.4	92	2.1	87	3.5
J05	Yes	Identify type of solar radiation that causes sunburn.	78	2.8	79	3.6	76	4.4
K10	Yes	Describe a method demonstrating the existence of air.	23	2.9	26	4.0	20	3.6
K13	Yes	Identify electrical conductors that form complete circuits.	91	1.7	93	2.3	89	3.0
K14	Yes	Relate evaporation rate to surface area.	86	2.0	87	3.0	86	3.0
K17	Yes	Relate presence of gravitational force to position of falling object.	61	2.9	60	4.3	60	4.5
L01	Yes	Select diagram showing forces resulting in rotation.	58	3.6	63	4.5	52	4.6
L04	Yes	Explain most efficient engine.	62	3.2	62	4.7	64	3.7
L07	Yes	Relate sound transmission to air.	80	2.5	82	3.0	77	3.8
M12	Yes	Complete table of voltage/current data for circuit.	69	3.1	69	4.3	69	3.9
M14	Yes	Draw reflected image of object.	69	3.2	66	4.3	71	4.6
N08	Yes	Relate lever arm lengths to balanced weights.	79	2.4	84	3.0	75	2.9
N10	Yes	Determine effect of tipping container on water surface.	51	3.7	61	5.0	43	4.2
O10	Yes	Identify polarity of ends of cut magnet.	79	2.5	80	3.2	80	3.1
O13	Yes	Relate circular motion to centripetal force.	69	3.5	75	3.7	64	5.0
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	87	2.0	86	3.8	87	2.4
P02	Yes	Explain relationship between illuminance and distance of light source.	11	2.3	17	3.6	7	2.2
P05	Yes	Explain why balloon expands upon heating.	64	3.3	68	4.0	59	4.4
Q12	Yes	Explain how focusing affects the amount of light.	48	2.7	58	4.0	41	3.4
Q13	Yes	Compare heat expansion properties of metal and glass.	80	2.6	85	3.0	76	4.2
Q18	Yes	Explain effect of melting on the mass of ice cubes.	29	2.6	28	4.2	31	3.9
R01	Yes	Choose diagram showing angle of reflected light.	76	2.5	77	3.7	76	3.5
R02	Yes	Identify reflection/absorption properties from color.	39	2.8	34	3.9	42	3.9
Y01	Yes	Explain amount of light/electric energy in a lamp.	11	1.6	14	2.3	8	1.8
Y02	Yes	Explain temperature of melting snowball.	18	1.6	18	2.4	18	2.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Belgium (Fl) SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	88	0.7	89	1.1	86	1.0
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	89	1.5	91	2.3	87	1.8
F06	No	Relate rusting iron to the presence of oxygen and moisture.	72	1.7	75	2.7	69	2.2
G10	No	Select correct statement regarding the atomic makeup of matter.	49	1.8	56	1.8	42	2.7
H06	No	Know if wood-burning reaction absorbs or releases energy.	60	1.8	64	2.8	56	3.0
J03	Yes	Know relationship between molecules, atoms and cells.	19	2.3	22	3.9	17	3.0
J04	Yes	Distiguish between a chemical reaction and a physical change.	36	3.2	32	3.7	39	4.4
J06	Yes	Know what happens to atoms in animal after death.	20	2.5	23	3.9	17	3.4
J08	Yes	Identify gas involved in fire ignition.	47	3.6	48	5.8	46	4.8
M10	Yes	Identify substances which are mixtures.	63	4.9	64	4.4	63	6.8
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	42	3.6	42	4.1	42	5.1
N07	Yes	Explain oxygen fuel requirements of burning candle.	97	1.3	96	2.1	98	1.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	46	2.8	50	3.9	42	5.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	34	3.1	34	4.3	35	4.2
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	20	2.7	27	4.4	14	2.8
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	15	2.2	15	3.0	15	3.3
Q15	Yes	Determine physical processes involving chemical change.	31	3.0	30	4.5	32	4.3
R05	Yes	Explain how carbon dioxide fire extinguishers work.	58	4.1	61	6.1	54	5.0
Z01A	Yes	Explain why steel bridges must be painted.	83	2.5	85	3.8	82	3.0
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	63	3.4	65	4.1	62	6.7
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	42	3.6	40	4.2	43	5.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Belgium (Fl) SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	76	1.9	76	3.2	76	2.3
B01	No	Identify hottest layer of the Earth.	91	1.3	94	1.9	87	1.6
B05	No	Use elevation/weather diagram to locate earth feature.	49	1.6	49	2.5	50	1.7
C07	No	Relate mountain shape to age.	69	2.0	74	3.2	64	2.7
D03	No	Identify direction of river flow on contour map.	52	1.8	58	3.1	47	2.3
E09	No	Use table of time/temperature to determine point when weather changes.	91	1.7	89	2.8	93	1.5
E12	No	Identify type of stone involved in cave formation.	55	2.2	59	2.2	51	3.5
F05	No	Relate level of oxygen to elevation.	89	1.4	89	1.9	89	2.2
G11	No	Identify type of rock from description of its formation.	29	2.4	31	3.2	28	2.6
H03	No	Select explanation for moonlight.	83	1.4	88	2.5	79	1.9
H04	No	Identify ground layer containing the most organic material.	65	2.2	64	4.0	66	2.1
I17	Yes	Know energy source for Earth’s water cycle.	48	3.6	55	4.2	42	4.9
J01	Yes	Know changes in Earth’s surface over billions of years.	56	3.8	54	6.3	57	3.8
K15	Yes	Know organic origins of fossil fuels.	70	3.5	77	3.3	64	5.3
O12	Yes	Know relative amounts of components in air.	17	2.1	16	3.1	18	2.7
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	62	3.5	70	6.0	55	3.5
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	85	2.6	83	3.7	86	3.9
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	48	2.5	56	3.9	39	3.0
Q16	Yes	Estimate time for light from star to reach Earth.	34	2.9	38	4.5	30	3.8
R04	Yes	Give reason why ozone layer is important for life.	47	3.1	51	4.7	44	4.1
W01A	Yes	Give reason region in land/water diagram is a good farming location.	86	1.8	87	3.6	86	2.3
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	57	3.2	58	3.8	56	4.5
W02	Yes	Draw diagram showing Earth’s water cycle.	60	3.4	61	4.3	58	5.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Belgium (Fl) SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	70	2.0	69	3.3	71	2.4
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	47	2.8	55	4.6	39	2.5
F04	No	Predict type of area where soil erosion by rain is most likely.	68	2.2	69	2.9	67	3.9
G12	No	Identify a nonrenewable natural resource.	58	1.7	59	2.5	56	2.4
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	46	3.1	47	4.4	44	3.8
I13	Yes	Select best scale for accurate measurement.	71	2.6	71	3.2	71	4.0
I15	Yes	Identify the type of scientific statement given in an experimental report.	29	2.9	27	3.2	32	4.3
I18	Yes	Write conclusion from summary of experimental observations.	49	3.7	49	4.0	49	6.4
K19	Yes	Write an example of how computers are used to do work.	87	2.6	86	3.4	87	3.5
N01	Yes	Determine correct control experiment to test hypothesis.	47	4.1	49	5.2	45	4.7
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	76	3.4	81	4.0	70	5.7
N05	Yes	Identify a principal cause of acid rain.	30	3.1	41	4.0	17	3.2
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	42	3.4	41	4.6	44	5.3
Z02A	Yes	Write a reason why not all people have enough water.	85	3.6	81	6.7	88	2.4
Z02B	Yes	Write a second reason why not all people have enough water.	60	3.7	55	4.5	66	5.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Belgium (Fl) SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	81	1.9	78	2.4	84	2.4
B04	No	Predict pulse/breathing rate change after exercise.	92	2.0	93	1.7	91	2.8
C08	No	Identify carrier of signals from eye to brain.	86	1.8	87	2.2	85	3.0
D05	No	Identify system carrying sensory messages to the brain.	77	1.9	81	1.8	74	2.8
D06	No	Relate plant part to seed development.	84	1.4	87	2.1	81	1.8
E08	No	Select correct statement of trait heredity from parents.	90	1.8	89	2.8	91	2.1
E10	No	Determine characteristics for classifying animals.	53	1.8	56	2.7	50	2.1
F01	No	Identify characteristic of mammal.	71	2.0	68	3.1	75	2.3
F03	No	Identify human organ which interprets senses.	43	1.7	45	2.5	42	2.3
G08	No	Identify main function of red blood cells.	62	2.8	69	2.6	54	5.3
G09	No	Identify reproductive cells involved in heredity.	85	1.7	80	2.0	90	1.9
H01	No	Identify the functions of blood.	75	1.9	76	2.0	73	3.4
H02	No	Identify the role of vitamins.	87	1.3	85	1.2	89	2.3
I10	Yes	Identify nutrition content of fruits and vegetables.	90	2.1	84	3.9	95	1.6
I11	Yes	Know identifying features of insects.	50	3.5	55	4.8	45	4.6
I14	Yes	Relate elbow action to a simple machine.	64	2.3	63	3.4	65	3.0
I19	Yes	Identify statement of oxygen production consistent with data.	61	4.1	66	5.3	57	6.3
J02	Yes	Choose species on Earth for shortest time.	74	4.3	65	6.9	81	3.4
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	51	2.8	53	3.7	50	4.4
J09	Yes	Explain how to determine the age of a cut tree.	92	2.2	93	3.0	90	3.4
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	64	3.5	65	5.9	64	4.1
K12	Yes	Relate reproductive cell production to population.	54	3.5	55	3.7	53	6.3
K16	Yes	Identify common product made with bacteria.	13	2.1	17	3.2	8	2.5
K18	Yes	Identify main function of chloroplasts in plant cell.	65	4.9	69	4.6	61	8.1
L02	Yes	Select reason why algae are close to ocean surface.	43	3.0	44	4.5	43	3.1
L03	Yes	Identify skull features typical of predators.	64	3.1	62	4.7	66	3.5
L05	Yes	Select most likely purpose for birds' singing.	65	3.0	73	3.6	58	4.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	58	2.2	56	3.2	60	3.2
M11	Yes	Complete a food web showing energy relationships.	76	3.3	76	4.7	75	3.5
N02	Yes	Choose meal which would give the most nutrients.	58	2.7	55	4.6	61	4.1
N04	Yes	Identify how decaying fish fertilize plants.	48	3.1	45	4.1	51	3.8
N06	Yes	Identify the most basic unit of living things.	62	3.3	67	5.4	56	3.9
O16	Yes	Give reason for thirst on a hot day.	74	4.1	73	7.1	75	4.2
O17	Yes	Describe how disease may be transmitted.	46	3.2	41	4.4	50	4.1
P04	Yes	Identify what happens to animals' biological processes during hibernation.	72	3.2	74	5.4	71	3.9
P06	Yes	Describe digestion occuring in the mouth.	57	4.2	59	6.8	55	5.4
Q17	Yes	Describe the advantage of having two eyes.	82	3.8	81	6.3	84	3.7
R03	Yes	Give example of consequences of introducing new species.	16	2.1	13	2.9	18	3.4
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	26	1.7	22	2.5	31	2.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	75	2.5	71	3.0	78	3.7
X02B	Yes	Explain why light is important in aquarium ecosystem.	43	2.1	46	4.2	42	2.5

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Belgium (Fl) SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	73	1.5	72	2.0	74	1.8
A10	No	Relate light level and reflectance to vision of object.	70	1.1	72	1.5	68	1.6
B02	No	Know type of energy released from combustion engine.	53	2.6	57	2.2	48	3.5
B03	No	Determine density from mass/volume table.	44	1.5	46	2.1	41	2.2
B06	No	Relate color of object to amount of light reflection.	95	0.7	96	1.0	95	0.9
C09	No	Identify correct position of reflected image.	85	1.9	87	2.2	83	2.9
C12	No	Identify substance which is NOT a fossil fuel.	71	1.7	71	2.2	71	2.7
D01	No	Identify correct diagram of light rays through lens.	45	2.1	57	3.1	34	2.5
D02	No	Identify substance from magnetic properties.	73	2.8	80	3.3	67	4.0
D04	No	Relate physical event to its sequence of energy changes.	68	3.1	71	4.3	65	4.9
E07	No	Identify particles found in the nucleus of atoms.	28	2.0	30	2.9	26	2.6
E11	No	Find shadow size from diagram of bulb/card/screen distances.	67	1.3	68	2.2	65	1.7
F02	No	Relate color and light reflection to temperature of object.	85	1.1	88	1.7	83	1.7
G07	No	Identify correct way to place batteries in a flashlight.	88	1.3	89	2.0	86	1.3
H05	No	Identify source of energy stored in food.	16	1.6	16	1.9	16	2.3
I16	Yes	Identify material with greatest heat conductivity.	88	1.8	90	2.1	87	2.5
J05	Yes	Identify type of solar radiation that causes sunburn.	63	2.4	66	5.7	60	3.0
K10	Yes	Describe a method demonstrating the existence of air.	44	2.4	44	3.6	45	3.0
K13	Yes	Identify electrical conductors that form complete circuits.	87	2.8	91	2.5	82	4.2
K14	Yes	Relate evaporation rate to surface area.	86	2.2	88	3.4	84	3.1
K17	Yes	Relate presence of gravitational force to position of falling object.	62	2.3	67	3.4	57	3.2
L01	Yes	Select diagram showing forces resulting in rotation.	53	3.0	53	5.6	53	2.9
L04	Yes	Explain most efficient engine.	49	2.3	46	4.3	51	3.1
L07	Yes	Relate sound transmission to air.	62	3.3	72	4.2	51	4.8
M12	Yes	Complete table of voltage/current data for circuit.	74	2.4	79	3.8	68	3.8
M14	Yes	Draw reflected image of object.	76	5.5	78	4.6	73	7.5
N08	Yes	Relate lever arm lengths to balanced weights.	75	3.8	80	6.4	69	3.8
N10	Yes	Determine effect of tipping container on water surface.	60	4.2	69	6.6	50	5.3
O10	Yes	Identify polarity of ends of cut magnet.	64	2.7	64	3.2	65	4.4
O13	Yes	Relate circular motion to centripetal force.	60	3.7	64	6.1	57	4.7
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	84	5.2	84	7.3	83	7.2
P02	Yes	Explain relationship between illuminance and distance of light source.	31	3.1	34	4.8	28	3.8
P05	Yes	Explain why balloon expands upon heating.	61	3.6	64	4.7	57	5.0
Q12	Yes	Explain how focusing affects the amount of light.	54	3.2	52	5.4	56	3.3
Q13	Yes	Compare heat expansion properties of metal and glass.	80	3.4	79	5.6	81	3.2
Q18	Yes	Explain effect of melting on the mass of ice cubes.	28	2.9	31	3.7	26	4.2
R01	Yes	Choose diagram showing angle of reflected light.	74	2.4	76	3.0	72	3.7
R02	Yes	Identify reflection/absorption properties from color.	46	2.4	49	3.0	43	4.1
Y01	Yes	Explain amount of light/electric energy in a lamp.	19	2.0	21	2.7	15	2.4
Y02	Yes	Explain temperature of melting snowball.	21	1.9	18	2.2	23	3.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Belgium (Fr) SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	76	1.2	82	1.5	71	1.7
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	82	1.5	82	2.2	81	1.9
F06	No	Relate rusting iron to the presence of oxygen and moisture.	67	1.9	69	2.7	66	3.0
G10	No	Select correct statement regarding the atomic makeup of matter.	44	2.0	46	2.7	42	3.0
H06	No	Know if wood-burning reaction absorbs or releases energy.	49	1.8	56	3.0	42	2.5
J03	Yes	Know relationship between molecules, atoms and cells.	20	2.8	20	3.9	21	3.5
J04	Yes	Distiguish between a chemical reaction and a physical change.	33	3.4	33	4.3	34	4.5
J06	Yes	Know what happens to atoms in animal after death.	13	2.4	17	3.5	8	2.5
J08	Yes	Identify gas involved in fire ignition.	20	2.8	19	3.2	21	5.0
M10	Yes	Identify substances which are mixtures.	53	3.1	55	4.5	52	4.5
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	52	3.9	55	4.6	49	6.4
N07	Yes	Explain oxygen fuel requirements of burning candle.	84	2.5	88	3.0	81	4.5
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	36	3.0	41	4.5	31	3.9
O11	Yes	Identify which change in elemental form is due to a chemical change.	34	2.7	31	3.4	38	4.2
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	25	4.6	31	8.2	17	3.4
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	19	2.4	19	3.1	18	3.5
Q15	Yes	Determine physical processes involving chemical change.	13	1.9	12	2.4	14	2.8
R05	Yes	Explain how carbon dioxide fire extinguishers work.	33	3.5	39	4.8	26	4.1
Z01A	Yes	Explain why steel bridges must be painted.	51	3.0	56	4.5	47	4.3
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	40	3.1	41	4.8	41	3.7
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	24	2.4	26	4.3	22	3.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Belgium (Fr) SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	50	1.3	53	1.7	48	1.9
B01	No	Identify hottest layer of the Earth.	82	1.2	85	1.9	79	1.8
B05	No	Use elevation/weather diagram to locate earth feature.	44	2.0	45	2.6	43	2.6
C07	No	Relate mountain shape to age.	44	2.5	46	3.2	42	3.2
D03	No	Identify direction of river flow on contour map.	42	2.0	45	3.0	41	2.0
E09	No	Use table of time/temperature to determine point when weather changes.	89	1.1	88	1.9	90	1.4
E12	No	Identify type of stone involved in cave formation.	60	2.2	60	2.8	60	3.0
F05	No	Relate level of oxygen to elevation.	79	1.7	83	2.5	76	2.1
G11	No	Identify type of rock from description of its formation.	29	1.7	33	2.5	26	2.3
H03	No	Select explanation for moonlight.	68	2.2	75	3.1	63	2.4
H04	No	Identify ground layer containing the most organic material.	58	2.0	62	2.4	54	3.3
I17	Yes	Know energy source for Earth’s water cycle.	41	2.8	45	4.4	35	3.3
J01	Yes	Know changes in Earth’s surface over billions of years.	45	3.5	44	3.9	46	5.0
K15	Yes	Know organic origins of fossil fuels.	47	3.2	48	4.9	46	4.7
O12	Yes	Know relative amounts of components in air.	20	4.5	28	8.3	11	2.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	58	4.1	66	6.6	49	4.0
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	78	2.6	72	4.0	86	2.7
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	25	2.5	28	4.3	21	3.7
Q16	Yes	Estimate time for light from star to reach Earth.	17	2.2	20	2.9	13	3.3
R04	Yes	Give reason why ozone layer is important for life.	48	3.5	50	4.3	47	4.5
W01A	Yes	Give reason region in land/water diagram is a good farming location.	62	2.8	63	4.2	60	2.8
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	34	2.3	32	2.9	36	3.1
W02	Yes	Draw diagram showing Earth’s water cycle.	32	2.0	36	2.7	28	2.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Belgium (Fr) SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	35	1.2	39	1.6	31	1.4
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	40	1.8	45	2.1	35	2.4
F04	No	Predict type of area where soil erosion by rain is most likely.	49	1.7	54	2.6	46	2.4
G12	No	Identify a nonrenewable natural resource.	37	1.4	39	1.8	36	2.3
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	41	2.9	44	3.8	39	4.3
I13	Yes	Select best scale for accurate measurement.	75	2.6	74	4.0	77	3.8
I15	Yes	Identify the type of scientific statement given in an experimental report.	56	2.7	54	3.9	60	4.1
I18	Yes	Write conclusion from summary of experimental observations.	26	3.1	25	4.3	26	4.6
K19	Yes	Write an example of how computers are used to do work.	68	3.0	66	3.7	69	4.0
N01	Yes	Determine correct control experiment to test hypothesis.	40	2.9	38	3.8	42	3.8
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	77	3.2	77	4.1	79	4.1
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	45	2.9	43	4.4	47	3.8
Z02A	Yes	Write a reason why not all people have enough water.	45	2.9	50	4.6	41	4.0
Z02B	Yes	Write a second reason why not all people have enough water.	30	3.2	29	5.2	32	3.3

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Belgium (Fr) SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	45	1.6	44	2.2	46	1.6
B04	No	Predict pulse/breathing rate change after exercise.	90	1.1	88	1.8	91	1.1
C08	No	Identify carrier of signals from eye to brain.	73	2.0	75	2.9	72	2.4
D05	No	Identify system carrying sensory messages to the brain.	66	1.8	68	2.6	64	3.0
D06	No	Relate plant part to seed development.	71	2.3	71	3.1	71	3.2
E08	No	Select correct statement of trait heredity from parents.	68	1.7	66	2.9	71	2.2
E10	No	Determine characteristics for classifying animals.	59	2.0	58	3.0	59	3.1
F01	No	Identify characteristic of mammal.	59	2.1	59	3.1	59	2.6
F03	No	Identify human organ which interprets senses.	74	2.1	68	3.1	79	2.1
G08	No	Identify main function of red blood cells.	62	1.7	68	2.3	57	2.5
G09	No	Identify reproductive cells involved in heredity.	76	1.3	73	2.6	79	1.8
H01	No	Identify the functions of blood.	67	1.6	68	2.5	67	2.3
H02	No	Identify the role of vitamins.	68	1.7	68	3.1	68	2.7
I10	Yes	Identify nutrition content of fruits and vegetables.	68	3.2	67	4.3	70	5.2
I11	Yes	Know identifying features of insects.	53	3.2	59	4.3	47	4.4
I14	Yes	Relate elbow action to a simple machine.	69	2.9	67	4.3	72	4.0
I19	Yes	Identify statement of oxygen production consistent with data.	57	2.6	59	4.2	56	4.5
J02	Yes	Choose species on Earth for shortest time.	73	2.4	78	3.1	67	3.2
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	55	3.1	53	3.5	58	4.7
J09	Yes	Explain how to determine the age of a cut tree.	63	3.5	65	3.8	62	5.4
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	46	3.6	54	4.6	41	5.0
K12	Yes	Relate reproductive cell production to population.	55	4.2	54	4.2	56	6.0
K16	Yes	Identify common product made with bacteria.	24	2.9	25	3.7	23	4.4
K18	Yes	Identify main function of chloroplasts in plant cell.	49	3.2	53	4.7	46	4.6
L02	Yes	Select reason why algae are close to ocean surface.	59	3.5	63	4.3	56	4.2
L03	Yes	Identify skull features typical of predators.	80	3.0	84	3.3	78	4.4
L05	Yes	Select most likely purpose for birds' singing.	76	2.2	78	3.8	74	3.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	57	3.7	50	5.3	64	3.9
M11	Yes	Complete a food web showing energy relationships.	55	3.1	57	4.3	54	4.8
N02	Yes	Choose meal which would give the most nutrients.	45	3.0	40	5.2	50	3.9
N04	Yes	Identify how decaying fish fertilize plants.	46	2.7	49	3.9	43	3.3
N06	Yes	Identify the most basic unit of living things.	46	3.1	47	4.2	45	4.5
O16	Yes	Give reason for thirst on a hot day.	63	3.5	63	5.2	64	4.2
O17	Yes	Describe how disease may be transmitted.	49	4.3	44	8.1	55	3.8
P04	Yes	Identify what happens to animals' biological processes during hibernation.	60	3.2	61	5.5	58	3.7
P06	Yes	Describe digestion occuring in the mouth.	31	2.7	32	3.6	28	3.9
Q17	Yes	Describe the advantage of having two eyes.	62	4.0	56	5.4	68	4.6
R03	Yes	Give example of consequences of introducing new species.	4	1.4	5	2.2	3	1.4
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	13	1.4	13	2.2	14	2.0
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	47	2.4	49	3.5	47	2.9
X02B	Yes	Explain why light is important in aquarium ecosystem.	27	2.2	30	3.3	24	2.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Belgium (Fr) SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	62	1.5	62	1.8	62	1.9
A10	No	Relate light level and reflectance to vision of object.	59	1.1	62	1.8	57	1.3
B02	No	Know type of energy released from combustion engine.	51	2.2	50	2.9	53	3.3
B03	No	Determine density from mass/volume table.	19	1.4	21	2.2	16	1.8
B06	No	Relate color of object to amount of light reflection.	88	1.6	88	2.2	89	2.0
C09	No	Identify correct position of reflected image.	82	1.5	84	1.7	80	1.9
C12	No	Identify substance which is NOT a fossil fuel.	27	1.6	27	2.1	28	2.3
D01	No	Identify correct diagram of light rays through lens.	32	2.1	40	3.0	24	2.3
D02	No	Identify substance from magnetic properties.	71	1.8	74	2.5	69	2.2
D04	No	Relate physical event to its sequence of energy changes.	45	2.1	49	3.8	40	2.1
E07	No	Identify particles found in the nucleus of atoms.	25	1.5	29	2.6	21	1.7
E11	No	Find shadow size from diagram of bulb/card/screen distances.	56	1.5	61	2.7	52	1.9
F02	No	Relate color and light reflection to temperature of object.	61	1.7	65	2.3	58	2.1
G07	No	Identify correct way to place batteries in a flashlight.	84	1.2	85	2.0	83	1.4
H05	No	Identify source of energy stored in food.	8	1.1	7	1.4	9	1.5
I16	Yes	Identify material with greatest heat conductivity.	81	2.6	85	2.7	78	4.9
J05	Yes	Identify type of solar radiation that causes sunburn.	62	2.9	63	3.7	61	4.4
K10	Yes	Describe a method demonstrating the existence of air.	29	2.8	28	4.0	30	3.5
K13	Yes	Identify electrical conductors that form complete circuits.	62	3.0	71	4.1	55	3.5
K14	Yes	Relate evaporation rate to surface area.	81	3.0	83	3.8	80	4.4
K17	Yes	Relate presence of gravitational force to position of falling object.	52	3.3	55	3.9	50	5.2
L01	Yes	Select diagram showing forces resulting in rotation.	47	3.1	51	4.2	45	4.0
L04	Yes	Explain most efficient engine.	41	3.2	43	4.8	40	3.9
L07	Yes	Relate sound transmission to air.	74	2.6	74	4.0	75	3.9
M12	Yes	Complete table of voltage/current data for circuit.	64	3.1	69	4.1	58	4.4
M14	Yes	Draw reflected image of object.	76	3.0	80	4.1	73	5.5
N08	Yes	Relate lever arm lengths to balanced weights.	69	2.9	76	4.1	61	4.7
N10	Yes	Determine effect of tipping container on water surface.	64	2.6	75	3.6	55	3.7
O10	Yes	Identify polarity of ends of cut magnet.	39	4.2	45	6.9	32	4.9
O13	Yes	Relate circular motion to centripetal force.	67	4.2	72	6.6	60	4.0
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	86	2.6	85	3.8	86	3.3
P02	Yes	Explain relationship between illuminance and distance of light source.	15	2.2	14	2.5	17	3.2
P05	Yes	Explain why balloon expands upon heating.	53	3.5	55	5.2	52	3.9
Q12	Yes	Explain how focusing affects the amount of light.	39	3.9	41	4.8	37	5.0
Q13	Yes	Compare heat expansion properties of metal and glass.	46	3.1	44	3.9	48	4.7
Q18	Yes	Explain effect of melting on the mass of ice cubes.	29	2.6	27	3.8	32	3.5
R01	Yes	Choose diagram showing angle of reflected light.	70	3.3	67	4.9	74	4.7
R02	Yes	Identify reflection/absorption properties from color.	38	2.9	40	4.2	36	4.8
Y01	Yes	Explain amount of light/electric energy in a lamp.	3	0.5	2	0.6	4	0.8
Y02	Yes	Explain temperature of melting snowball.	16	1.8	12	2.0	20	2.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Bulgaria SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	91	0.9	.	.	.	.
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	92	1.2	.	.	.	.
F06	No	Relate rusting iron to the presence of oxygen and moisture.	81	2.7	.	.	.	.
G10	No	Select correct statement regarding the atomic makeup of matter.	69	3.3	.	.	.	.
H06	No	Know if wood-burning reaction absorbs or releases energy.	65	2.5	.	.	.	.
J03	Yes	Know relationship between molecules, atoms and cells.	68	4.7	.	.	.	.
J04	Yes	Distiguish between a chemical reaction and a physical change.	67	5.4	.	.	.	.
J06	Yes	Know what happens to atoms in animal after death.	49	5.6	.	.	.	.
J08	Yes	Identify gas involved in fire ignition.	77	3.7	.	.	.	.
M10	Yes	Identify substances which are mixtures.	61	8.2	.	.	.	.
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	67	6.2	.	.	.	.
N07	Yes	Explain oxygen fuel requirements of burning candle.	92	2.5	.	.	.	.
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	73	4.0	.	.	.	.
O11	Yes	Identify which change in elemental form is due to a chemical change.	59	4.7	.	.	.	.
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	70	4.4	.	.	.	.
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	60	3.8	.	.	.	.
Q15	Yes	Determine physical processes involving chemical change.	33	4.1	.	.	.	.
R05	Yes	Explain how carbon dioxide fire extinguishers work.	46	4.0	.	.	.	.
Z01A	Yes	Explain why steel bridges must be painted.	52	9.3	.	.	.	.
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	53	6.2	.	.	.	.
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	50	5.1	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Bulgaria SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	71	1.9	.	.	.	.
B01	No	Identify hottest layer of the Earth.	95	0.8	.	.	.	.
B05	No	Use elevation/weather diagram to locate earth feature.	54	2.9	.	.	.	.
C07	No	Relate mountain shape to age.	50	2.7	.	.	.	.
D03	No	Identify direction of river flow on contour map.	52	2.9	.	.	.	.
E09	No	Use table of time/temperature to determine point when weather changes.	81	2.1	.	.	.	.
E12	No	Identify type of stone involved in cave formation.	69	2.5	.	.	.	.
F05	No	Relate level of oxygen to elevation.	92	1.8	.	.	.	.
G11	No	Identify type of rock from description of its formation.	50	3.6	.	.	.	.
H03	No	Select explanation for moonlight.	86	1.7	.	.	.	.
H04	No	Identify ground layer containing the most organic material.	73	2.3	.	.	.	.
I17	Yes	Know energy source for Earth’s water cycle.	39	4.1	.	.	.	.
J01	Yes	Know changes in Earth’s surface over billions of years.	29	7.0	.	.	.	.
K15	Yes	Know organic origins of fossil fuels.	68	3.8	.	.	.	.
O12	Yes	Know relative amounts of components in air.	45	5.1	.	.	.	.
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	50	5.4	.	.	.	.
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	71	3.0	.	.	.	.
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	58	3.5	.	.	.	.
Q16	Yes	Estimate time for light from star to reach Earth.	23	4.3	.	.	.	.
R04	Yes	Give reason why ozone layer is important for life.	67	3.7	.	.	.	.
W01A	Yes	Give reason region in land/water diagram is a good farming location.	65	3.9	.	.	.	.
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	36	3.5	.	.	.	.
W02	Yes	Draw diagram showing Earth’s water cycle.	19	2.8	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Bulgaria SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	76	1.5	.	.	.	.
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	60	2.2	.	.	.	.
F04	No	Predict type of area where soil erosion by rain is most likely.	70	3.6	.	.	.	.
G12	No	Identify a nonrenewable natural resource.	72	2.5	.	.	.	.
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	35	4.1	.	.	.	.
I13	Yes	Select best scale for accurate measurement.	64	3.5	.	.	.	.
I15	Yes	Identify the type of scientific statement given in an experimental report.	45	4.5	.	.	.	.
I18	Yes	Write conclusion from summary of experimental observations.	39	5.0	.	.	.	.
K19	Yes	Write an example of how computers are used to do work.	56	3.8	.	.	.	.
N01	Yes	Determine correct control experiment to test hypothesis.	71	3.7	.	.	.	.
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	84	2.8	.	.	.	.
N05	Yes	Identify a principal cause of acid rain.	47	4.5	.	.	.	.
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	56	4.4	.	.	.	.
Z02A	Yes	Write a reason why not all people have enough water.	63	4.5	.	.	.	.
Z02B	Yes	Write a second reason why not all people have enough water.	53	4.5	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Bulgaria SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	84	1.6	.	.	.	.
B04	No	Predict pulse/breathing rate change after exercise.	93	0.8	.	.	.	.
C08	No	Identify carrier of signals from eye to brain.	85	1.9	.	.	.	.
D05	No	Identify system carrying sensory messages to the brain.	79	1.8	.	.	.	.
D06	No	Relate plant part to seed development.	80	1.8	.	.	.	.
E08	No	Select correct statement of trait heredity from parents.	85	1.8	.	.	.	.
E10	No	Determine characteristics for classifying animals.	53	3.1	.	.	.	.
F01	No	Identify characteristic of mammal.	86	2.1	.	.	.	.
F03	No	Identify human organ which interprets senses.	91	1.5	.	.	.	.
G08	No	Identify main function of red blood cells.	72	2.3	.	.	.	.
G09	No	Identify reproductive cells involved in heredity.	87	1.6	.	.	.	.
H01	No	Identify the functions of blood.	83	2.0	.	.	.	.
H02	No	Identify the role of vitamins.	90	1.6	.	.	.	.
I10	Yes	Identify nutrition content of fruits and vegetables.	84	2.3	.	.	.	.
I11	Yes	Know identifying features of insects.	42	4.3	.	.	.	.
I14	Yes	Relate elbow action to a simple machine.	46	4.3	.	.	.	.
I19	Yes	Identify statement of oxygen production consistent with data.	50	4.3	.	.	.	.
J02	Yes	Choose species on Earth for shortest time.	70	6.4	.	.	.	.
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	69	5.1	.	.	.	.
J09	Yes	Explain how to determine the age of a cut tree.	87	2.7	.	.	.	.
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	60	4.0	.	.	.	.
K12	Yes	Relate reproductive cell production to population.	40	4.7	.	.	.	.
K16	Yes	Identify common product made with bacteria.	57	4.5	.	.	.	.
K18	Yes	Identify main function of chloroplasts in plant cell.	58	4.2	.	.	.	.
L02	Yes	Select reason why algae are close to ocean surface.	69	4.6	.	.	.	.
L03	Yes	Identify skull features typical of predators.	81	3.6	.	.	.	.
L05	Yes	Select most likely purpose for birds' singing.	69	5.2	.	.	.	.
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	77	5.8	.	.	.	.
M11	Yes	Complete a food web showing energy relationships.	42	8.5	.	.	.	.
N02	Yes	Choose meal which would give the most nutrients.	56	5.2	.	.	.	.
N04	Yes	Identify how decaying fish fertilize plants.	63	5.4	.	.	.	.
N06	Yes	Identify the most basic unit of living things.	84	2.5	.	.	.	.
O16	Yes	Give reason for thirst on a hot day.	59	4.3	.	.	.	.
O17	Yes	Describe how disease may be transmitted.	50	4.7	.	.	.	.
P04	Yes	Identify what happens to animals' biological processes during hibernation.	71	3.3	.	.	.	.
P06	Yes	Describe digestion occuring in the mouth.	38	3.8	.	.	.	.
Q17	Yes	Describe the advantage of having two eyes.	67	3.5	.	.	.	.
R03	Yes	Give example of consequences of introducing new species.	9	1.9	.	.	.	.
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	7	2.6	.	.	.	.
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	66	4.5	.	.	.	.
X02B	Yes	Explain why light is important in aquarium ecosystem.	55	4.7	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Bulgaria SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	61	2.2	.	.	.	.
A10	No	Relate light level and reflectance to vision of object.	64	2.2	.	.	.	.
B02	No	Know type of energy released from combustion engine.	73	2.4	.	.	.	.
B03	No	Determine density from mass/volume table.	49	4.4	.	.	.	.
B06	No	Relate color of object to amount of light reflection.	86	1.2	.	.	.	.
C09	No	Identify correct position of reflected image.	75	2.4	.	.	.	.
C12	No	Identify substance which is NOT a fossil fuel.	88	1.6	.	.	.	.
D01	No	Identify correct diagram of light rays through lens.	67	2.6	.	.	.	.
D02	No	Identify substance from magnetic properties.	86	1.6	.	.	.	.
D04	No	Relate physical event to its sequence of energy changes.	56	3.0	.	.	.	.
E07	No	Identify particles found in the nucleus of atoms.	56	3.7	.	.	.	.
E11	No	Find shadow size from diagram of bulb/card/screen distances.	58	2.4	.	.	.	.
F02	No	Relate color and light reflection to temperature of object.	82	2.6	.	.	.	.
G07	No	Identify correct way to place batteries in a flashlight.	94	1.1	.	.	.	.
H05	No	Identify source of energy stored in food.	38	3.2	.	.	.	.
I16	Yes	Identify material with greatest heat conductivity.	84	2.8	.	.	.	.
J05	Yes	Identify type of solar radiation that causes sunburn.	80	4.0	.	.	.	.
K10	Yes	Describe a method demonstrating the existence of air.	32	3.5	.	.	.	.
K13	Yes	Identify electrical conductors that form complete circuits.	75	3.1	.	.	.	.
K14	Yes	Relate evaporation rate to surface area.	87	2.4	.	.	.	.
K17	Yes	Relate presence of gravitational force to position of falling object.	41	5.0	.	.	.	.
L01	Yes	Select diagram showing forces resulting in rotation.	66	4.5	.	.	.	.
L04	Yes	Explain most efficient engine.	19	3.3	.	.	.	.
L07	Yes	Relate sound transmission to air.	74	4.4	.	.	.	.
M12	Yes	Complete table of voltage/current data for circuit.	52	5.4	.	.	.	.
M14	Yes	Draw reflected image of object.	60	5.0	.	.	.	.
N08	Yes	Relate lever arm lengths to balanced weights.	81	3.7	.	.	.	.
N10	Yes	Determine effect of tipping container on water surface.	66	4.6	.	.	.	.
O10	Yes	Identify polarity of ends of cut magnet.	63	3.7	.	.	.	.
O13	Yes	Relate circular motion to centripetal force.	57	5.5	.	.	.	.
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	78	2.5	.	.	.	.
P02	Yes	Explain relationship between illuminance and distance of light source.	29	3.6	.	.	.	.
P05	Yes	Explain why balloon expands upon heating.	68	3.1	.	.	.	.
Q12	Yes	Explain how focusing affects the amount of light.	51	4.5	.	.	.	.
Q13	Yes	Compare heat expansion properties of metal and glass.	70	3.7	.	.	.	.
Q18	Yes	Explain effect of melting on the mass of ice cubes.	14	2.7	.	.	.	.
R01	Yes	Choose diagram showing angle of reflected light.	87	1.9	.	.	.	.
R02	Yes	Identify reflection/absorption properties from color.	49	5.2	.	.	.	.
Y01	Yes	Explain amount of light/electric energy in a lamp.	13	2.0	.	.	.	.
Y02	Yes	Explain temperature of melting snowball.	11	2.0	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Canada SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	85	0.8	87	0.9	84	1.1
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	83	1.0	81	1.2	84	1.2
F06	No	Relate rusting iron to the presence of oxygen and moisture.	69	1.2	68	1.8	70	1.8
G10	No	Select correct statement regarding the atomic makeup of matter.	57	1.3	60	1.8	53	1.8
H06	No	Know if wood-burning reaction absorbs or releases energy.	63	1.4	70	2.3	56	1.9
J03	Yes	Know relationship between molecules, atoms and cells.	24	1.6	25	2.7	22	2.3
J04	Yes	Distiguish between a chemical reaction and a physical change.	53	2.9	51	4.1	54	3.6
J06	Yes	Know what happens to atoms in animal after death.	41	2.4	41	3.1	40	2.8
J08	Yes	Identify gas involved in fire ignition.	32	1.9	31	2.8	33	2.8
M10	Yes	Identify substances which are mixtures.	64	2.3	68	2.6	61	3.4
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	53	2.9	53	3.8	55	3.3
N07	Yes	Explain oxygen fuel requirements of burning candle.	93	1.2	93	2.0	93	1.4
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	51	2.9	53	3.6	51	3.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	42	2.2	43	3.1	40	3.8
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	25	2.1	25	2.8	25	3.2
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	28	2.3	31	3.5	24	2.4
Q15	Yes	Determine physical processes involving chemical change.	38	2.6	36	3.8	41	3.2
R05	Yes	Explain how carbon dioxide fire extinguishers work.	61	2.0	65	3.2	57	3.1
Z01A	Yes	Explain why steel bridges must be painted.	64	2.5	69	3.4	58	3.4
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	39	2.4	43	3.5	34	3.2
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	24	2.2	28	3.1	20	3.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Canada SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	54	1.0	55	1.4	55	1.3
B01	No	Identify hottest layer of the Earth.	91	0.9	93	1.0	88	1.2
B05	No	Use elevation/weather diagram to locate earth feature.	52	1.4	53	1.8	52	1.9
C07	No	Relate mountain shape to age.	37	1.7	42	1.9	33	2.5
D03	No	Identify direction of river flow on contour map.	43	1.5	47	1.9	38	2.6
E09	No	Use table of time/temperature to determine point when weather changes.	78	1.3	77	1.7	79	1.6
E12	No	Identify type of stone involved in cave formation.	41	1.3	44	1.9	38	1.7
F05	No	Relate level of oxygen to elevation.	91	0.7	90	1.0	91	1.1
G11	No	Identify type of rock from description of its formation.	56	1.5	58	2.0	56	2.0
H03	No	Select explanation for moonlight.	82	1.2	86	1.4	78	1.5
H04	No	Identify ground layer containing the most organic material.	45	1.7	49	2.3	41	2.1
I17	Yes	Know energy source for Earth’s water cycle.	54	2.4	53	3.2	56	2.5
J01	Yes	Know changes in Earth’s surface over billions of years.	46	2.2	43	3.1	49	3.5
K15	Yes	Know organic origins of fossil fuels.	69	2.4	69	3.2	69	3.4
O12	Yes	Know relative amounts of components in air.	21	2.0	22	3.1	20	2.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	67	2.0	74	2.8	61	3.1
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	89	1.2	87	2.1	92	1.7
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	37	2.4	44	3.5	30	3.6
Q16	Yes	Estimate time for light from star to reach Earth.	28	2.2	31	3.1	24	3.5
R04	Yes	Give reason why ozone layer is important for life.	63	2.2	62	3.1	65	3.3
W01A	Yes	Give reason region in land/water diagram is a good farming location.	88	1.1	86	1.4	90	1.7
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	47	1.8	49	2.4	44	2.4
W02	Yes	Draw diagram showing Earth’s water cycle.	39	1.7	41	2.7	38	2.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Canada SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	59	1.1	63	1.4	57	1.4
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	55	1.9	62	2.4	49	2.0
F04	No	Predict type of area where soil erosion by rain is most likely.	73	1.3	73	1.9	74	1.8
G12	No	Identify a nonrenewable natural resource.	65	1.5	69	1.8	61	1.8
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	38	2.5	41	3.0	35	3.6
I13	Yes	Select best scale for accurate measurement.	50	2.4	57	3.6	45	2.8
I15	Yes	Identify the type of scientific statement given in an experimental report.	69	2.8	71	3.5	69	3.9
I18	Yes	Write conclusion from summary of experimental observations.	47	2.1	41	3.2	54	2.8
K19	Yes	Write an example of how computers are used to do work.	92	1.1	92	1.6	93	1.7
N01	Yes	Determine correct control experiment to test hypothesis.	50	2.1	50	2.8	51	3.0
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	78	1.8	77	2.5	80	2.1
N05	Yes	Identify a principal cause of acid rain.	31	2.3	35	3.5	27	3.1
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	58	2.0	58	3.4	59	3.1
Z02A	Yes	Write a reason why not all people have enough water.	80	1.6	77	2.6	83	2.0
Z02B	Yes	Write a second reason why not all people have enough water.	62	2.2	60	2.2	65	3.2

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Canada SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	69	1.4	67	1.4	71	1.8
B04	No	Predict pulse/breathing rate change after exercise.	94	0.6	93	0.8	95	0.7
C08	No	Identify carrier of signals from eye to brain.	65	1.2	67	1.9	64	1.9
D05	No	Identify system carrying sensory messages to the brain.	65	1.3	66	1.6	65	1.8
D06	No	Relate plant part to seed development.	56	1.5	57	2.2	55	1.7
E08	No	Select correct statement of trait heredity from parents.	87	0.9	85	1.6	89	1.2
E10	No	Determine characteristics for classifying animals.	61	1.6	64	2.1	59	2.1
F01	No	Identify characteristic of mammal.	62	1.4	62	2.0	62	2.2
F03	No	Identify human organ which interprets senses.	80	0.9	79	1.2	82	1.7
G08	No	Identify main function of red blood cells.	62	1.3	66	1.9	59	2.1
G09	No	Identify reproductive cells involved in heredity.	82	1.3	79	1.6	85	1.6
H01	No	Identify the functions of blood.	77	1.2	78	1.6	77	1.7
H02	No	Identify the role of vitamins.	78	1.0	76	1.7	80	1.3
I10	Yes	Identify nutrition content of fruits and vegetables.	68	2.4	66	3.5	71	3.1
I11	Yes	Know identifying features of insects.	49	2.3	54	3.6	45	2.8
I14	Yes	Relate elbow action to a simple machine.	59	2.5	58	3.9	62	2.9
I19	Yes	Identify statement of oxygen production consistent with data.	56	2.0	55	3.4	57	2.5
J02	Yes	Choose species on Earth for shortest time.	75	2.3	74	4.0	75	2.7
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	57	2.7	50	4.4	62	3.1
J09	Yes	Explain how to determine the age of a cut tree.	86	1.7	86	1.8	86	2.1
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	60	2.4	64	3.2	56	3.1
K12	Yes	Relate reproductive cell production to population.	62	1.6	60	2.8	64	2.7
K16	Yes	Identify common product made with bacteria.	47	2.0	49	3.1	47	3.6
K18	Yes	Identify main function of chloroplasts in plant cell.	50	1.9	53	2.8	47	3.1
L02	Yes	Select reason why algae are close to ocean surface.	49	2.7	47	3.5	50	4.5
L03	Yes	Identify skull features typical of predators.	77	1.7	78	2.6	76	2.3
L05	Yes	Select most likely purpose for birds' singing.	67	1.9	66	2.5	69	3.0
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	68	1.7	69	2.9	67	2.4
M11	Yes	Complete a food web showing energy relationships.	80	1.8	81	2.7	79	2.5
N02	Yes	Choose meal which would give the most nutrients.	66	2.2	59	2.9	73	3.2
N04	Yes	Identify how decaying fish fertilize plants.	52	3.0	50	3.4	54	4.0
N06	Yes	Identify the most basic unit of living things.	68	2.5	68	3.6	68	3.1
O16	Yes	Give reason for thirst on a hot day.	58	2.4	58	3.1	58	3.4
O17	Yes	Describe how disease may be transmitted.	57	2.8	54	3.6	59	3.7
P04	Yes	Identify what happens to animals' biological processes during hibernation.	59	2.5	63	3.0	57	3.4
P06	Yes	Describe digestion occuring in the mouth.	47	2.7	47	3.7	47	3.4
Q17	Yes	Describe the advantage of having two eyes.	70	2.7	69	2.7	69	4.0
R03	Yes	Give example of consequences of introducing new species.	20	2.0	20	2.8	20	2.6
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	21	1.6	16	1.6	26	2.4
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	62	1.6	64	2.9	60	2.3
X02B	Yes	Explain why light is important in aquarium ecosystem.	26	1.5	27	2.8	24	2.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Canada SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	75	0.8	75	1.1	75	1.0
A10	No	Relate light level and reflectance to vision of object.	73	0.8	73	1.1	72	1.0
B02	No	Know type of energy released from combustion engine.	63	1.2	62	1.8	64	1.7
B03	No	Determine density from mass/volume table.	27	1.4	30	1.6	25	2.1
B06	No	Relate color of object to amount of light reflection.	80	1.0	82	1.2	79	1.6
C09	No	Identify correct position of reflected image.	76	1.4	78	1.8	74	1.9
C12	No	Identify substance which is NOT a fossil fuel.	63	1.4	66	2.0	60	2.4
D01	No	Identify correct diagram of light rays through lens.	44	1.6	54	2.1	34	1.8
D02	No	Identify substance from magnetic properties.	79	1.0	80	1.4	79	1.4
D04	No	Relate physical event to its sequence of energy changes.	58	1.7	61	2.6	55	2.2
E07	No	Identify particles found in the nucleus of atoms.	38	1.4	38	2.1	37	1.9
E11	No	Find shadow size from diagram of bulb/card/screen distances.	57	1.6	57	2.3	57	2.0
F02	No	Relate color and light reflection to temperature of object.	68	1.6	69	1.6	66	2.5
G07	No	Identify correct way to place batteries in a flashlight.	90	0.7	91	1.2	88	1.1
H05	No	Identify source of energy stored in food.	22	1.4	25	2.3	19	1.7
I16	Yes	Identify material with greatest heat conductivity.	90	1.4	89	2.1	92	1.6
J05	Yes	Identify type of solar radiation that causes sunburn.	78	2.2	79	3.2	78	2.2
K10	Yes	Describe a method demonstrating the existence of air.	43	2.4	40	3.4	47	2.8
K13	Yes	Identify electrical conductors that form complete circuits.	79	1.9	86	2.3	73	2.8
K14	Yes	Relate evaporation rate to surface area.	85	2.0	83	2.8	86	2.4
K17	Yes	Relate presence of gravitational force to position of falling object.	63	2.7	64	3.2	61	4.4
L01	Yes	Select diagram showing forces resulting in rotation.	53	2.4	54	3.4	53	2.9
L04	Yes	Explain most efficient engine.	49	2.2	51	3.7	48	3.3
L07	Yes	Relate sound transmission to air.	72	1.7	75	2.2	70	2.8
M12	Yes	Complete table of voltage/current data for circuit.	52	2.2	59	2.7	44	3.3
M14	Yes	Draw reflected image of object.	75	1.9	76	2.9	75	2.9
N08	Yes	Relate lever arm lengths to balanced weights.	75	2.0	81	2.4	70	3.7
N10	Yes	Determine effect of tipping container on water surface.	52	2.2	61	3.2	42	3.6
O10	Yes	Identify polarity of ends of cut magnet.	61	2.3	61	3.2	59	3.4
O13	Yes	Relate circular motion to centripetal force.	63	1.8	70	2.9	58	3.0
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	92	1.2	93	1.9	91	1.8
P02	Yes	Explain relationship between illuminance and distance of light source.	29	1.7	29	2.9	30	2.7
P05	Yes	Explain why balloon expands upon heating.	49	2.2	51	2.8	48	2.8
Q12	Yes	Explain how focusing affects the amount of light.	46	2.1	45	2.6	47	3.4
Q13	Yes	Compare heat expansion properties of metal and glass.	65	2.2	64	3.2	65	3.0
Q18	Yes	Explain effect of melting on the mass of ice cubes.	43	2.4	45	3.5	40	4.0
R01	Yes	Choose diagram showing angle of reflected light.	73	2.2	73	2.5	72	3.0
R02	Yes	Identify reflection/absorption properties from color.	46	2.6	44	3.6	49	4.0
Y01	Yes	Explain amount of light/electric energy in a lamp.	8	1.1	10	1.6	6	1.1
Y02	Yes	Explain temperature of melting snowball.	16	1.3	17	2.1	15	1.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Colombia SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	39	1.5	42	2.6	37	2.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	79	1.6	77	2.2	81	2.0
F06	No	Relate rusting iron to the presence of oxygen and moisture.	58	1.9	60	3.9	56	3.0
G10	No	Select correct statement regarding the atomic makeup of matter.	53	1.6	53	3.6	53	2.6
H06	No	Know if wood-burning reaction absorbs or releases energy.	28	2.9	37	2.8	19	3.5
J03	Yes	Know relationship between molecules, atoms and cells.	21	2.5	18	3.7	24	3.2
J04	Yes	Distiguish between a chemical reaction and a physical change.	21	2.6	25	4.5	17	3.0
J06	Yes	Know what happens to atoms in animal after death.	26	3.8	31	7.2	22	3.5
J08	Yes	Identify gas involved in fire ignition.	11	1.9	10	2.7	13	2.8
M10	Yes	Identify substances which are mixtures.	22	3.9	17	3.7	25	7.1
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	20	2.9	25	4.7	16	3.6
N07	Yes	Explain oxygen fuel requirements of burning candle.	58	3.1	70	4.3	47	3.7
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	29	3.0	32	5.2	24	3.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	14	2.3	15	3.7	14	2.8
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	40	4.1	40	5.3	41	6.0
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	42	4.2	43	5.8	40	5.2
Q15	Yes	Determine physical processes involving chemical change.	18	3.9	23	4.5	14	4.1
R05	Yes	Explain how carbon dioxide fire extinguishers work.	23	4.1	32	5.4	16	4.3
Z01A	Yes	Explain why steel bridges must be painted.	34	4.0	33	5.5	36	5.9
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	17	3.8	16	3.4	19	6.5
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	12	1.9	14	3.0	11	2.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Colombia SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	36	1.1	39	1.6	34	1.8
B01	No	Identify hottest layer of the Earth.	69	1.9	72	3.1	66	2.6
B05	No	Use elevation/weather diagram to locate earth feature.	43	2.6	41	3.2	44	3.4
C07	No	Relate mountain shape to age.	7	0.8	8	1.5	6	1.0
D03	No	Identify direction of river flow on contour map.	12	1.2	13	1.7	11	1.5
E09	No	Use table of time/temperature to determine point when weather changes.	59	2.0	64	3.5	55	3.4
E12	No	Identify type of stone involved in cave formation.	33	1.8	36	3.1	30	2.4
F05	No	Relate level of oxygen to elevation.	64	2.4	67	4.2	60	3.0
G11	No	Identify type of rock from description of its formation.	34	2.0	32	2.9	36	2.2
H03	No	Select explanation for moonlight.	63	1.9	69	2.4	57	2.5
H04	No	Identify ground layer containing the most organic material.	38	2.1	46	3.4	31	3.1
I17	Yes	Know energy source for Earth’s water cycle.	38	4.3	46	6.2	30	5.2
J01	Yes	Know changes in Earth’s surface over billions of years.	16	2.6	13	2.9	20	3.7
K15	Yes	Know organic origins of fossil fuels.	51	3.7	56	3.9	48	5.8
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	25	4.0	29	4.5	22	7.2
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	67	4.2	63	6.9	71	4.3
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	17	2.4	22	3.7	13	2.8
Q16	Yes	Estimate time for light from star to reach Earth.	18	2.6	17	3.4	19	4.2
R04	Yes	Give reason why ozone layer is important for life.	55	4.0	59	5.2	52	5.6
W01A	Yes	Give reason region in land/water diagram is a good farming location.	62	3.0	62	5.7	61	3.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	26	2.0	26	3.6	26	3.8
W02	Yes	Draw diagram showing Earth’s water cycle.	15	1.9	16	2.8	13	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Colombia SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	50	1.5	53	2.5	47	2.1
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	61	1.9	66	3.7	56	2.4
F04	No	Predict type of area where soil erosion by rain is most likely.	59	2.2	63	3.2	55	2.8
G12	No	Identify a nonrenewable natural resource.	47	2.5	43	3.6	51	2.4
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	16	4.1	13	2.7	18	7.6
I13	Yes	Select best scale for accurate measurement.	37	3.1	39	5.4	34	4.6
I15	Yes	Identify the type of scientific statement given in an experimental report.	27	3.4	22	3.8	31	5.1
I18	Yes	Write conclusion from summary of experimental observations.	15	2.1	14	2.9	17	3.5
K19	Yes	Write an example of how computers are used to do work.	55	3.6	56	3.9	54	5.6
N01	Yes	Determine correct control experiment to test hypothesis.	44	4.4	40	7.2	47	5.3
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	42	3.7	44	5.2	42	5.8
N05	Yes	Identify a principal cause of acid rain.	31	3.9	36	6.2	26	4.2
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	39	4.0	36	4.5	42	6.0
Z02A	Yes	Write a reason why not all people have enough water.	45	3.7	46	5.3	45	5.1
Z02B	Yes	Write a second reason why not all people have enough water.	33	3.3	37	4.8	29	4.5

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Colombia SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	71	2.4	69	3.9	74	1.8
B04	No	Predict pulse/breathing rate change after exercise.	74	1.8	76	2.4	72	2.8
C08	No	Identify carrier of signals from eye to brain.	65	1.5	69	2.3	62	2.4
D05	No	Identify system carrying sensory messages to the brain.	57	2.9	59	4.1	56	3.3
D06	No	Relate plant part to seed development.	56	3.0	58	4.2	54	3.5
E08	No	Select correct statement of trait heredity from parents.	67	2.1	68	4.0	66	3.8
E10	No	Determine characteristics for classifying animals.	13	1.4	16	2.4	10	1.6
F01	No	Identify characteristic of mammal.	57	2.1	57	3.7	57	2.7
F03	No	Identify human organ which interprets senses.	56	2.1	58	3.6	54	2.6
G08	No	Identify main function of red blood cells.	44	1.7	46	3.4	44	2.4
G09	No	Identify reproductive cells involved in heredity.	82	1.4	80	2.4	83	1.9
H01	No	Identify the functions of blood.	64	3.0	66	5.3	62	2.6
H02	No	Identify the role of vitamins.	82	2.4	78	4.4	85	1.7
I10	Yes	Identify nutrition content of fruits and vegetables.	48	4.2	46	6.2	50	6.3
I11	Yes	Know identifying features of insects.	20	2.5	25	3.6	16	3.7
I14	Yes	Relate elbow action to a simple machine.	51	4.4	49	6.0	52	6.2
I19	Yes	Identify statement of oxygen production consistent with data.	25	3.0	24	4.2	25	4.4
J02	Yes	Choose species on Earth for shortest time.	37	3.6	43	6.5	32	3.3
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	33	3.1	29	4.9	37	4.0
J09	Yes	Explain how to determine the age of a cut tree.	20	3.0	28	5.5	14	3.0
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	40	3.0	42	3.7	38	4.9
K12	Yes	Relate reproductive cell production to population.	20	2.5	21	3.5	20	3.7
K16	Yes	Identify common product made with bacteria.	26	3.0	26	3.0	26	4.8
K18	Yes	Identify main function of chloroplasts in plant cell.	31	2.8	33	3.8	29	4.2
L02	Yes	Select reason why algae are close to ocean surface.	35	3.9	40	6.6	30	4.4
L03	Yes	Identify skull features typical of predators.	63	4.0	68	7.0	57	4.4
L05	Yes	Select most likely purpose for birds' singing.	51	3.9	58	6.0	44	4.1
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	45	3.8	44	6.3	45	4.2
M11	Yes	Complete a food web showing energy relationships.	41	3.9	43	5.7	38	5.1
N02	Yes	Choose meal which would give the most nutrients.	17	2.3	18	3.6	17	3.2
N04	Yes	Identify how decaying fish fertilize plants.	40	3.8	46	6.0	33	4.6
N06	Yes	Identify the most basic unit of living things.	75	2.9	76	4.3	74	4.3
O16	Yes	Give reason for thirst on a hot day.	40	4.0	39	5.4	41	6.1
O17	Yes	Describe how disease may be transmitted.	47	4.2	42	5.9	53	5.6
P04	Yes	Identify what happens to animals' biological processes during hibernation.	27	2.7	31	3.6	23	3.4
P06	Yes	Describe digestion occuring in the mouth.	33	4.1	32	4.7	34	6.3
Q17	Yes	Describe the advantage of having two eyes.	47	3.6	50	4.0	44	5.3
R03	Yes	Give example of consequences of introducing new species.	12	3.7	14	4.1	10	3.9
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	6	2.1	6	3.8	6	1.5
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	55	3.4	56	5.8	55	3.8
X02B	Yes	Explain why light is important in aquarium ecosystem.	20	2.3	22	4.1	18	2.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Colombia SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	49	1.9	52	2.7	47	2.4
A10	No	Relate light level and reflectance to vision of object.	58	1.9	58	3.0	57	2.3
B02	No	Know type of energy released from combustion engine.	43	2.0	40	2.1	46	3.5
B03	No	Determine density from mass/volume table.	13	2.1	12	1.9	13	4.6
B06	No	Relate color of object to amount of light reflection.	74	1.9	71	2.7	77	2.2
C09	No	Identify correct position of reflected image.	49	1.9	53	3.6	45	2.0
C12	No	Identify substance which is NOT a fossil fuel.	58	1.6	61	2.4	54	2.1
D01	No	Identify correct diagram of light rays through lens.	15	1.7	22	2.7	8	1.1
D02	No	Identify substance from magnetic properties.	57	2.3	60	4.7	55	3.4
D04	No	Relate physical event to its sequence of energy changes.	44	3.1	43	4.5	45	3.8
E07	No	Identify particles found in the nucleus of atoms.	38	2.3	36	3.3	39	3.7
E11	No	Find shadow size from diagram of bulb/card/screen distances.	48	1.8	52	2.7	44	3.4
F02	No	Relate color and light reflection to temperature of object.	15	1.4	18	2.4	11	1.6
G07	No	Identify correct way to place batteries in a flashlight.	76	1.7	81	2.9	72	2.2
H05	No	Identify source of energy stored in food.	22	2.7	26	5.0	17	3.4
I16	Yes	Identify material with greatest heat conductivity.	76	4.2	73	7.4	78	3.9
J05	Yes	Identify type of solar radiation that causes sunburn.	68	3.1	73	4.9	64	4.2
K10	Yes	Describe a method demonstrating the existence of air.	46	3.4	42	3.8	50	5.5
K13	Yes	Identify electrical conductors that form complete circuits.	63	3.2	71	4.2	55	5.1
K14	Yes	Relate evaporation rate to surface area.	59	3.6	57	4.0	61	5.6
K17	Yes	Relate presence of gravitational force to position of falling object.	48	3.6	45	3.5	50	5.8
L01	Yes	Select diagram showing forces resulting in rotation.	27	3.0	30	4.8	22	3.5
L04	Yes	Explain most efficient engine.	10	2.1	9	2.4	11	3.2
L07	Yes	Relate sound transmission to air.	52	4.0	53	6.7	51	4.2
M12	Yes	Complete table of voltage/current data for circuit.	23	4.1	21	4.1	25	6.9
M14	Yes	Draw reflected image of object.	43	3.6	46	6.0	40	4.3
N08	Yes	Relate lever arm lengths to balanced weights.	59	3.6	70	4.5	47	5.1
N10	Yes	Determine effect of tipping container on water surface.	22	2.6	34	4.5	10	2.5
O10	Yes	Identify polarity of ends of cut magnet.	19	2.4	19	3.7	18	3.1
O13	Yes	Relate circular motion to centripetal force.	33	3.7	39	5.8	27	4.5
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	59	3.9	62	6.7	57	5.0
P02	Yes	Explain relationship between illuminance and distance of light source.	6	1.2	11	2.5	2	1.0
P05	Yes	Explain why balloon expands upon heating.	50	4.4	51	5.8	49	6.3
Q12	Yes	Explain how focusing affects the amount of light.	18	2.5	21	3.8	16	3.1
Q13	Yes	Compare heat expansion properties of metal and glass.	19	2.5	18	3.3	21	3.6
Q18	Yes	Explain effect of melting on the mass of ice cubes.	10	3.7	13	4.3	8	3.7
R01	Yes	Choose diagram showing angle of reflected light.	54	3.9	54	4.8	53	5.5
R02	Yes	Identify reflection/absorption properties from color.	17	2.1	20	3.1	14	2.9
Y01	Yes	Explain amount of light/electric energy in a lamp.	1	0.3	1	0.4	1	0.5
Y02	Yes	Explain temperature of melting snowball.	3	0.7	2	0.9	3	1.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Cyprus SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	81	0.8	83	1.2	80	1.4
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	67	1.4	67	2.0	67	2.0
F06	No	Relate rusting iron to the presence of oxygen and moisture.	59	1.5	61	1.9	56	2.4
G10	No	Select correct statement regarding the atomic makeup of matter.	50	1.7	48	2.1	53	2.4
H06	No	Know if wood-burning reaction absorbs or releases energy.	53	1.7	56	2.8	50	2.1
J03	Yes	Know relationship between molecules, atoms and cells.	35	2.9	39	4.1	30	3.8
J04	Yes	Distiguish between a chemical reaction and a physical change.	44	2.4	48	3.7	40	3.8
J06	Yes	Know what happens to atoms in animal after death.	12	1.8	13	2.7	9	2.3
J08	Yes	Identify gas involved in fire ignition.	68	2.2	70	3.7	65	3.7
M10	Yes	Identify substances which are mixtures.	30	2.1	29	3.2	30	2.9
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	65	2.9	63	4.1	66	3.7
N07	Yes	Explain oxygen fuel requirements of burning candle.	82	1.8	81	2.7	82	2.2
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	43	2.9	37	3.3	49	4.2
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	22	2.8	24	3.2	21	4.4
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	44	3.1	39	3.6	51	4.5
R05	Yes	Explain how carbon dioxide fire extinguishers work.	41	3.3	42	3.9	39	4.4
Z01A	Yes	Explain why steel bridges must be painted.	57	2.6	60	4.0	54	3.2
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	20	2.6	25	4.0	15	3.1
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	16	1.8	16	2.7	15	2.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Cyprus SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	38	1.2	38	1.5	38	1.7
B01	No	Identify hottest layer of the Earth.	78	1.6	80	2.0	76	2.2
B05	No	Use elevation/weather diagram to locate earth feature.	40	1.8	42	2.1	39	2.4
C07	No	Relate mountain shape to age.	22	1.7	27	2.3	18	2.0
D03	No	Identify direction of river flow on contour map.	21	1.2	25	1.9	17	2.1
E09	No	Use table of time/temperature to determine point when weather changes.	73	1.4	70	2.3	76	1.5
E12	No	Identify type of stone involved in cave formation.	68	1.5	67	2.0	69	2.2
F05	No	Relate level of oxygen to elevation.	66	1.5	66	2.3	66	2.1
G11	No	Identify type of rock from description of its formation.	43	2.2	43	2.8	42	2.7
H03	No	Select explanation for moonlight.	81	1.6	82	1.9	79	2.3
H04	No	Identify ground layer containing the most organic material.	50	1.6	55	2.2	46	2.4
I17	Yes	Know energy source for Earth’s water cycle.	52	2.8	51	3.8	53	3.5
K15	Yes	Know organic origins of fossil fuels.	33	2.7	39	4.2	28	3.3
O12	Yes	Know relative amounts of components in air.	33	3.3	32	4.4	35	5.2
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	31	3.4	38	4.1	25	4.2
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	73	2.5	66	3.4	82	3.4
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	49	2.6	50	3.5	47	4.6
Q16	Yes	Estimate time for light from star to reach Earth.	15	1.8	14	2.6	15	2.4
R04	Yes	Give reason why ozone layer is important for life.	42	3.0	44	3.8	41	4.4
W01A	Yes	Give reason region in land/water diagram is a good farming location.	77	1.8	74	2.6	81	2.4
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	23	1.8	28	3.1	18	2.5
W02	Yes	Draw diagram showing Earth’s water cycle.	24	2.0	24	2.6	24	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Cyprus SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	55	1.4	57	1.4	54	2.0
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	39	1.6	45	2.2	33	2.4
F04	No	Predict type of area where soil erosion by rain is most likely.	76	1.4	77	1.7	77	2.2
G12	No	Identify a nonrenewable natural resource.	57	1.8	54	2.4	59	2.3
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	28	2.8	32	4.0	22	3.6
I13	Yes	Select best scale for accurate measurement.	51	2.9	55	3.9	48	4.3
I15	Yes	Identify the type of scientific statement given in an experimental report.	52	2.8	46	3.9	58	3.5
I18	Yes	Write conclusion from summary of experimental observations.	35	2.6	30	3.6	41	3.7
K19	Yes	Write an example of how computers are used to do work.	53	3.0	51	3.9	54	4.3
N01	Yes	Determine correct control experiment to test hypothesis.	31	2.9	32	4.6	30	3.4
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	65	2.5	58	3.5	71	3.5
N05	Yes	Identify a principal cause of acid rain.	23	2.2	27	3.9	19	2.8
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	51	3.3	45	3.9	59	4.3
Z02A	Yes	Write a reason why not all people have enough water.	50	2.6	47	3.9	52	3.6
Z02B	Yes	Write a second reason why not all people have enough water.	29	2.4	23	3.1	35	3.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Cyprus SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	72	1.0	64	1.7	80	1.3
B04	No	Predict pulse/breathing rate change after exercise.	90	0.9	90	1.2	92	1.2
C08	No	Identify carrier of signals from eye to brain.	61	1.7	56	2.1	65	2.4
D05	No	Identify system carrying sensory messages to the brain.	57	1.8	56	2.4	57	2.3
D06	No	Relate plant part to seed development.	65	1.8	63	2.4	68	2.4
E08	No	Select correct statement of trait heredity from parents.	79	1.1	74	1.6	85	1.5
E10	No	Determine characteristics for classifying animals.	49	1.7	51	2.2	48	3.1
F01	No	Identify characteristic of mammal.	72	1.7	71	2.2	73	2.3
G08	No	Identify main function of red blood cells.	57	1.9	55	2.4	59	2.8
G09	No	Identify reproductive cells involved in heredity.	67	1.6	63	1.9	70	2.2
H02	No	Identify the role of vitamins.	67	1.9	62	2.1	72	2.7
I10	Yes	Identify nutrition content of fruits and vegetables.	39	2.6	43	3.7	34	3.9
I11	Yes	Know identifying features of insects.	36	3.1	42	4.3	29	4.2
I14	Yes	Relate elbow action to a simple machine.	53	2.8	47	3.6	59	4.4
I19	Yes	Identify statement of oxygen production consistent with data.	44	2.6	42	3.1	47	3.4
J02	Yes	Choose species on Earth for shortest time.	29	2.6	29	2.9	28	4.1
J09	Yes	Explain how to determine the age of a cut tree.	62	3.1	59	3.8	64	4.7
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	45	3.0	42	4.3	48	3.8
K12	Yes	Relate reproductive cell production to population.	57	2.6	50	4.2	64	3.6
K16	Yes	Identify common product made with bacteria.	35	2.9	33	3.9	36	3.9
K18	Yes	Identify main function of chloroplasts in plant cell.	52	2.5	51	3.9	53	3.3
L02	Yes	Select reason why algae are close to ocean surface.	36	2.5	37	4.2	34	3.6
L03	Yes	Identify skull features typical of predators.	71	2.4	72	3.0	71	3.6
L05	Yes	Select most likely purpose for birds' singing.	64	2.8	65	4.6	63	3.8
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	26	2.5	27	3.9	26	3.5
M11	Yes	Complete a food web showing energy relationships.	51	3.6	47	4.2	54	4.7
N02	Yes	Choose meal which would give the most nutrients.	53	3.1	49	4.1	56	4.0
N04	Yes	Identify how decaying fish fertilize plants.	37	2.6	32	4.1	41	2.9
N06	Yes	Identify the most basic unit of living things.	64	2.8	66	4.1	62	3.6
O16	Yes	Give reason for thirst on a hot day.	49	3.2	46	4.5	54	5.0
O17	Yes	Describe how disease may be transmitted.	15	2.1	12	2.9	17	2.6
P04	Yes	Identify what happens to animals' biological processes during hibernation.	44	3.0	47	4.0	41	4.4
P06	Yes	Describe digestion occuring in the mouth.	32	3.0	27	3.4	40	5.4
Q17	Yes	Describe the advantage of having two eyes.	60	3.0	59	3.5	62	4.7
R03	Yes	Give example of consequences of introducing new species.	4	1.3	3	1.5	4	1.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	6	1.1	4	1.1	8	1.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	57	1.7	56	2.6	58	2.6
X02B	Yes	Explain why light is important in aquarium ecosystem.	38	2.4	35	3.1	41	3.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Cyprus SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	57	1.3	60	1.7	54	1.9
A10	No	Relate light level and reflectance to vision of object.	63	1.2	64	1.8	62	1.5
B02	No	Know type of energy released from combustion engine.	63	1.6	59	2.2	67	2.0
B03	No	Determine density from mass/volume table.	19	1.2	23	2.0	15	1.4
B06	No	Relate color of object to amount of light reflection.	69	1.3	68	1.8	71	1.7
C09	No	Identify correct position of reflected image.	59	1.6	62	1.9	56	2.1
C12	No	Identify substance which is NOT a fossil fuel.	30	1.6	33	2.3	28	2.1
D01	No	Identify correct diagram of light rays through lens.	27	2.0	29	2.7	24	2.2
D02	No	Identify substance from magnetic properties.	67	1.8	67	2.1	66	2.7
D04	No	Relate physical event to its sequence of energy changes.	64	1.9	62	3.0	66	2.1
E07	No	Identify particles found in the nucleus of atoms.	31	1.7	28	2.1	33	2.6
E11	No	Find shadow size from diagram of bulb/card/screen distances.	49	1.8	46	1.7	52	2.9
F02	No	Relate color and light reflection to temperature of object.	48	1.8	52	2.1	43	2.5
G07	No	Identify correct way to place batteries in a flashlight.	84	1.2	84	1.7	85	1.8
H05	No	Identify source of energy stored in food.	13	1.0	12	1.3	14	1.6
I16	Yes	Identify material with greatest heat conductivity.	77	2.5	76	3.5	79	3.4
J05	Yes	Identify type of solar radiation that causes sunburn.	39	2.7	38	3.5	40	4.5
K10	Yes	Describe a method demonstrating the existence of air.	39	2.8	38	3.6	40	3.8
K13	Yes	Identify electrical conductors that form complete circuits.	73	2.6	78	3.2	69	3.6
K14	Yes	Relate evaporation rate to surface area.	77	2.4	77	3.0	77	4.0
K17	Yes	Relate presence of gravitational force to position of falling object.	36	2.6	37	4.4	34	3.4
L01	Yes	Select diagram showing forces resulting in rotation.	36	2.4	39	2.8	34	3.3
L04	Yes	Explain most efficient engine.	36	2.6	37	3.2	34	4.1
L07	Yes	Relate sound transmission to air.	62	2.4	59	3.1	66	3.6
M12	Yes	Complete table of voltage/current data for circuit.	55	2.8	57	3.7	54	4.0
M14	Yes	Draw reflected image of object.	47	3.1	51	4.3	44	3.7
N08	Yes	Relate lever arm lengths to balanced weights.	55	2.4	59	3.8	52	3.2
N10	Yes	Determine effect of tipping container on water surface.	39	2.2	44	3.7	35	3.7
O10	Yes	Identify polarity of ends of cut magnet.	29	3.0	26	3.7	33	3.8
O13	Yes	Relate circular motion to centripetal force.	51	3.4	52	5.2	50	4.0
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	64	2.5	68	3.1	59	4.1
P02	Yes	Explain relationship between illuminance and distance of light source.	6	1.4	5	1.7	8	2.7
P05	Yes	Explain why balloon expands upon heating.	58	3.0	54	4.0	63	4.5
Q12	Yes	Explain how focusing affects the amount of light.	45	3.0	48	4.4	41	4.4
Q13	Yes	Compare heat expansion properties of metal and glass.	38	2.9	35	3.8	41	3.7
Q18	Yes	Explain effect of melting on the mass of ice cubes.	30	2.9	35	4.1	25	3.6
R01	Yes	Choose diagram showing angle of reflected light.	78	3.2	81	3.6	75	4.2
R02	Yes	Identify reflection/absorption properties from color.	42	3.3	46	3.9	37	4.3
Y01	Yes	Explain amount of light/electric energy in a lamp.	4	1.1	4	1.5	3	1.1
Y02	Yes	Explain temperature of melting snowball.	6	1.1	7	1.8	6	1.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Czech Republic SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	82	1.0	86	1.3	77	1.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	88	1.3	88	1.6	87	2.1
F06	No	Relate rusting iron to the presence of oxygen and moisture.	79	1.4	82	1.7	75	2.1
G10	No	Select correct statement regarding the atomic makeup of matter.	58	2.0	65	2.7	51	2.9
H06	No	Know if wood-burning reaction absorbs or releases energy.	56	2.6	64	2.9	48	3.3
J03	Yes	Know relationship between molecules, atoms and cells.	43	3.9	43	4.2	44	4.9
J04	Yes	Distiguish between a chemical reaction and a physical change.	67	3.0	72	3.5	62	4.8
J06	Yes	Know what happens to atoms in animal after death.	22	2.9	27	4.4	17	3.6
J08	Yes	Identify gas involved in fire ignition.	64	2.3	72	3.9	56	3.4
M10	Yes	Identify substances which are mixtures.	63	3.5	57	4.8	70	3.6
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	52	3.0	56	3.9	49	5.6
N07	Yes	Explain oxygen fuel requirements of burning candle.	98	1.0	98	1.4	97	1.6
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	68	3.3	79	4.1	57	5.2
O11	Yes	Identify which change in elemental form is due to a chemical change.	43	3.5	46	4.9	41	3.9
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	73	3.0	69	3.7	76	4.1
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	55	2.8	58	3.6	52	4.1
Q15	Yes	Determine physical processes involving chemical change.	34	4.0	36	4.3	33	5.0
R05	Yes	Explain how carbon dioxide fire extinguishers work.	57	2.8	68	3.9	45	3.9
Z01A	Yes	Explain why steel bridges must be painted.	85	2.1	89	2.1	80	3.7
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	46	3.4	52	4.5	40	4.6
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	33	2.6	37	3.2	29	4.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Czech Republic SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	77	1.2	80	1.6	74	1.8
B01	No	Identify hottest layer of the Earth.	97	0.5	98	0.5	96	0.8
B05	No	Use elevation/weather diagram to locate earth feature.	58	2.6	59	2.7	58	3.9
C07	No	Relate mountain shape to age.	53	2.6	58	3.0	48	3.4
D03	No	Identify direction of river flow on contour map.	42	2.3	54	3.2	30	2.8
E09	No	Use table of time/temperature to determine point when weather changes.	90	0.9	91	1.1	88	1.4
E12	No	Identify type of stone involved in cave formation.	83	1.5	84	2.0	83	1.7
F05	No	Relate level of oxygen to elevation.	93	0.9	94	1.0	91	1.5
G11	No	Identify type of rock from description of its formation.	52	1.7	45	2.4	58	2.3
H03	No	Select explanation for moonlight.	85	1.6	90	1.6	80	2.3
H04	No	Identify ground layer containing the most organic material.	71	2.0	76	2.2	65	3.1
I17	Yes	Know energy source for Earth’s water cycle.	58	2.9	61	3.9	54	4.8
J01	Yes	Know changes in Earth’s surface over billions of years.	48	3.6	52	4.9	44	4.2
K15	Yes	Know organic origins of fossil fuels.	60	3.1	70	3.8	51	4.6
O12	Yes	Know relative amounts of components in air.	38	3.8	36	4.1	40	4.5
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	70	3.1	77	3.7	63	5.0
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	88	2.2	86	3.4	90	2.4
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	56	3.1	61	3.3	51	4.4
Q16	Yes	Estimate time for light from star to reach Earth.	38	2.4	46	4.2	29	3.4
R04	Yes	Give reason why ozone layer is important for life.	74	2.7	80	2.7	67	4.4
W01A	Yes	Give reason region in land/water diagram is a good farming location.	84	1.9	83	2.7	86	2.1
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	42	2.5	41	2.7	42	3.6
W02	Yes	Draw diagram showing Earth’s water cycle.	27	2.9	31	3.2	24	3.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Czech Republic SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	79	1.3	81	1.7	77	1.7
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	45	2.2	54	2.5	37	3.2
F04	No	Predict type of area where soil erosion by rain is most likely.	82	1.9	85	2.2	79	2.2
G12	No	Identify a nonrenewable natural resource.	51	1.8	59	2.5	43	2.3
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	41	2.8	49	4.2	34	3.7
I13	Yes	Select best scale for accurate measurement.	80	2.0	84	2.3	76	3.7
I15	Yes	Identify the type of scientific statement given in an experimental report.	63	3.6	64	4.0	62	5.0
I18	Yes	Write conclusion from summary of experimental observations.	45	3.2	41	3.7	50	5.1
K19	Yes	Write an example of how computers are used to do work.	78	2.0	83	2.9	73	3.1
N01	Yes	Determine correct control experiment to test hypothesis.	42	2.5	46	3.5	38	4.3
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	59	2.9	70	3.5	47	4.2
N05	Yes	Identify a principal cause of acid rain.	45	3.0	53	3.3	37	4.7
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	64	2.7	64	3.6	65	4.4
Z02A	Yes	Write a reason why not all people have enough water.	71	2.8	78	3.1	64	4.6
Z02B	Yes	Write a second reason why not all people have enough water.	40	3.2	43	3.9	36	4.9

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Czech Republic SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	78	1.2	76	1.4	79	1.6
B04	No	Predict pulse/breathing rate change after exercise.	94	0.8	93	1.1	94	1.3
C08	No	Identify carrier of signals from eye to brain.	86	1.4	87	1.6	85	2.4
D05	No	Identify system carrying sensory messages to the brain.	89	1.1	91	1.4	88	1.8
D06	No	Relate plant part to seed development.	95	0.7	95	1.0	95	1.0
E08	No	Select correct statement of trait heredity from parents.	90	1.1	88	1.4	92	1.3
E10	No	Determine characteristics for classifying animals.	65	2.0	64	2.7	66	2.4
F01	No	Identify characteristic of mammal.	82	1.5	82	1.8	82	2.1
F03	No	Identify human organ which interprets senses.	73	1.8	78	2.2	67	2.3
G08	No	Identify main function of red blood cells.	80	1.6	81	1.9	79	2.0
G09	No	Identify reproductive cells involved in heredity.	90	1.0	88	1.5	93	1.1
H01	No	Identify the functions of blood.	86	1.5	88	1.7	84	2.3
H02	No	Identify the role of vitamins.	81	1.9	80	2.2	82	2.4
I10	Yes	Identify nutrition content of fruits and vegetables.	92	1.5	89	2.6	96	1.6
I11	Yes	Know identifying features of insects.	47	3.0	50	3.5	43	5.0
I14	Yes	Relate elbow action to a simple machine.	73	2.4	75	3.0	71	4.1
I19	Yes	Identify statement of oxygen production consistent with data.	63	2.9	63	3.9	62	4.3
J02	Yes	Choose species on Earth for shortest time.	78	2.5	80	2.9	76	3.2
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	53	3.4	58	4.3	48	4.6
J09	Yes	Explain how to determine the age of a cut tree.	88	2.5	90	3.3	86	3.3
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	72	2.6	75	3.5	70	3.9
K12	Yes	Relate reproductive cell production to population.	63	3.1	65	4.4	61	3.6
K16	Yes	Identify common product made with bacteria.	45	2.8	49	4.9	41	4.1
K18	Yes	Identify main function of chloroplasts in plant cell.	64	2.6	63	4.7	64	3.8
L02	Yes	Select reason why algae are close to ocean surface.	76	2.4	82	2.7	68	4.0
L03	Yes	Identify skull features typical of predators.	77	2.4	80	2.6	74	4.1
L05	Yes	Select most likely purpose for birds' singing.	70	3.1	74	3.7	66	3.8
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	62	3.2	64	4.4	59	4.4
M11	Yes	Complete a food web showing energy relationships.	82	2.4	86	2.8	79	3.1
N02	Yes	Choose meal which would give the most nutrients.	52	2.7	46	4.0	60	3.6
N04	Yes	Identify how decaying fish fertilize plants.	54	3.0	53	3.8	54	3.6
N06	Yes	Identify the most basic unit of living things.	81	2.8	82	3.6	80	4.3
O16	Yes	Give reason for thirst on a hot day.	72	3.4	70	4.4	75	3.7
O17	Yes	Describe how disease may be transmitted.	68	2.5	64	4.3	71	3.8
P04	Yes	Identify what happens to animals' biological processes during hibernation.	69	3.0	72	3.0	64	4.3
P06	Yes	Describe digestion occuring in the mouth.	44	3.4	45	4.5	42	4.7
Q17	Yes	Describe the advantage of having two eyes.	74	3.0	78	3.0	70	4.4
R03	Yes	Give example of consequences of introducing new species.	15	2.1	19	3.1	11	3.4
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	19	1.6	21	2.2	18	2.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	74	2.0	73	2.4	74	2.9
X02B	Yes	Explain why light is important in aquarium ecosystem.	42	2.9	43	3.8	41	3.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Czech Republic SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	67	1.3	66	1.8	67	1.7
A10	No	Relate light level and reflectance to vision of object.	69	1.0	74	1.8	65	1.6
B02	No	Know type of energy released from combustion engine.	68	1.9	74	2.0	61	3.3
B03	No	Determine density from mass/volume table.	36	1.8	40	2.3	31	2.3
B06	No	Relate color of object to amount of light reflection.	92	0.9	92	1.2	92	1.4
C09	No	Identify correct position of reflected image.	76	1.5	81	1.7	71	3.0
C12	No	Identify substance which is NOT a fossil fuel.	68	1.5	68	1.9	67	2.0
D01	No	Identify correct diagram of light rays through lens.	54	2.0	67	2.2	40	3.1
D02	No	Identify substance from magnetic properties.	94	1.1	94	1.6	94	1.1
D04	No	Relate physical event to its sequence of energy changes.	57	1.8	59	2.3	55	2.2
E07	No	Identify particles found in the nucleus of atoms.	74	2.0	74	2.2	74	2.5
E11	No	Find shadow size from diagram of bulb/card/screen distances.	59	1.7	59	2.3	59	2.4
F02	No	Relate color and light reflection to temperature of object.	88	1.4	89	1.2	86	2.1
G07	No	Identify correct way to place batteries in a flashlight.	94	0.9	98	0.6	90	2.0
H05	No	Identify source of energy stored in food.	25	1.8	24	2.1	26	3.0
I16	Yes	Identify material with greatest heat conductivity.	86	2.3	83	3.0	89	2.9
J05	Yes	Identify type of solar radiation that causes sunburn.	63	3.1	69	4.3	57	5.4
K10	Yes	Describe a method demonstrating the existence of air.	26	2.4	23	3.4	29	3.0
K13	Yes	Identify electrical conductors that form complete circuits.	89	1.4	93	1.9	85	2.4
K14	Yes	Relate evaporation rate to surface area.	87	1.8	91	2.1	83	3.2
K17	Yes	Relate presence of gravitational force to position of falling object.	81	2.6	83	3.3	79	3.1
L01	Yes	Select diagram showing forces resulting in rotation.	69	2.9	79	2.9	57	4.4
L04	Yes	Explain most efficient engine.	48	3.2	57	4.0	37	4.0
L07	Yes	Relate sound transmission to air.	76	2.8	79	3.7	71	4.2
M12	Yes	Complete table of voltage/current data for circuit.	59	2.7	65	3.7	53	4.2
M14	Yes	Draw reflected image of object.	73	3.3	74	4.0	72	5.0
N08	Yes	Relate lever arm lengths to balanced weights.	82	2.5	86	2.9	77	4.2
N10	Yes	Determine effect of tipping container on water surface.	74	2.7	89	2.2	59	4.7
O10	Yes	Identify polarity of ends of cut magnet.	74	2.6	72	4.9	76	4.1
O13	Yes	Relate circular motion to centripetal force.	75	2.1	83	3.1	67	3.9
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	90	1.7	93	1.9	86	2.8
P02	Yes	Explain relationship between illuminance and distance of light source.	23	2.7	25	3.4	21	3.7
P05	Yes	Explain why balloon expands upon heating.	70	2.4	75	3.1	65	3.5
Q12	Yes	Explain how focusing affects the amount of light.	34	3.1	42	4.4	26	3.3
Q13	Yes	Compare heat expansion properties of metal and glass.	80	2.5	82	3.0	78	3.4
Q18	Yes	Explain effect of melting on the mass of ice cubes.	35	3.5	39	3.9	30	5.1
R01	Yes	Choose diagram showing angle of reflected light.	80	2.4	79	3.8	81	3.9
R02	Yes	Identify reflection/absorption properties from color.	47	3.1	48	3.8	46	4.4
Y01	Yes	Explain amount of light/electric energy in a lamp.	20	2.3	29	3.0	11	2.2
Y02	Yes	Explain temperature of melting snowball.	17	1.6	22	2.9	13	1.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Slovak Republic SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	81	0.9	86	1.2	76	1.2
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	93	0.8	91	1.4	94	0.8
F06	No	Relate rusting iron to the presence of oxygen and moisture.	76	1.5	79	1.6	74	2.0
G10	No	Select correct statement regarding the atomic makeup of matter.	62	2.0	68	2.3	56	2.9
H06	No	Know if wood-burning reaction absorbs or releases energy.	73	1.6	77	2.0	68	2.5
J03	Yes	Know relationship between molecules, atoms and cells.	42	2.6	44	3.2	40	3.8
J04	Yes	Distiguish between a chemical reaction and a physical change.	65	2.8	63	3.6	67	3.4
J06	Yes	Know what happens to atoms in animal after death.	19	2.0	18	2.7	20	2.7
J08	Yes	Identify gas involved in fire ignition.	78	2.7	85	3.0	71	3.7
M10	Yes	Identify substances which are mixtures.	50	2.9	50	3.9	50	3.8
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	43	2.4	44	3.5	41	3.6
N07	Yes	Explain oxygen fuel requirements of burning candle.	95	1.4	97	1.4	93	1.8
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	58	2.6	61	3.4	56	3.8
O11	Yes	Identify which change in elemental form is due to a chemical change.	37	3.0	41	4.3	33	3.6
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	77	2.6	78	3.2	76	3.4
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	47	2.7	54	4.0	41	3.4
Q15	Yes	Determine physical processes involving chemical change.	31	2.4	38	3.4	25	3.2
R05	Yes	Explain how carbon dioxide fire extinguishers work.	46	2.8	57	3.8	37	3.5
Z01A	Yes	Explain why steel bridges must be painted.	76	2.4	78	3.4	73	3.8
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	35	2.7	42	3.9	28	3.2
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	23	2.3	29	3.0	17	2.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Slovak Republic SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	75	1.1	76	1.3	74	1.6
B01	No	Identify hottest layer of the Earth.	93	0.7	94	0.9	92	0.9
B05	No	Use elevation/weather diagram to locate earth feature.	63	1.6	64	1.9	63	2.1
C07	No	Relate mountain shape to age.	48	2.4	55	2.8	42	3.0
D03	No	Identify direction of river flow on contour map.	40	1.9	48	2.3	31	2.5
E09	No	Use table of time/temperature to determine point when weather changes.	81	1.2	83	1.6	79	1.6
E12	No	Identify type of stone involved in cave formation.	87	1.1	88	1.4	86	1.6
F05	No	Relate level of oxygen to elevation.	92	0.8	92	1.1	93	1.2
G11	No	Identify type of rock from description of its formation.	17	1.6	17	1.7	18	2.3
H03	No	Select explanation for moonlight.	84	1.3	89	1.6	80	1.7
H04	No	Identify ground layer containing the most organic material.	56	2.0	62	2.3	50	2.5
I17	Yes	Know energy source for Earth’s water cycle.	53	2.5	55	3.5	51	3.6
J01	Yes	Know changes in Earth’s surface over billions of years.	70	2.4	66	3.3	75	3.2
K15	Yes	Know organic origins of fossil fuels.	55	3.0	59	3.9	51	3.7
O12	Yes	Know relative amounts of components in air.	32	2.9	34	3.8	30	3.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	63	2.9	72	3.5	55	4.0
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	87	1.8	85	2.8	88	2.2
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	55	2.5	56	3.8	53	3.6
Q16	Yes	Estimate time for light from star to reach Earth.	28	2.5	38	4.0	20	3.3
R04	Yes	Give reason why ozone layer is important for life.	71	2.0	75	3.2	67	3.2
W01A	Yes	Give reason region in land/water diagram is a good farming location.	83	1.8	83	2.5	82	2.1
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	40	2.1	36	2.6	43	2.7
W02	Yes	Draw diagram showing Earth’s water cycle.	25	1.8	29	2.3	21	2.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Slovak Republic SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	66	1.5	67	1.6	65	1.8
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	40	2.3	49	2.9	31	2.5
F04	No	Predict type of area where soil erosion by rain is most likely.	75	1.1	81	1.8	69	1.7
G12	No	Identify a nonrenewable natural resource.	58	1.8	60	2.2	55	2.4
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	37	2.7	37	4.1	37	3.2
I13	Yes	Select best scale for accurate measurement.	81	2.2	80	3.3	82	3.1
I15	Yes	Identify the type of scientific statement given in an experimental report.	58	2.6	54	3.9	62	2.9
I18	Yes	Write conclusion from summary of experimental observations.	30	2.4	31	3.3	29	3.0
K19	Yes	Write an example of how computers are used to do work.	78	2.1	79	3.1	78	3.2
N01	Yes	Determine correct control experiment to test hypothesis.	43	3.0	47	3.9	40	4.1
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	50	3.3	51	4.1	48	4.7
N05	Yes	Identify a principal cause of acid rain.	14	1.9	14	2.2	15	2.7
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	70	2.6	72	3.2	69	3.8
Z02A	Yes	Write a reason why not all people have enough water.	69	2.5	70	3.6	68	4.0
Z02B	Yes	Write a second reason why not all people have enough water.	34	2.5	29	3.8	38	3.1

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Slovak Republic SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	70	1.4	65	1.8	74	1.7
B04	No	Predict pulse/breathing rate change after exercise.	92	0.6	93	1.1	91	0.8
C08	No	Identify carrier of signals from eye to brain.	87	1.1	85	1.6	88	1.4
D05	No	Identify system carrying sensory messages to the brain.	84	1.2	84	1.7	83	1.5
D06	No	Relate plant part to seed development.	94	0.8	94	1.2	94	1.1
E08	No	Select correct statement of trait heredity from parents.	87	1.1	84	1.6	91	1.2
E10	No	Determine characteristics for classifying animals.	47	1.8	45	2.3	48	2.3
F01	No	Identify characteristic of mammal.	81	1.2	81	1.7	82	1.6
F03	No	Identify human organ which interprets senses.	19	1.3	21	1.6	18	1.8
G08	No	Identify main function of red blood cells.	81	1.2	85	1.3	77	2.1
G09	No	Identify reproductive cells involved in heredity.	82	1.4	78	1.9	86	1.7
H01	No	Identify the functions of blood.	80	1.6	78	2.0	81	1.8
H02	No	Identify the role of vitamins.	89	1.1	88	1.4	90	1.5
I10	Yes	Identify nutrition content of fruits and vegetables.	89	1.8	86	3.0	92	2.0
I11	Yes	Know identifying features of insects.	47	3.0	49	4.2	44	3.5
I14	Yes	Relate elbow action to a simple machine.	66	2.3	70	2.8	62	3.7
I19	Yes	Identify statement of oxygen production consistent with data.	50	2.6	53	3.8	47	3.8
J02	Yes	Choose species on Earth for shortest time.	27	2.5	30	3.6	24	3.4
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	58	2.9	59	3.8	57	3.8
J09	Yes	Explain how to determine the age of a cut tree.	96	0.9	97	1.1	95	1.5
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	67	2.5	70	3.1	64	4.0
K12	Yes	Relate reproductive cell production to population.	63	2.4	65	3.3	60	3.7
K16	Yes	Identify common product made with bacteria.	28	2.6	27	3.1	28	4.0
K18	Yes	Identify main function of chloroplasts in plant cell.	55	2.3	58	3.0	50	3.6
L02	Yes	Select reason why algae are close to ocean surface.	50	2.5	53	3.6	47	3.9
L03	Yes	Identify skull features typical of predators.	78	2.1	83	3.0	72	2.9
L05	Yes	Select most likely purpose for birds' singing.	76	2.2	77	2.9	74	3.1
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	60	2.3	61	2.9	58	3.7
M11	Yes	Complete a food web showing energy relationships.	78	2.3	78	3.0	78	3.2
N02	Yes	Choose meal which would give the most nutrients.	32	2.7	31	3.4	34	3.8
N04	Yes	Identify how decaying fish fertilize plants.	39	3.2	39	3.7	39	4.6
N06	Yes	Identify the most basic unit of living things.	89	1.7	88	2.2	90	2.5
O16	Yes	Give reason for thirst on a hot day.	67	2.4	71	3.5	63	3.6
O17	Yes	Describe how disease may be transmitted.	56	2.8	56	4.5	56	3.3
P04	Yes	Identify what happens to animals' biological processes during hibernation.	64	2.8	73	3.5	56	4.4
P06	Yes	Describe digestion occuring in the mouth.	25	2.4	28	3.0	23	3.4
Q17	Yes	Describe the advantage of having two eyes.	65	3.4	70	3.9	60	4.2
R03	Yes	Give example of consequences of introducing new species.	12	1.6	17	2.6	8	1.8
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	12	1.4	11	1.6	13	2.1
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	67	2.8	62	4.6	71	3.3
X02B	Yes	Explain why light is important in aquarium ecosystem.	34	2.5	33	3.7	35	3.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Slovak Republic SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	66	1.6	63	1.9	69	1.7
A10	No	Relate light level and reflectance to vision of object.	78	1.0	78	1.3	77	1.2
B02	No	Know type of energy released from combustion engine.	60	1.7	65	2.3	56	2.2
B03	No	Determine density from mass/volume table.	37	1.7	38	1.8	36	2.4
B06	No	Relate color of object to amount of light reflection.	93	0.7	94	0.9	92	1.0
C09	No	Identify correct position of reflected image.	69	1.5	71	2.2	67	2.2
C12	No	Identify substance which is NOT a fossil fuel.	22	1.6	22	2.1	21	2.2
D01	No	Identify correct diagram of light rays through lens.	66	2.1	72	2.5	60	2.7
D02	No	Identify substance from magnetic properties.	89	1.0	92	1.2	86	1.6
D04	No	Relate physical event to its sequence of energy changes.	65	1.7	72	1.8	57	2.7
E07	No	Identify particles found in the nucleus of atoms.	74	2.2	73	2.1	74	3.0
E11	No	Find shadow size from diagram of bulb/card/screen distances.	61	1.8	63	1.8	58	2.9
F02	No	Relate color and light reflection to temperature of object.	82	1.3	85	1.7	80	1.7
G07	No	Identify correct way to place batteries in a flashlight.	93	0.8	95	0.8	91	1.5
H05	No	Identify source of energy stored in food.	27	1.7	28	2.1	27	2.3
I16	Yes	Identify material with greatest heat conductivity.	83	2.0	84	2.8	83	2.6
J05	Yes	Identify type of solar radiation that causes sunburn.	66	2.8	69	3.4	64	4.0
K13	Yes	Identify electrical conductors that form complete circuits.	91	1.5	95	1.8	87	2.5
K14	Yes	Relate evaporation rate to surface area.	89	1.4	91	1.8	86	2.7
K17	Yes	Relate presence of gravitational force to position of falling object.	72	2.5	73	3.1	71	3.8
L01	Yes	Select diagram showing forces resulting in rotation.	63	2.6	70	3.9	56	4.2
L04	Yes	Explain most efficient engine.	48	2.8	50	3.8	45	3.6
L07	Yes	Relate sound transmission to air.	73	2.2	73	3.7	73	3.2
M12	Yes	Complete table of voltage/current data for circuit.	55	2.8	63	3.5	46	3.7
M14	Yes	Draw reflected image of object.	76	2.1	77	2.7	74	3.0
N08	Yes	Relate lever arm lengths to balanced weights.	67	2.6	75	2.7	59	4.2
N10	Yes	Determine effect of tipping container on water surface.	56	2.5	68	3.4	45	3.4
O10	Yes	Identify polarity of ends of cut magnet.	76	2.6	77	3.2	74	3.3
O13	Yes	Relate circular motion to centripetal force.	66	2.3	76	2.4	56	3.5
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	86	1.9	89	2.4	84	2.6
P02	Yes	Explain relationship between illuminance and distance of light source.	28	2.4	34	3.3	24	3.2
P05	Yes	Explain why balloon expands upon heating.	72	2.6	84	2.7	62	4.0
Q12	Yes	Explain how focusing affects the amount of light.	43	3.1	51	4.6	37	3.7
Q13	Yes	Compare heat expansion properties of metal and glass.	62	2.9	67	3.9	58	3.9
Q18	Yes	Explain effect of melting on the mass of ice cubes.	32	2.3	39	3.9	27	3.1
R01	Yes	Choose diagram showing angle of reflected light.	78	2.2	80	2.7	76	3.0
R02	Yes	Identify reflection/absorption properties from color.	37	2.7	38	4.1	36	3.7
Y01	Yes	Explain amount of light/electric energy in a lamp.	17	1.7	19	2.2	14	2.1
Y02	Yes	Explain temperature of melting snowball.	18	2.0	19	2.1	18	2.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Denmark SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	68	1.8	73	1.9	63	2.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	69	2.1	69	2.6	69	2.7
F06	No	Relate rusting iron to the presence of oxygen and moisture.	62	1.8	66	2.6	59	2.8
G10	No	Select correct statement regarding the atomic makeup of matter.	38	1.9	47	2.3	29	2.9
H06	No	Know if wood-burning reaction absorbs or releases energy.	18	1.6	22	2.2	14	1.7
J03	Yes	Know relationship between molecules, atoms and cells.	29	2.8	30	4.8	27	3.5
J04	Yes	Distiguish between a chemical reaction and a physical change.	14	2.2	11	2.5	16	3.4
J06	Yes	Know what happens to atoms in animal after death.	19	2.9	24	4.3	14	3.4
J08	Yes	Identify gas involved in fire ignition.	59	3.1	59	4.4	58	4.2
M10	Yes	Identify substances which are mixtures.	56	3.5	51	5.0	60	4.8
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	23	2.6	31	4.0	15	3.5
N07	Yes	Explain oxygen fuel requirements of burning candle.	97	1.0	97	1.3	97	1.6
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	34	3.2	39	4.6	29	4.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	26	3.1	27	3.8	24	4.3
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	17	2.2	18	3.3	15	3.3
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	35	3.6	39	4.9	31	4.4
Q15	Yes	Determine physical processes involving chemical change.	32	3.1	33	4.0	31	4.8
R05	Yes	Explain how carbon dioxide fire extinguishers work.	33	3.0	40	4.7	25	4.0
Z01A	Yes	Explain why steel bridges must be painted.	55	3.1	57	4.5	53	4.7
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	48	3.3	52	4.5	43	4.9
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	27	3.0	34	4.5	22	3.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Denmark SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	63	1.3	65	1.8	62	1.7
B01	No	Identify hottest layer of the Earth.	92	1.0	96	0.9	88	1.5
B05	No	Use elevation/weather diagram to locate earth feature.	47	1.8	47	2.7	47	2.5
C07	No	Relate mountain shape to age.	38	2.0	46	2.7	30	2.5
D03	No	Identify direction of river flow on contour map.	44	2.0	53	2.6	36	2.6
E09	No	Use table of time/temperature to determine point when weather changes.	86	1.4	86	2.0	87	1.6
E12	No	Identify type of stone involved in cave formation.	39	2.1	42	2.5	37	3.0
F05	No	Relate level of oxygen to elevation.	79	1.6	82	2.2	77	2.4
G11	No	Identify type of rock from description of its formation.	20	1.7	23	2.4	17	2.1
H03	No	Select explanation for moonlight.	77	1.6	82	1.9	72	2.5
H04	No	Identify ground layer containing the most organic material.	43	1.8	51	2.7	36	2.4
I17	Yes	Know energy source for Earth’s water cycle.	29	3.0	29	4.5	29	4.0
J01	Yes	Know changes in Earth’s surface over billions of years.	35	3.2	39	4.5	32	3.9
K15	Yes	Know organic origins of fossil fuels.	46	3.2	56	4.7	39	4.6
O12	Yes	Know relative amounts of components in air.	11	1.8	12	2.7	9	2.5
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	71	2.8	72	3.6	69	4.2
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	67	3.0	75	3.5	57	5.0
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	30	3.2	35	4.2	25	4.0
Q16	Yes	Estimate time for light from star to reach Earth.	36	3.4	41	4.2	30	4.9
R04	Yes	Give reason why ozone layer is important for life.	29	3.1	37	4.9	20	3.9
W01A	Yes	Give reason region in land/water diagram is a good farming location.	62	2.2	69	2.6	56	3.3
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	29	2.3	29	3.1	29	3.2
W02	Yes	Draw diagram showing Earth’s water cycle.	39	2.3	46	3.4	33	3.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Denmark SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	46	1.4	53	1.5	40	2.0
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	41	2.0	50	2.7	33	2.7
F04	No	Predict type of area where soil erosion by rain is most likely.	70	1.6	78	1.9	63	2.5
G12	No	Identify a nonrenewable natural resource.	50	2.0	52	2.7	48	3.0
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	41	4.2	43	5.1	38	5.4
I13	Yes	Select best scale for accurate measurement.	60	3.4	62	4.6	59	4.5
I15	Yes	Identify the type of scientific statement given in an experimental report.	39	3.4	45	4.8	33	4.7
I18	Yes	Write conclusion from summary of experimental observations.	19	3.2	18	3.6	19	4.3
K19	Yes	Write an example of how computers are used to do work.	76	2.6	76	3.7	75	3.6
N01	Yes	Determine correct control experiment to test hypothesis.	36	3.6	39	5.3	34	4.2
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	61	3.4	60	5.1	62	4.3
N05	Yes	Identify a principal cause of acid rain.	27	2.6	29	4.2	24	3.3
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	58	3.1	58	4.3	59	4.6
Z02A	Yes	Write a reason why not all people have enough water.	51	3.4	55	4.1	48	5.1
Z02B	Yes	Write a second reason why not all people have enough water.	27	3.1	30	4.7	25	4.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Denmark SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	60	1.6	57	2.1	62	2.1
B04	No	Predict pulse/breathing rate change after exercise.	91	1.1	92	1.1	89	1.9
C08	No	Identify carrier of signals from eye to brain.	55	2.1	58	2.6	53	3.3
D05	No	Identify system carrying sensory messages to the brain.	63	1.7	66	2.1	59	2.7
D06	No	Relate plant part to seed development.	85	1.3	88	1.5	83	2.0
E08	No	Select correct statement of trait heredity from parents.	82	1.4	81	2.0	83	2.3
E10	No	Determine characteristics for classifying animals.	52	2.3	56	2.9	48	2.7
F01	No	Identify characteristic of mammal.	72	1.9	71	2.5	73	2.6
F03	No	Identify human organ which interprets senses.	54	1.7	60	2.9	48	2.4
G08	No	Identify main function of red blood cells.	43	1.9	45	2.4	40	2.7
G09	No	Identify reproductive cells involved in heredity.	78	1.6	78	2.0	77	2.3
H01	No	Identify the functions of blood.	72	1.6	72	2.5	73	1.9
H02	No	Identify the role of vitamins.	68	1.6	69	2.5	68	2.4
I10	Yes	Identify nutrition content of fruits and vegetables.	81	2.2	77	4.0	86	3.4
I11	Yes	Know identifying features of insects.	41	3.4	42	4.1	40	4.9
I14	Yes	Relate elbow action to a simple machine.	39	3.2	45	5.2	34	4.4
I19	Yes	Identify statement of oxygen production consistent with data.	46	3.1	50	4.0	42	5.3
J02	Yes	Choose species on Earth for shortest time.	87	2.2	90	2.7	83	3.0
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	39	2.8	46	4.3	33	4.0
J09	Yes	Explain how to determine the age of a cut tree.	91	1.8	91	2.7	91	2.5
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	41	3.2	43	5.0	41	4.0
K12	Yes	Relate reproductive cell production to population.	40	3.3	39	4.9	41	4.1
K16	Yes	Identify common product made with bacteria.	27	3.3	32	4.3	23	4.3
K18	Yes	Identify main function of chloroplasts in plant cell.	60	3.3	59	4.7	60	3.8
L02	Yes	Select reason why algae are close to ocean surface.	55	3.5	59	4.4	51	4.9
L03	Yes	Identify skull features typical of predators.	67	3.7	74	4.1	62	5.1
L05	Yes	Select most likely purpose for birds' singing.	75	2.6	75	4.1	76	3.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	40	2.8	36	4.4	44	3.8
M11	Yes	Complete a food web showing energy relationships.	64	2.6	67	3.9	60	4.1
N02	Yes	Choose meal which would give the most nutrients.	54	3.3	44	4.8	63	4.3
N04	Yes	Identify how decaying fish fertilize plants.	35	3.2	36	3.9	35	4.3
N06	Yes	Identify the most basic unit of living things.	64	3.4	70	4.3	58	4.8
O16	Yes	Give reason for thirst on a hot day.	69	2.9	69	4.0	69	4.6
O17	Yes	Describe how disease may be transmitted.	76	2.8	76	3.7	77	4.2
P04	Yes	Identify what happens to animals' biological processes during hibernation.	48	2.8	48	4.0	48	5.2
P06	Yes	Describe digestion occuring in the mouth.	35	3.1	39	4.7	32	4.9
Q17	Yes	Describe the advantage of having two eyes.	61	3.4	59	4.4	64	4.8
R03	Yes	Give example of consequences of introducing new species.	8	1.8	9	2.5	6	2.3
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	12	1.8	11	2.3	13	2.4
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	69	2.4	71	3.4	69	2.9
X02B	Yes	Explain why light is important in aquarium ecosystem.	32	2.1	38	3.2	27	2.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Denmark SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	66	1.3	68	1.6	65	1.8
A10	No	Relate light level and reflectance to vision of object.	64	1.2	68	1.8	60	1.7
B02	No	Know type of energy released from combustion engine.	45	1.9	49	2.5	41	2.6
B03	No	Determine density from mass/volume table.	21	1.5	26	2.1	15	2.0
B06	No	Relate color of object to amount of light reflection.	80	1.3	82	1.8	78	1.9
C09	No	Identify correct position of reflected image.	75	1.8	78	2.6	73	2.2
C12	No	Identify substance which is NOT a fossil fuel.	37	1.8	43	2.7	31	2.4
D01	No	Identify correct diagram of light rays through lens.	46	2.2	57	3.0	34	2.9
D02	No	Identify substance from magnetic properties.	63	1.8	67	2.4	59	2.8
D04	No	Relate physical event to its sequence of energy changes.	51	2.1	54	2.7	47	3.0
E07	No	Identify particles found in the nucleus of atoms.	28	1.7	36	2.7	22	2.1
E11	No	Find shadow size from diagram of bulb/card/screen distances.	53	2.0	59	2.7	48	2.4
F02	No	Relate color and light reflection to temperature of object.	72	1.4	78	2.4	67	2.1
G07	No	Identify correct way to place batteries in a flashlight.	92	1.0	94	1.3	91	1.6
H05	No	Identify source of energy stored in food.	16	1.8	18	2.4	15	2.2
I16	Yes	Identify material with greatest heat conductivity.	74	2.5	73	3.6	77	3.4
J05	Yes	Identify type of solar radiation that causes sunburn.	70	3.2	76	3.5	63	4.8
K10	Yes	Describe a method demonstrating the existence of air.	45	3.8	45	4.2	44	5.2
K13	Yes	Identify electrical conductors that form complete circuits.	74	2.9	81	3.7	68	4.3
K14	Yes	Relate evaporation rate to surface area.	76	2.1	78	3.5	74	3.8
K17	Yes	Relate presence of gravitational force to position of falling object.	51	3.3	53	4.3	49	4.7
L01	Yes	Select diagram showing forces resulting in rotation.	43	3.2	49	4.5	37	4.3
L04	Yes	Explain most efficient engine.	36	3.3	40	4.9	33	4.3
L07	Yes	Relate sound transmission to air.	60	3.0	66	4.5	57	3.8
M12	Yes	Complete table of voltage/current data for circuit.	50	3.5	61	5.0	39	4.8
M14	Yes	Draw reflected image of object.	75	3.2	76	3.6	74	4.6
N08	Yes	Relate lever arm lengths to balanced weights.	73	2.8	76	3.6	71	4.2
N10	Yes	Determine effect of tipping container on water surface.	65	3.2	75	4.5	55	4.0
O10	Yes	Identify polarity of ends of cut magnet.	53	3.7	52	4.0	55	5.3
O13	Yes	Relate circular motion to centripetal force.	62	3.1	70	4.2	51	4.4
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	86	2.0	88	2.6	83	3.2
P02	Yes	Explain relationship between illuminance and distance of light source.	26	2.7	28	3.6	24	3.9
P05	Yes	Explain why balloon expands upon heating.	55	3.1	57	4.2	52	5.1
Q12	Yes	Explain how focusing affects the amount of light.	37	3.2	47	4.1	27	4.5
Q13	Yes	Compare heat expansion properties of metal and glass.	66	3.5	68	4.7	64	4.6
Q18	Yes	Explain effect of melting on the mass of ice cubes.	31	2.7	33	4.1	30	4.1
R01	Yes	Choose diagram showing angle of reflected light.	65	3.0	72	3.6	57	4.8
R02	Yes	Identify reflection/absorption properties from color.	27	2.7	31	4.2	22	3.8
Y01	Yes	Explain amount of light/electric energy in a lamp.	2	0.6	3	1.2	2	0.7
Y02	Yes	Explain temperature of melting snowball.	11	1.4	9	1.9	13	2.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=France SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	78	1.4	81	1.5	76	1.8
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	86	1.2	86	1.8	85	1.6
F06	No	Relate rusting iron to the presence of oxygen and moisture.	71	1.7	74	2.3	69	1.9
G10	No	Select correct statement regarding the atomic makeup of matter.	48	1.8	51	2.4	45	2.8
H06	No	Know if wood-burning reaction absorbs or releases energy.	51	1.6	61	2.2	43	2.2
J03	Yes	Know relationship between molecules, atoms and cells.	25	2.6	24	3.1	25	3.5
J04	Yes	Distiguish between a chemical reaction and a physical change.	44	3.2	41	3.9	46	4.5
J06	Yes	Know what happens to atoms in animal after death.	14	1.8	15	2.7	13	2.8
J08	Yes	Identify gas involved in fire ignition.	33	2.6	42	3.2	22	3.3
M10	Yes	Identify substances which are mixtures.	60	2.9	62	3.7	56	4.7
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	66	2.3	67	3.5	63	4.1
N07	Yes	Explain oxygen fuel requirements of burning candle.	86	2.0	89	2.6	83	3.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	50	3.1	52	4.5	49	4.2
O11	Yes	Identify which change in elemental form is due to a chemical change.	37	2.7	42	3.8	33	4.0
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	40	3.6	40	5.1	39	4.2
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	15	2.1	10	2.3	21	3.5
Q15	Yes	Determine physical processes involving chemical change.	19	2.8	23	4.2	14	2.6
R05	Yes	Explain how carbon dioxide fire extinguishers work.	50	3.6	53	5.3	47	4.0
Z01A	Yes	Explain why steel bridges must be painted.	58	2.6	62	3.9	55	4.2
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	41	2.3	43	4.0	42	3.7
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	19	2.2	20	3.4	19	3.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=France SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	58	1.0	59	1.4	57	1.5
B01	No	Identify hottest layer of the Earth.	91	0.7	94	1.0	89	1.0
B05	No	Use elevation/weather diagram to locate earth feature.	46	1.5	45	1.9	47	2.2
C07	No	Relate mountain shape to age.	71	2.0	76	2.5	65	2.9
D03	No	Identify direction of river flow on contour map.	36	2.1	40	2.5	33	2.9
E09	No	Use table of time/temperature to determine point when weather changes.	94	0.9	95	1.3	94	1.2
E12	No	Identify type of stone involved in cave formation.	61	1.5	66	2.4	55	1.9
F05	No	Relate level of oxygen to elevation.	69	1.6	70	2.2	67	2.3
G11	No	Identify type of rock from description of its formation.	64	1.8	63	2.7	64	2.4
H03	No	Select explanation for moonlight.	76	1.4	79	2.2	74	2.2
H04	No	Identify ground layer containing the most organic material.	44	1.5	47	2.3	44	2.2
I17	Yes	Know energy source for Earth’s water cycle.	38	2.9	35	3.6	41	4.2
J01	Yes	Know changes in Earth’s surface over billions of years.	59	2.5	59	3.7	60	3.6
K15	Yes	Know organic origins of fossil fuels.	61	2.1	63	3.6	61	3.2
O12	Yes	Know relative amounts of components in air.	13	2.0	17	2.9	10	2.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	54	2.9	65	3.7	45	4.3
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	86	2.1	85	3.0	88	3.3
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	31	2.4	38	2.9	22	3.7
Q16	Yes	Estimate time for light from star to reach Earth.	19	2.2	26	3.4	13	2.4
R04	Yes	Give reason why ozone layer is important for life.	42	3.0	47	4.6	37	4.1
W01A	Yes	Give reason region in land/water diagram is a good farming location.	76	1.8	73	2.6	78	2.7
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	37	2.4	35	2.9	38	3.5
W02	Yes	Draw diagram showing Earth’s water cycle.	32	1.9	35	2.9	30	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=France SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	41	1.3	43	1.4	38	1.8
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	41	2.0	46	2.5	37	3.0
F04	No	Predict type of area where soil erosion by rain is most likely.	62	1.7	66	2.0	56	2.8
G12	No	Identify a nonrenewable natural resource.	42	1.7	46	2.1	38	2.5
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	38	3.2	41	4.2	35	4.8
I13	Yes	Select best scale for accurate measurement.	75	2.3	78	3.2	72	3.6
I15	Yes	Identify the type of scientific statement given in an experimental report.	71	3.0	74	3.9	69	4.4
I18	Yes	Write conclusion from summary of experimental observations.	53	3.4	50	4.6	56	4.4
K19	Yes	Write an example of how computers are used to do work.	69	2.6	65	4.4	72	3.7
N01	Yes	Determine correct control experiment to test hypothesis.	43	2.6	42	3.9	46	3.5
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	75	2.3	76	3.8	76	3.6
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	51	2.6	47	3.8	55	3.5
Z02A	Yes	Write a reason why not all people have enough water.	63	2.7	61	4.3	66	3.8
Z02B	Yes	Write a second reason why not all people have enough water.	39	2.7	37	3.9	42	3.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=France SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	52	1.4	53	1.8	49	1.9
B04	No	Predict pulse/breathing rate change after exercise.	93	0.7	92	1.1	93	1.0
C08	No	Identify carrier of signals from eye to brain.	71	2.0	73	2.2	68	2.9
D05	No	Identify system carrying sensory messages to the brain.	63	1.4	65	2.0	61	1.9
D06	No	Relate plant part to seed development.	69	1.9	70	2.2	69	2.7
E08	No	Select correct statement of trait heredity from parents.	77	1.4	75	1.8	80	2.0
E10	No	Determine characteristics for classifying animals.	60	1.8	60	2.3	60	2.1
F01	No	Identify characteristic of mammal.	62	1.6	63	2.2	60	2.3
F03	No	Identify human organ which interprets senses.	75	1.7	76	2.4	74	2.4
G08	No	Identify main function of red blood cells.	66	1.6	72	1.9	60	2.1
G09	No	Identify reproductive cells involved in heredity.	87	1.0	84	1.7	89	1.3
H01	No	Identify the functions of blood.	66	1.6	67	2.5	66	1.7
H02	No	Identify the role of vitamins.	70	1.3	74	1.8	67	2.1
I10	Yes	Identify nutrition content of fruits and vegetables.	60	3.1	63	4.2	57	4.5
I11	Yes	Know identifying features of insects.	35	2.8	39	4.1	32	3.5
I14	Yes	Relate elbow action to a simple machine.	67	2.9	70	4.2	64	3.9
I19	Yes	Identify statement of oxygen production consistent with data.	62	3.3	63	4.2	63	4.1
J02	Yes	Choose species on Earth for shortest time.	83	2.0	85	2.4	81	3.2
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	65	2.7	69	3.2	61	4.0
J09	Yes	Explain how to determine the age of a cut tree.	66	2.5	69	3.2	63	3.6
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	54	2.9	57	3.6	50	4.4
K12	Yes	Relate reproductive cell production to population.	64	2.7	65	3.5	65	4.2
K16	Yes	Identify common product made with bacteria.	20	2.5	20	3.6	18	3.4
K18	Yes	Identify main function of chloroplasts in plant cell.	48	3.0	48	4.0	48	4.0
L02	Yes	Select reason why algae are close to ocean surface.	59	2.6	63	3.1	57	4.0
L03	Yes	Identify skull features typical of predators.	72	2.7	72	3.7	73	4.0
L05	Yes	Select most likely purpose for birds' singing.	74	2.6	77	3.3	72	3.9
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	61	3.1	65	4.1	59	4.1
M11	Yes	Complete a food web showing energy relationships.	72	2.7	72	3.2	72	3.9
N02	Yes	Choose meal which would give the most nutrients.	38	2.5	31	4.1	45	3.9
N04	Yes	Identify how decaying fish fertilize plants.	61	3.1	63	3.9	61	4.4
N06	Yes	Identify the most basic unit of living things.	35	2.7	36	4.2	36	3.9
O16	Yes	Give reason for thirst on a hot day.	38	3.0	43	4.6	34	3.3
O17	Yes	Describe how disease may be transmitted.	48	3.1	36	4.3	59	3.8
P04	Yes	Identify what happens to animals' biological processes during hibernation.	66	2.9	70	4.1	62	3.4
P06	Yes	Describe digestion occuring in the mouth.	22	2.5	23	3.4	22	3.5
Q17	Yes	Describe the advantage of having two eyes.	73	2.7	77	3.5	68	4.4
R03	Yes	Give example of consequences of introducing new species.	6	1.2	5	1.4	6	1.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	9	1.2	10	1.7	10	1.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	63	1.7	65	2.2	61	2.9
X02B	Yes	Explain why light is important in aquarium ecosystem.	27	2.0	30	2.6	25	2.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=France SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	71	1.2	74	1.6	69	1.7
A10	No	Relate light level and reflectance to vision of object.	68	1.1	69	1.4	65	1.6
B02	No	Know type of energy released from combustion engine.	55	1.3	58	1.8	54	1.9
B03	No	Determine density from mass/volume table.	16	1.2	19	1.6	12	1.2
B06	No	Relate color of object to amount of light reflection.	87	1.1	87	1.7	86	1.3
C09	No	Identify correct position of reflected image.	83	1.1	82	1.6	84	1.8
C12	No	Identify substance which is NOT a fossil fuel.	28	1.3	30	2.0	26	2.2
D01	No	Identify correct diagram of light rays through lens.	32	2.0	36	2.7	29	2.4
D02	No	Identify substance from magnetic properties.	70	1.9	74	2.5	66	2.9
D04	No	Relate physical event to its sequence of energy changes.	51	1.9	56	2.2	45	2.9
E07	No	Identify particles found in the nucleus of atoms.	20	1.7	25	2.3	17	2.0
E11	No	Find shadow size from diagram of bulb/card/screen distances.	60	1.7	62	2.3	60	2.4
F02	No	Relate color and light reflection to temperature of object.	64	1.7	69	2.5	61	2.3
G07	No	Identify correct way to place batteries in a flashlight.	89	0.9	91	1.4	88	1.5
H05	No	Identify source of energy stored in food.	6	0.8	7	1.3	6	1.0
I16	Yes	Identify material with greatest heat conductivity.	81	2.2	81	3.0	82	3.0
J05	Yes	Identify type of solar radiation that causes sunburn.	69	2.3	74	3.0	64	3.4
K10	Yes	Describe a method demonstrating the existence of air.	23	2.3	22	3.3	25	3.1
K13	Yes	Identify electrical conductors that form complete circuits.	79	1.9	79	3.3	79	3.2
K14	Yes	Relate evaporation rate to surface area.	85	2.2	86	3.3	84	3.0
K17	Yes	Relate presence of gravitational force to position of falling object.	51	3.0	55	4.4	46	3.7
L01	Yes	Select diagram showing forces resulting in rotation.	51	2.7	61	4.2	42	3.2
L04	Yes	Explain most efficient engine.	29	2.4	31	3.5	29	3.9
L07	Yes	Relate sound transmission to air.	72	2.4	73	3.7	72	3.0
M12	Yes	Complete table of voltage/current data for circuit.	70	2.7	76	3.0	64	4.3
M14	Yes	Draw reflected image of object.	78	2.3	78	3.2	78	3.5
N08	Yes	Relate lever arm lengths to balanced weights.	70	2.4	74	3.4	68	3.5
N10	Yes	Determine effect of tipping container on water surface.	56	2.7	65	3.4	51	3.9
O10	Yes	Identify polarity of ends of cut magnet.	47	3.0	51	4.4	47	4.3
O13	Yes	Relate circular motion to centripetal force.	60	2.8	66	4.4	54	3.2
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	97	0.9	97	1.4	97	1.3
P02	Yes	Explain relationship between illuminance and distance of light source.	19	2.3	20	2.8	17	3.0
P05	Yes	Explain why balloon expands upon heating.	68	2.6	70	4.3	67	3.8
Q12	Yes	Explain how focusing affects the amount of light.	46	2.7	49	4.1	41	3.5
Q13	Yes	Compare heat expansion properties of metal and glass.	46	3.1	50	4.4	42	4.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	51	3.1	51	3.7	50	4.3
R01	Yes	Choose diagram showing angle of reflected light.	71	2.5	76	3.1	66	4.2
R02	Yes	Identify reflection/absorption properties from color.	37	2.5	37	3.4	37	3.9
Y01	Yes	Explain amount of light/electric energy in a lamp.	1	0.4	2	0.7	1	0.5
Y02	Yes	Explain temperature of melting snowball.	18	1.5	16	2.0	20	2.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Germany SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	80	1.3	83	1.5	77	1.9
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	84	1.4	85	1.9	84	1.6
F06	No	Relate rusting iron to the presence of oxygen and moisture.	76	1.4	80	2.1	74	2.0
G10	No	Select correct statement regarding the atomic makeup of matter.	62	2.1	69	3.0	55	2.3
H06	No	Know if wood-burning reaction absorbs or releases energy.	71	1.7	78	2.1	64	2.5
J03	Yes	Know relationship between molecules, atoms and cells.	21	2.5	24	3.6	17	3.1
J04	Yes	Distiguish between a chemical reaction and a physical change.	38	3.6	37	4.1	40	5.0
J06	Yes	Know what happens to atoms in animal after death.	24	2.7	26	4.5	20	2.9
J08	Yes	Identify gas involved in fire ignition.	56	3.4	64	4.0	49	4.6
M10	Yes	Identify substances which are mixtures.	65	2.8	67	4.3	65	4.4
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	64	2.8	73	4.2	56	3.8
N07	Yes	Explain oxygen fuel requirements of burning candle.	92	2.0	90	3.5	93	2.0
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	59	2.9	57	4.4	61	4.3
O11	Yes	Identify which change in elemental form is due to a chemical change.	43	3.1	47	4.2	37	3.9
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	37	4.0	34	4.3	42	5.4
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	47	3.5	49	4.7	46	4.7
Q15	Yes	Determine physical processes involving chemical change.	25	2.7	25	3.8	24	3.7
R05	Yes	Explain how carbon dioxide fire extinguishers work.	69	3.0	75	3.9	66	4.4
Z01A	Yes	Explain why steel bridges must be painted.	64	3.1	64	4.2	67	4.5
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	43	3.3	45	4.8	42	4.5
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	23	2.6	23	3.9	23	3.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Germany SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	58	1.6	58	2.0	59	1.9
B01	No	Identify hottest layer of the Earth.	93	0.8	95	0.9	91	1.1
B05	No	Use elevation/weather diagram to locate earth feature.	56	2.0	55	2.5	57	2.3
C07	No	Relate mountain shape to age.	28	1.5	30	2.4	25	2.2
D03	No	Identify direction of river flow on contour map.	44	1.9	51	2.7	37	2.7
E09	No	Use table of time/temperature to determine point when weather changes.	81	1.4	81	1.6	82	2.0
E12	No	Identify type of stone involved in cave formation.	56	2.1	52	2.7	61	2.7
F05	No	Relate level of oxygen to elevation.	85	1.1	86	1.7	85	1.6
G11	No	Identify type of rock from description of its formation.	57	2.3	59	2.6	57	2.6
H03	No	Select explanation for moonlight.	88	1.3	93	1.4	83	1.8
H04	No	Identify ground layer containing the most organic material.	59	1.9	61	2.4	58	2.8
I17	Yes	Know energy source for Earth’s water cycle.	42	3.0	40	3.8	44	4.1
J01	Yes	Know changes in Earth’s surface over billions of years.	36	3.3	38	4.7	34	3.6
K15	Yes	Know organic origins of fossil fuels.	59	3.1	61	4.5	58	4.2
O12	Yes	Know relative amounts of components in air.	27	3.2	26	3.8	28	4.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	68	3.0	67	4.0	68	4.6
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	78	2.7	78	3.6	80	4.1
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	53	3.2	59	4.3	48	4.4
Q16	Yes	Estimate time for light from star to reach Earth.	30	3.3	32	4.3	29	4.4
R04	Yes	Give reason why ozone layer is important for life.	64	2.9	64	4.4	64	4.1
W01A	Yes	Give reason region in land/water diagram is a good farming location.	71	2.1	72	2.7	71	3.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	47	3.0	49	3.4	44	4.1
W02	Yes	Draw diagram showing Earth’s water cycle.	35	2.5	37	3.1	32	3.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Germany SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	59	1.8	62	2.0	57	2.3
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	40	1.9	42	2.9	38	2.4
F04	No	Predict type of area where soil erosion by rain is most likely.	68	1.9	73	2.5	63	2.3
G12	No	Identify a nonrenewable natural resource.	44	1.7	46	2.7	41	2.0
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	35	2.6	33	3.9	37	3.6
I13	Yes	Select best scale for accurate measurement.	68	3.1	65	4.5	71	4.1
I15	Yes	Identify the type of scientific statement given in an experimental report.	75	2.9	69	4.2	82	3.2
I18	Yes	Write conclusion from summary of experimental observations.	34	3.0	29	4.0	40	5.4
K19	Yes	Write an example of how computers are used to do work.	75	3.0	75	3.8	75	3.8
N01	Yes	Determine correct control experiment to test hypothesis.	42	2.8	33	3.7	49	4.5
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	60	3.1	59	4.9	61	4.1
N05	Yes	Identify a principal cause of acid rain.	40	2.8	46	3.9	35	3.6
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	33	2.9	33	4.5	34	4.1
Z02A	Yes	Write a reason why not all people have enough water.	61	2.9	59	4.4	63	4.2
Z02B	Yes	Write a second reason why not all people have enough water.	37	3.3	31	4.1	42	4.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Germany SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	76	1.4	72	1.6	81	1.9
B04	No	Predict pulse/breathing rate change after exercise.	93	0.7	93	1.0	94	0.9
C08	No	Identify carrier of signals from eye to brain.	79	1.8	80	2.3	79	2.0
D05	No	Identify system carrying sensory messages to the brain.	72	1.9	74	2.4	71	2.6
D06	No	Relate plant part to seed development.	85	1.5	86	1.6	84	2.1
E08	No	Select correct statement of trait heredity from parents.	89	1.3	86	1.7	91	1.5
E10	No	Determine characteristics for classifying animals.	56	1.9	62	2.5	52	2.6
F01	No	Identify characteristic of mammal.	69	1.7	70	2.4	68	2.4
F03	No	Identify human organ which interprets senses.	79	1.6	81	2.3	78	2.0
G08	No	Identify main function of red blood cells.	69	2.0	72	2.7	66	2.4
G09	No	Identify reproductive cells involved in heredity.	79	1.6	74	2.5	84	1.5
H01	No	Identify the functions of blood.	84	1.6	79	2.5	88	1.7
H02	No	Identify the role of vitamins.	82	1.6	81	2.1	83	2.2
I10	Yes	Identify nutrition content of fruits and vegetables.	87	2.1	81	3.5	94	1.9
I11	Yes	Know identifying features of insects.	54	3.1	57	4.2	50	4.2
I14	Yes	Relate elbow action to a simple machine.	68	3.0	66	4.5	70	4.3
I19	Yes	Identify statement of oxygen production consistent with data.	53	3.0	46	4.6	59	3.2
J02	Yes	Choose species on Earth for shortest time.	74	2.8	74	3.9	75	3.9
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	44	3.1	46	4.6	42	4.2
J09	Yes	Explain how to determine the age of a cut tree.	87	2.1	90	2.7	86	2.9
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	61	3.3	61	4.9	62	3.6
K12	Yes	Relate reproductive cell production to population.	49	2.8	53	3.6	46	4.1
K16	Yes	Identify common product made with bacteria.	38	3.0	37	4.4	39	3.6
K18	Yes	Identify main function of chloroplasts in plant cell.	60	3.4	56	5.1	64	4.3
L02	Yes	Select reason why algae are close to ocean surface.	65	2.3	71	3.4	61	3.5
L03	Yes	Identify skull features typical of predators.	82	2.0	88	2.8	78	3.2
L05	Yes	Select most likely purpose for birds' singing.	70	3.2	74	3.8	66	4.3
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	54	3.0	54	4.2	55	4.5
M11	Yes	Complete a food web showing energy relationships.	69	2.8	70	4.6	69	3.3
N02	Yes	Choose meal which would give the most nutrients.	46	2.9	42	3.9	51	4.7
N04	Yes	Identify how decaying fish fertilize plants.	41	3.0	46	4.5	36	4.2
N06	Yes	Identify the most basic unit of living things.	60	3.4	62	4.1	58	4.2
O16	Yes	Give reason for thirst on a hot day.	76	2.7	79	3.7	73	3.7
O17	Yes	Describe how disease may be transmitted.	54	3.0	51	3.8	57	4.5
P04	Yes	Identify what happens to animals' biological processes during hibernation.	72	3.2	74	4.0	72	4.2
P06	Yes	Describe digestion occuring in the mouth.	46	3.4	45	4.7	48	4.6
Q17	Yes	Describe the advantage of having two eyes.	45	3.2	47	4.5	43	4.4
R03	Yes	Give example of consequences of introducing new species.	10	2.0	10	2.7	10	2.3
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	16	2.0	16	2.4	17	2.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	74	2.3	74	3.1	75	2.5
X02B	Yes	Explain why light is important in aquarium ecosystem.	43	2.2	47	3.0	38	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Germany SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	71	1.4	71	1.9	71	1.7
A10	No	Relate light level and reflectance to vision of object.	69	1.3	69	1.7	69	1.5
B02	No	Know type of energy released from combustion engine.	58	1.5	61	2.3	56	2.6
B03	No	Determine density from mass/volume table.	33	1.7	36	2.2	29	2.2
B06	No	Relate color of object to amount of light reflection.	91	0.9	89	1.0	92	1.3
C09	No	Identify correct position of reflected image.	73	1.8	77	2.4	69	2.7
C12	No	Identify substance which is NOT a fossil fuel.	51	2.1	54	2.8	48	2.6
D01	No	Identify correct diagram of light rays through lens.	50	2.3	60	2.7	40	3.3
D02	No	Identify substance from magnetic properties.	88	1.3	93	1.4	83	2.0
D04	No	Relate physical event to its sequence of energy changes.	54	1.8	62	2.2	46	2.5
E07	No	Identify particles found in the nucleus of atoms.	28	2.1	29	3.2	27	2.7
E11	No	Find shadow size from diagram of bulb/card/screen distances.	54	1.6	58	2.6	52	2.1
F02	No	Relate color and light reflection to temperature of object.	80	1.9	83	2.6	76	2.5
G07	No	Identify correct way to place batteries in a flashlight.	86	1.4	84	2.4	88	1.5
H05	No	Identify source of energy stored in food.	25	2.1	24	2.6	24	2.6
I16	Yes	Identify material with greatest heat conductivity.	89	2.0	84	3.4	95	1.7
J05	Yes	Identify type of solar radiation that causes sunburn.	72	2.8	76	3.8	66	4.2
K10	Yes	Describe a method demonstrating the existence of air.	22	2.6	23	4.1	22	3.0
K13	Yes	Identify electrical conductors that form complete circuits.	83	2.7	87	4.0	80	3.3
K14	Yes	Relate evaporation rate to surface area.	83	2.6	82	4.0	84	3.5
K17	Yes	Relate presence of gravitational force to position of falling object.	55	3.2	57	5.0	55	4.3
L01	Yes	Select diagram showing forces resulting in rotation.	57	3.1	66	4.3	50	4.5
L04	Yes	Explain most efficient engine.	42	3.2	48	4.5	38	3.8
L07	Yes	Relate sound transmission to air.	74	2.4	81	3.5	67	3.6
M12	Yes	Complete table of voltage/current data for circuit.	69	2.8	70	3.9	67	4.1
M14	Yes	Draw reflected image of object.	71	2.8	74	3.2	69	3.8
N08	Yes	Relate lever arm lengths to balanced weights.	76	2.6	77	3.9	76	3.4
N10	Yes	Determine effect of tipping container on water surface.	61	3.0	69	4.2	55	4.5
O10	Yes	Identify polarity of ends of cut magnet.	69	2.7	70	3.7	68	4.1
O13	Yes	Relate circular motion to centripetal force.	67	3.0	75	3.5	59	4.4
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	84	2.3	88	2.7	83	3.1
P02	Yes	Explain relationship between illuminance and distance of light source.	22	2.9	24	3.6	21	4.0
P05	Yes	Explain why balloon expands upon heating.	55	3.2	60	3.7	52	4.6
Q12	Yes	Explain how focusing affects the amount of light.	44	2.8	49	4.0	41	4.1
Q13	Yes	Compare heat expansion properties of metal and glass.	74	2.3	71	4.0	80	3.0
Q18	Yes	Explain effect of melting on the mass of ice cubes.	24	3.1	25	3.7	24	3.9
R01	Yes	Choose diagram showing angle of reflected light.	78	2.7	79	3.8	78	3.4
R02	Yes	Identify reflection/absorption properties from color.	31	2.5	36	4.1	28	3.8
Y01	Yes	Explain amount of light/electric energy in a lamp.	9	1.3	11	2.1	7	1.1
Y02	Yes	Explain temperature of melting snowball.	14	1.5	11	1.9	16	1.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Greece SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	83	0.7	85	0.9	80	1.2
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	82	1.1	82	1.5	83	1.8
F06	No	Relate rusting iron to the presence of oxygen and moisture.	71	1.1	77	1.5	65	1.7
G10	No	Select correct statement regarding the atomic makeup of matter.	72	1.1	74	1.9	70	1.7
H06	No	Know if wood-burning reaction absorbs or releases energy.	54	1.6	58	2.0	50	2.1
J03	Yes	Know relationship between molecules, atoms and cells.	44	2.5	45	3.2	43	3.4
J04	Yes	Distiguish between a chemical reaction and a physical change.	52	2.8	53	3.5	50	3.7
J06	Yes	Know what happens to atoms in animal after death.	29	2.0	30	2.7	28	3.0
J08	Yes	Identify gas involved in fire ignition.	58	2.5	63	3.5	52	3.1
M10	Yes	Identify substances which are mixtures.	25	2.0	28	2.8	22	2.9
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	56	2.5	60	3.3	53	3.1
N07	Yes	Explain oxygen fuel requirements of burning candle.	86	1.8	88	2.1	84	2.8
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	38	2.3	43	3.5	33	3.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	25	2.0	27	2.8	24	2.8
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	53	2.6	57	3.4	50	3.5
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	56	2.7	53	3.5	60	3.4
Q15	Yes	Determine physical processes involving chemical change.	27	2.0	31	2.8	22	2.5
R05	Yes	Explain how carbon dioxide fire extinguishers work.	37	2.3	44	2.6	30	3.6
Z01A	Yes	Explain why steel bridges must be painted.	73	1.9	73	2.6	73	2.5
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	34	2.1	35	3.0	33	3.1
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	20	2.1	22	3.1	18	2.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Greece SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	54	0.9	57	1.2	51	1.3
B01	No	Identify hottest layer of the Earth.	94	0.7	96	0.7	92	1.1
B05	No	Use elevation/weather diagram to locate earth feature.	47	1.3	47	1.9	47	1.9
C07	No	Relate mountain shape to age.	26	1.9	29	2.4	22	2.1
D03	No	Identify direction of river flow on contour map.	22	1.4	26	1.8	18	1.6
E09	No	Use table of time/temperature to determine point when weather changes.	79	1.1	80	1.5	78	1.6
E12	No	Identify type of stone involved in cave formation.	44	1.7	47	2.2	41	2.0
F05	No	Relate level of oxygen to elevation.	78	1.3	81	1.8	74	1.7
G11	No	Identify type of rock from description of its formation.	61	1.8	59	2.2	62	2.3
H03	No	Select explanation for moonlight.	81	1.0	83	1.4	80	1.7
H04	No	Identify ground layer containing the most organic material.	45	1.6	48	2.0	42	2.2
I17	Yes	Know energy source for Earth’s water cycle.	48	2.6	50	3.6	46	3.2
J01	Yes	Know changes in Earth’s surface over billions of years.	27	2.4	29	3.3	25	3.1
K15	Yes	Know organic origins of fossil fuels.	29	2.6	32	3.8	25	3.1
O12	Yes	Know relative amounts of components in air.	34	2.7	38	3.5	29	3.2
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	42	2.2	50	3.2	32	3.3
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	78	1.9	75	3.0	82	2.7
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	45	2.6	53	3.6	36	4.2
R04	Yes	Give reason why ozone layer is important for life.	56	2.5	59	3.4	52	3.6
W01A	Yes	Give reason region in land/water diagram is a good farming location.	86	1.2	87	1.8	86	1.5
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	31	1.8	33	2.4	28	2.3
W02	Yes	Draw diagram showing Earth’s water cycle.	17	1.4	19	1.8	15	1.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Greece SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	68	1.0	70	1.1	65	1.3
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	32	1.3	35	1.9	28	2.1
F04	No	Predict type of area where soil erosion by rain is most likely.	84	1.5	83	1.9	84	1.8
G12	No	Identify a nonrenewable natural resource.	44	1.5	45	2.0	43	1.9
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	29	2.4	30	3.6	27	2.9
I13	Yes	Select best scale for accurate measurement.	69	2.4	71	2.9	68	3.3
I15	Yes	Identify the type of scientific statement given in an experimental report.	39	2.2	38	3.2	41	3.4
I18	Yes	Write conclusion from summary of experimental observations.	30	2.5	24	3.5	38	3.3
K19	Yes	Write an example of how computers are used to do work.	71	2.2	72	3.3	70	3.3
N01	Yes	Determine correct control experiment to test hypothesis.	44	2.3	43	3.2	46	3.1
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	57	2.5	57	3.2	56	3.7
N05	Yes	Identify a principal cause of acid rain.	21	1.9	23	3.0	20	2.8
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	63	3.3	64	3.3	63	5.0
Z02A	Yes	Write a reason why not all people have enough water.	67	2.6	64	3.6	70	3.3
Z02B	Yes	Write a second reason why not all people have enough water.	45	2.6	45	3.3	45	3.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Greece SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	78	0.8	74	1.3	83	1.1
B04	No	Predict pulse/breathing rate change after exercise.	90	1.0	91	1.0	88	2.1
C08	No	Identify carrier of signals from eye to brain.	63	1.8	66	2.6	60	2.6
D05	No	Identify system carrying sensory messages to the brain.	63	1.5	67	1.9	59	2.0
D06	No	Relate plant part to seed development.	40	1.3	41	1.8	40	1.9
E08	No	Select correct statement of trait heredity from parents.	81	0.9	79	1.4	82	1.4
E10	No	Determine characteristics for classifying animals.	62	1.5	63	2.1	61	1.8
F01	No	Identify characteristic of mammal.	72	1.2	75	1.6	70	1.9
F03	No	Identify human organ which interprets senses.	39	1.5	42	2.7	35	2.0
G08	No	Identify main function of red blood cells.	53	1.5	55	2.0	50	2.1
G09	No	Identify reproductive cells involved in heredity.	73	1.5	72	1.8	74	2.4
H01	No	Identify the functions of blood.	66	1.6	67	2.0	64	2.2
H02	No	Identify the role of vitamins.	72	1.9	70	2.6	73	1.8
I10	Yes	Identify nutrition content of fruits and vegetables.	31	2.1	30	2.6	33	3.1
I11	Yes	Know identifying features of insects.	44	2.6	51	3.5	36	3.7
I14	Yes	Relate elbow action to a simple machine.	54	2.7	58	3.5	49	3.6
I19	Yes	Identify statement of oxygen production consistent with data.	56	2.7	56	3.2	57	3.9
J02	Yes	Choose species on Earth for shortest time.	34	2.4	39	3.5	29	3.2
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	39	2.7	37	3.4	41	3.6
J09	Yes	Explain how to determine the age of a cut tree.	62	2.5	66	3.1	58	3.5
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	54	2.7	51	3.5	56	3.9
K12	Yes	Relate reproductive cell production to population.	60	2.6	62	3.6	57	3.7
K16	Yes	Identify common product made with bacteria.	24	2.1	27	2.7	22	3.2
K18	Yes	Identify main function of chloroplasts in plant cell.	52	2.8	54	4.0	50	3.9
L02	Yes	Select reason why algae are close to ocean surface.	60	2.2	65	2.6	55	3.5
L03	Yes	Identify skull features typical of predators.	74	2.1	74	3.1	73	3.3
L05	Yes	Select most likely purpose for birds' singing.	68	2.2	71	3.0	65	3.2
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	22	2.1	22	2.6	22	2.9
M11	Yes	Complete a food web showing energy relationships.	64	2.7	64	3.5	64	3.3
N02	Yes	Choose meal which would give the most nutrients.	37	2.4	33	3.0	42	3.4
N04	Yes	Identify how decaying fish fertilize plants.	72	2.3	74	2.7	70	3.8
N06	Yes	Identify the most basic unit of living things.	63	2.1	65	3.1	60	2.8
O16	Yes	Give reason for thirst on a hot day.	50	2.4	53	3.4	46	3.6
O17	Yes	Describe how disease may be transmitted.	77	2.4	72	3.0	83	2.8
P04	Yes	Identify what happens to animals' biological processes during hibernation.	38	2.3	42	3.7	34	3.3
P06	Yes	Describe digestion occuring in the mouth.	56	2.7	56	3.9	57	3.0
Q17	Yes	Describe the advantage of having two eyes.	64	2.4	63	3.2	64	3.3
R03	Yes	Give example of consequences of introducing new species.	14	2.0	17	2.6	11	2.5
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	10	1.0	8	1.2	13	1.5
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	47	1.6	45	2.5	48	2.4
X02B	Yes	Explain why light is important in aquarium ecosystem.	33	1.8	34	2.4	33	2.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Greece SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	70	1.2	70	1.4	71	1.7
A10	No	Relate light level and reflectance to vision of object.	67	0.9	67	1.2	68	1.1
B02	No	Know type of energy released from combustion engine.	67	1.6	64	1.7	71	2.3
B03	No	Determine density from mass/volume table.	23	1.4	25	1.9	20	1.5
B06	No	Relate color of object to amount of light reflection.	83	1.0	82	1.5	85	1.2
C09	No	Identify correct position of reflected image.	66	1.3	70	1.7	62	2.1
C12	No	Identify substance which is NOT a fossil fuel.	48	1.6	53	2.0	43	2.3
D01	No	Identify correct diagram of light rays through lens.	36	1.7	47	2.1	24	1.9
D02	No	Identify substance from magnetic properties.	66	1.5	70	1.8	62	2.1
D04	No	Relate physical event to its sequence of energy changes.	71	1.3	73	1.8	69	1.7
E07	No	Identify particles found in the nucleus of atoms.	59	1.5	59	2.2	60	2.1
E11	No	Find shadow size from diagram of bulb/card/screen distances.	59	1.7	59	2.1	60	2.2
F02	No	Relate color and light reflection to temperature of object.	60	1.3	65	1.6	55	2.0
G07	No	Identify correct way to place batteries in a flashlight.	84	1.0	88	1.0	80	1.9
H05	No	Identify source of energy stored in food.	12	1.0	12	1.1	13	1.5
I16	Yes	Identify material with greatest heat conductivity.	83	1.9	84	2.3	81	2.9
J05	Yes	Identify type of solar radiation that causes sunburn.	60	2.6	59	3.7	61	3.2
K10	Yes	Describe a method demonstrating the existence of air.	65	2.0	66	3.2	64	2.7
K13	Yes	Identify electrical conductors that form complete circuits.	69	2.4	79	2.7	60	3.7
K14	Yes	Relate evaporation rate to surface area.	82	1.9	87	2.6	77	2.8
K17	Yes	Relate presence of gravitational force to position of falling object.	30	2.2	32	3.1	28	3.1
L01	Yes	Select diagram showing forces resulting in rotation.	50	2.4	56	3.3	43	3.5
L04	Yes	Explain most efficient engine.	24	2.2	27	3.0	21	2.6
L07	Yes	Relate sound transmission to air.	82	1.8	81	2.9	84	2.2
M12	Yes	Complete table of voltage/current data for circuit.	59	2.4	64	3.5	54	3.4
M14	Yes	Draw reflected image of object.	63	2.4	65	3.2	62	3.3
N08	Yes	Relate lever arm lengths to balanced weights.	63	2.3	69	2.8	57	3.2
N10	Yes	Determine effect of tipping container on water surface.	49	2.4	58	3.2	40	3.2
O10	Yes	Identify polarity of ends of cut magnet.	54	2.2	55	3.3	53	3.2
O13	Yes	Relate circular motion to centripetal force.	59	2.3	62	3.0	55	3.5
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	71	2.3	76	2.8	67	3.2
P02	Yes	Explain relationship between illuminance and distance of light source.	28	2.7	27	3.3	29	3.5
P05	Yes	Explain why balloon expands upon heating.	64	2.2	71	3.0	56	3.8
Q12	Yes	Explain how focusing affects the amount of light.	54	2.6	57	3.0	50	3.9
Q13	Yes	Compare heat expansion properties of metal and glass.	40	2.2	45	3.2	34	2.9
Q18	Yes	Explain effect of melting on the mass of ice cubes.	17	2.0	16	2.3	17	2.8
R01	Yes	Choose diagram showing angle of reflected light.	75	2.4	75	2.7	74	4.0
R02	Yes	Identify reflection/absorption properties from color.	31	2.4	36	3.1	25	3.2
Y01	Yes	Explain amount of light/electric energy in a lamp.	7	1.1	6	1.3	8	1.5
Y02	Yes	Explain temperature of melting snowball.	8	0.9	9	1.3	7	1.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Hong Kong SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	85	1.2	88	1.1	81	1.6
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	66	1.7	68	1.8	64	2.4
F06	No	Relate rusting iron to the presence of oxygen and moisture.	79	1.6	83	1.9	74	1.8
G10	No	Select correct statement regarding the atomic makeup of matter.	44	2.0	49	2.3	38	2.7
H06	No	Know if wood-burning reaction absorbs or releases energy.	67	2.1	72	2.4	60	2.6
J03	Yes	Know relationship between molecules, atoms and cells.	32	2.5	35	3.9	29	2.8
J04	Yes	Distiguish between a chemical reaction and a physical change.	32	2.9	32	3.8	31	3.9
J06	Yes	Know what happens to atoms in animal after death.	34	2.3	37	3.4	30	3.1
J08	Yes	Identify gas involved in fire ignition.	82	2.5	86	3.2	78	3.9
M10	Yes	Identify substances which are mixtures.	36	2.4	39	3.7	33	3.1
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	82	2.1	83	3.0	81	2.7
N07	Yes	Explain oxygen fuel requirements of burning candle.	91	1.9	93	2.0	89	2.8
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	62	2.4	67	3.6	57	3.7
O11	Yes	Identify which change in elemental form is due to a chemical change.	53	2.8	54	3.8	51	3.6
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	58	2.2	62	3.2	52	3.9
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	44	2.4	45	3.2	42	3.4
Q15	Yes	Determine physical processes involving chemical change.	30	2.5	32	3.1	29	3.9
R05	Yes	Explain how carbon dioxide fire extinguishers work.	37	2.6	40	3.3	32	3.5
Z01A	Yes	Explain why steel bridges must be painted.	54	2.9	57	3.6	52	4.2
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	47	2.7	48	3.6	46	4.1
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	36	3.4	37	4.5	36	3.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Hong Kong SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	38	1.4	40	1.6	36	1.8
B01	No	Identify hottest layer of the Earth.	87	1.2	90	1.2	83	1.8
B05	No	Use elevation/weather diagram to locate earth feature.	42	1.6	44	2.1	40	2.2
C07	No	Relate mountain shape to age.	25	1.9	30	2.4	20	2.2
D03	No	Identify direction of river flow on contour map.	58	2.1	65	2.3	50	2.7
E09	No	Use table of time/temperature to determine point when weather changes.	86	1.4	87	1.8	84	1.9
E12	No	Identify type of stone involved in cave formation.	39	2.0	37	2.8	42	2.1
F05	No	Relate level of oxygen to elevation.	91	1.1	92	1.3	91	1.5
G11	No	Identify type of rock from description of its formation.	76	1.8	76	2.1	75	2.5
H03	No	Select explanation for moonlight.	94	0.8	96	0.8	92	1.4
H04	No	Identify ground layer containing the most organic material.	17	1.4	19	2.0	15	1.5
I17	Yes	Know energy source for Earth’s water cycle.	47	3.0	51	3.9	41	4.0
J01	Yes	Know changes in Earth’s surface over billions of years.	44	2.4	43	3.4	45	3.8
K15	Yes	Know organic origins of fossil fuels.	74	2.6	80	2.6	66	4.1
O12	Yes	Know relative amounts of components in air.	50	3.3	59	4.6	38	4.0
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	63	3.0	73	3.2	50	4.5
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	50	3.4	51	4.2	48	4.8
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	58	2.4	65	3.2	50	3.3
Q16	Yes	Estimate time for light from star to reach Earth.	25	2.2	22	3.2	29	3.7
R04	Yes	Give reason why ozone layer is important for life.	56	3.2	60	3.9	49	4.6
W01A	Yes	Give reason region in land/water diagram is a good farming location.	70	2.0	68	2.8	73	2.4
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	42	2.4	43	3.0	41	3.4
W02	Yes	Draw diagram showing Earth’s water cycle.	25	1.7	27	2.3	21	2.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Hong Kong SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	52	1.9	56	1.9	48	2.3
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	47	2.2	54	2.8	38	2.8
F04	No	Predict type of area where soil erosion by rain is most likely.	79	1.7	81	2.0	76	2.3
G12	No	Identify a nonrenewable natural resource.	65	1.8	69	2.2	60	2.3
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	42	2.7	48	3.6	34	3.5
I13	Yes	Select best scale for accurate measurement.	48	2.8	53	3.6	43	3.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	41	2.6	41	4.2	40	2.8
I18	Yes	Write conclusion from summary of experimental observations.	48	2.7	49	3.9	47	3.2
K19	Yes	Write an example of how computers are used to do work.	81	2.1	81	2.7	81	3.2
N01	Yes	Determine correct control experiment to test hypothesis.	57	2.7	59	3.6	54	4.0
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	68	2.6	70	3.4	65	3.7
N05	Yes	Identify a principal cause of acid rain.	38	2.6	35	3.0	41	3.6
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	70	2.5	65	3.5	78	3.4
Z02A	Yes	Write a reason why not all people have enough water.	56	3.1	59	4.0	52	4.2
Z02B	Yes	Write a second reason why not all people have enough water.	37	2.7	40	3.3	34	3.7

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Hong Kong SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	77	1.4	79	1.5	73	1.6
B04	No	Predict pulse/breathing rate change after exercise.	93	0.8	93	1.0	93	1.2
C08	No	Identify carrier of signals from eye to brain.	92	1.0	91	1.5	94	1.1
D05	No	Identify system carrying sensory messages to the brain.	50	2.0	56	2.6	42	2.6
D06	No	Relate plant part to seed development.	79	1.6	82	1.7	74	2.3
E08	No	Select correct statement of trait heredity from parents.	70	1.8	70	1.8	70	2.5
E10	No	Determine characteristics for classifying animals.	68	1.7	70	2.3	66	2.1
F01	No	Identify characteristic of mammal.	80	1.8	81	2.2	80	2.2
F03	No	Identify human organ which interprets senses.	88	1.1	89	1.3	87	1.7
G08	No	Identify main function of red blood cells.	59	2.0	69	2.6	49	2.2
G09	No	Identify reproductive cells involved in heredity.	90	1.3	89	1.7	91	1.5
H01	No	Identify the functions of blood.	81	1.3	81	1.7	81	1.9
H02	No	Identify the role of vitamins.	67	1.5	68	1.7	66	2.3
I10	Yes	Identify nutrition content of fruits and vegetables.	67	2.3	63	3.6	72	3.2
I11	Yes	Know identifying features of insects.	57	2.7	62	3.6	51	4.0
I14	Yes	Relate elbow action to a simple machine.	51	2.7	52	3.2	50	3.9
I19	Yes	Identify statement of oxygen production consistent with data.	49	2.9	49	3.1	49	4.4
J02	Yes	Choose species on Earth for shortest time.	56	2.9	64	3.8	47	3.9
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	71	2.4	73	3.4	69	3.3
J09	Yes	Explain how to determine the age of a cut tree.	39	2.5	41	2.9	38	3.4
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	69	2.1	70	2.4	68	3.5
K12	Yes	Relate reproductive cell production to population.	71	2.6	70	4.0	72	3.6
K16	Yes	Identify common product made with bacteria.	89	1.5	90	2.0	88	2.6
K18	Yes	Identify main function of chloroplasts in plant cell.	86	1.8	87	2.4	85	2.6
L02	Yes	Select reason why algae are close to ocean surface.	49	2.7	54	3.7	44	3.4
L03	Yes	Identify skull features typical of predators.	70	2.0	72	2.6	68	3.8
L05	Yes	Select most likely purpose for birds' singing.	38	2.8	43	3.0	33	3.8
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	71	2.3	73	2.8	68	3.3
M11	Yes	Complete a food web showing energy relationships.	81	2.7	85	2.8	76	4.1
N02	Yes	Choose meal which would give the most nutrients.	53	2.4	49	3.3	58	3.5
N04	Yes	Identify how decaying fish fertilize plants.	67	2.4	66	2.9	69	3.5
N06	Yes	Identify the most basic unit of living things.	83	2.2	86	2.8	79	3.2
O16	Yes	Give reason for thirst on a hot day.	82	2.2	82	2.4	83	3.3
O17	Yes	Describe how disease may be transmitted.	28	2.2	30	2.9	25	3.4
P04	Yes	Identify what happens to animals' biological processes during hibernation.	76	2.4	79	2.8	72	3.4
P06	Yes	Describe digestion occuring in the mouth.	30	2.4	32	3.3	27	3.3
Q17	Yes	Describe the advantage of having two eyes.	43	2.5	45	3.2	39	4.0
R03	Yes	Give example of consequences of introducing new species.	2	0.8	2	0.9	2	0.9
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	6	0.9	7	1.4	5	1.2
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	53	2.6	53	3.2	53	3.7
X02B	Yes	Explain why light is important in aquarium ecosystem.	26	2.0	29	2.8	22	2.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Hong Kong SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	64	1.1	67	1.3	59	1.5
A10	No	Relate light level and reflectance to vision of object.	71	1.3	76	1.6	64	1.6
B02	No	Know type of energy released from combustion engine.	46	1.3	45	1.5	47	2.1
B03	No	Determine density from mass/volume table.	49	1.8	53	2.2	44	2.1
B06	No	Relate color of object to amount of light reflection.	87	1.0	89	1.2	84	1.5
C09	No	Identify correct position of reflected image.	74	1.8	79	1.8	67	2.7
C12	No	Identify substance which is NOT a fossil fuel.	65	1.9	71	2.6	59	2.7
D01	No	Identify correct diagram of light rays through lens.	41	1.6	44	2.0	37	2.1
D02	No	Identify substance from magnetic properties.	78	1.4	82	1.4	72	2.2
D04	No	Relate physical event to its sequence of energy changes.	66	1.7	69	2.1	62	2.1
E07	No	Identify particles found in the nucleus of atoms.	32	1.5	34	1.8	30	1.8
E11	No	Find shadow size from diagram of bulb/card/screen distances.	58	1.4	61	2.2	55	2.0
F02	No	Relate color and light reflection to temperature of object.	80	1.7	84	1.9	76	2.8
G07	No	Identify correct way to place batteries in a flashlight.	93	0.6	94	0.9	92	1.1
H05	No	Identify source of energy stored in food.	35	1.6	36	2.0	34	2.1
I16	Yes	Identify material with greatest heat conductivity.	95	1.3	93	1.6	97	1.6
J05	Yes	Identify type of solar radiation that causes sunburn.	83	2.0	87	2.3	79	3.2
K10	Yes	Describe a method demonstrating the existence of air.	34	2.6	38	3.5	29	4.0
K13	Yes	Identify electrical conductors that form complete circuits.	88	1.7	92	1.9	84	2.6
K14	Yes	Relate evaporation rate to surface area.	89	1.6	88	2.1	91	2.1
K17	Yes	Relate presence of gravitational force to position of falling object.	74	2.2	76	3.2	72	3.0
L01	Yes	Select diagram showing forces resulting in rotation.	53	2.9	60	3.4	45	4.3
L04	Yes	Explain most efficient engine.	26	2.5	29	3.6	23	3.8
L07	Yes	Relate sound transmission to air.	81	2.2	84	2.5	76	3.0
M12	Yes	Complete table of voltage/current data for circuit.	73	3.2	77	3.6	68	3.9
M14	Yes	Draw reflected image of object.	81	1.9	85	2.0	77	3.2
N08	Yes	Relate lever arm lengths to balanced weights.	73	2.4	77	2.0	68	4.2
N10	Yes	Determine effect of tipping container on water surface.	71	2.8	82	3.0	56	4.1
O10	Yes	Identify polarity of ends of cut magnet.	63	2.9	67	3.4	57	3.9
O13	Yes	Relate circular motion to centripetal force.	58	3.0	63	3.3	51	4.3
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	89	1.7	91	2.1	86	2.8
P02	Yes	Explain relationship between illuminance and distance of light source.	17	2.2	20	3.2	13	2.5
P05	Yes	Explain why balloon expands upon heating.	40	3.0	42	3.5	39	4.9
Q12	Yes	Explain how focusing affects the amount of light.	37	2.4	43	3.4	31	3.5
Q13	Yes	Compare heat expansion properties of metal and glass.	63	2.9	68	3.4	56	4.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	19	2.3	20	3.0	17	3.2
R01	Yes	Choose diagram showing angle of reflected light.	72	2.7	77	3.3	66	4.4
R02	Yes	Identify reflection/absorption properties from color.	53	2.1	52	3.0	55	4.0
Y01	Yes	Explain amount of light/electric energy in a lamp.	7	1.3	10	1.9	4	1.5
Y02	Yes	Explain temperature of melting snowball.	5	0.9	5	1.2	4	1.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Hungary SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	86	0.8	89	1.0	83	1.1
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	92	1.0	92	1.3	93	1.2
F06	No	Relate rusting iron to the presence of oxygen and moisture.	82	1.6	86	1.8	78	2.2
G10	No	Select correct statement regarding the atomic makeup of matter.	61	1.7	65	2.4	56	2.4
H06	No	Know if wood-burning reaction absorbs or releases energy.	71	1.8	77	1.9	66	2.6
J03	Yes	Know relationship between molecules, atoms and cells.	42	3.1	40	4.4	43	4.3
J04	Yes	Distiguish between a chemical reaction and a physical change.	73	2.3	75	3.1	71	3.5
J06	Yes	Know what happens to atoms in animal after death.	46	2.8	46	3.8	47	3.8
J08	Yes	Identify gas involved in fire ignition.	33	2.7	28	3.4	38	4.0
M10	Yes	Identify substances which are mixtures.	42	2.9	42	4.1	41	4.0
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	61	2.5	67	3.9	53	3.8
N07	Yes	Explain oxygen fuel requirements of burning candle.	98	0.6	99	0.7	98	1.0
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	67	2.7	74	3.3	60	4.0
O11	Yes	Identify which change in elemental form is due to a chemical change.	43	3.0	44	3.9	42	4.3
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	73	2.7	75	3.8	71	3.4
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	52	2.6	49	3.8	54	3.6
Q15	Yes	Determine physical processes involving chemical change.	18	2.2	22	3.3	15	2.5
R05	Yes	Explain how carbon dioxide fire extinguishers work.	62	2.4	72	3.4	53	3.7
Z01A	Yes	Explain why steel bridges must be painted.	70	2.6	71	3.6	69	3.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Hungary SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	71	1.1	73	1.5	69	1.4
B01	No	Identify hottest layer of the Earth.	93	0.7	96	0.9	91	1.0
B05	No	Use elevation/weather diagram to locate earth feature.	68	1.5	71	1.9	66	2.1
C07	No	Relate mountain shape to age.	64	1.8	66	2.5	62	2.5
D03	No	Identify direction of river flow on contour map.	40	1.7	44	2.4	36	2.0
E09	No	Use table of time/temperature to determine point when weather changes.	89	1.1	90	1.3	88	1.7
E12	No	Identify type of stone involved in cave formation.	86	1.3	86	1.6	86	1.7
F05	No	Relate level of oxygen to elevation.	87	1.4	88	1.6	87	1.8
G11	No	Identify type of rock from description of its formation.	81	1.4	80	1.9	83	1.8
H03	No	Select explanation for moonlight.	81	1.4	86	1.7	75	2.2
H04	No	Identify ground layer containing the most organic material.	53	1.8	61	2.3	46	2.4
I17	Yes	Know energy source for Earth’s water cycle.	21	2.2	24	3.6	18	2.7
J01	Yes	Know changes in Earth’s surface over billions of years.	23	2.3	21	3.4	24	3.3
K15	Yes	Know organic origins of fossil fuels.	55	2.9	62	3.6	47	3.9
O12	Yes	Know relative amounts of components in air.	43	3.0	47	4.3	40	3.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	59	3.2	72	3.8	45	4.0
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	89	1.9	88	2.6	90	2.1
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	47	3.0	49	3.8	44	4.0
Q16	Yes	Estimate time for light from star to reach Earth.	17	1.9	18	3.1	16	2.7
R04	Yes	Give reason why ozone layer is important for life.	63	2.7	71	3.7	56	3.8
W01A	Yes	Give reason region in land/water diagram is a good farming location.	77	1.7	78	2.1	75	2.6
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	44	1.9	46	2.5	43	2.5
W02	Yes	Draw diagram showing Earth’s water cycle.	22	1.6	22	2.4	22	2.3

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Hungary SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	61	1.1	64	1.4	58	1.5
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	35	1.7	40	2.1	31	2.6
F04	No	Predict type of area where soil erosion by rain is most likely.	74	1.6	75	2.1	73	2.1
G12	No	Identify a nonrenewable natural resource.	41	1.9	50	2.3	31	2.5
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	48	2.8	52	4.2	44	3.7
I13	Yes	Select best scale for accurate measurement.	78	2.2	82	3.1	74	3.3
I15	Yes	Identify the type of scientific statement given in an experimental report.	79	2.2	78	3.2	79	3.1
I18	Yes	Write conclusion from summary of experimental observations.	30	2.6	32	3.7	29	3.7
K19	Yes	Write an example of how computers are used to do work.	78	2.4	81	3.0	76	3.4
N01	Yes	Determine correct control experiment to test hypothesis.	30	2.6	32	3.3	29	3.6
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	68	2.7	69	3.5	66	4.0
N05	Yes	Identify a principal cause of acid rain.	41	2.7	40	3.4	42	3.7
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	39	2.9	36	3.7	41	3.6
Z02A	Yes	Write a reason why not all people have enough water.	52	3.4	50	4.6	54	4.3
Z02B	Yes	Write a second reason why not all people have enough water.	46	2.9	44	3.8	47	4.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Hungary SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	81	0.8	78	1.3	84	1.2
B04	No	Predict pulse/breathing rate change after exercise.	90	0.8	90	1.2	89	1.1
C08	No	Identify carrier of signals from eye to brain.	86	1.3	85	2.0	87	1.4
D05	No	Identify system carrying sensory messages to the brain.	81	1.2	83	1.8	79	2.0
D06	No	Relate plant part to seed development.	88	1.1	89	1.6	87	1.7
E08	No	Select correct statement of trait heredity from parents.	89	0.9	85	1.5	92	1.2
E10	No	Determine characteristics for classifying animals.	46	1.7	49	2.2	43	2.4
F01	No	Identify characteristic of mammal.	77	1.6	75	2.1	78	2.2
F03	No	Identify human organ which interprets senses.	76	1.3	77	1.7	75	1.9
G08	No	Identify main function of red blood cells.	70	1.7	70	2.2	69	2.3
G09	No	Identify reproductive cells involved in heredity.	91	1.1	90	1.6	93	1.3
H01	No	Identify the functions of blood.	79	1.4	75	2.3	82	1.8
H02	No	Identify the role of vitamins.	94	0.8	92	1.2	95	1.0
I10	Yes	Identify nutrition content of fruits and vegetables.	93	1.5	91	2.5	95	1.6
I11	Yes	Know identifying features of insects.	53	2.6	57	3.7	48	3.3
I14	Yes	Relate elbow action to a simple machine.	83	2.1	86	2.7	81	2.8
I19	Yes	Identify statement of oxygen production consistent with data.	62	2.5	62	3.6	61	3.6
J02	Yes	Choose species on Earth for shortest time.	61	2.7	62	3.7	61	3.9
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	50	3.1	49	4.3	52	3.8
J09	Yes	Explain how to determine the age of a cut tree.	81	2.4	86	2.4	76	3.4
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	65	2.8	68	3.5	61	4.3
K12	Yes	Relate reproductive cell production to population.	41	3.1	44	4.4	38	3.8
K16	Yes	Identify common product made with bacteria.	23	2.7	24	4.0	22	3.2
K18	Yes	Identify main function of chloroplasts in plant cell.	26	2.9	28	4.0	23	3.0
L02	Yes	Select reason why algae are close to ocean surface.	66	2.4	71	3.3	61	3.6
L03	Yes	Identify skull features typical of predators.	83	2.2	89	2.4	79	3.1
L05	Yes	Select most likely purpose for birds' singing.	75	2.4	79	2.9	72	3.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	70	2.7	66	4.0	73	3.7
M11	Yes	Complete a food web showing energy relationships.	81	2.2	83	2.8	79	3.6
N02	Yes	Choose meal which would give the most nutrients.	23	2.3	19	3.3	28	3.5
N04	Yes	Identify how decaying fish fertilize plants.	80	2.4	77	3.3	83	3.6
N06	Yes	Identify the most basic unit of living things.	73	1.9	71	3.5	74	3.2
O16	Yes	Give reason for thirst on a hot day.	64	3.0	66	4.3	62	4.3
O17	Yes	Describe how disease may be transmitted.	66	2.9	66	3.8	67	4.1
P04	Yes	Identify what happens to animals' biological processes during hibernation.	72	2.3	71	3.7	73	3.2
P06	Yes	Describe digestion occuring in the mouth.	51	2.8	53	3.9	50	3.7
Q17	Yes	Describe the advantage of having two eyes.	74	2.4	72	3.0	75	3.4
R03	Yes	Give example of consequences of introducing new species.	28	2.4	27	3.3	28	3.0
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	8	1.1	7	1.5	9	1.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	65	2.2	64	3.1	66	2.5
X02B	Yes	Explain why light is important in aquarium ecosystem.	40	2.2	40	3.2	39	2.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Hungary SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	69	1.1	68	1.4	71	1.4
A10	No	Relate light level and reflectance to vision of object.	66	0.9	68	1.2	64	1.5
B02	No	Know type of energy released from combustion engine.	65	1.3	69	1.9	62	1.9
B03	No	Determine density from mass/volume table.	37	1.5	41	1.9	32	2.0
B06	No	Relate color of object to amount of light reflection.	94	0.7	92	1.2	95	0.7
C09	No	Identify correct position of reflected image.	83	1.2	84	1.7	83	1.7
C12	No	Identify substance which is NOT a fossil fuel.	17	1.2	18	1.5	17	1.6
D01	No	Identify correct diagram of light rays through lens.	48	1.8	60	2.3	36	2.2
D02	No	Identify substance from magnetic properties.	94	0.8	95	1.1	92	1.2
D04	No	Relate physical event to its sequence of energy changes.	72	1.6	79	1.8	64	2.3
E07	No	Identify particles found in the nucleus of atoms.	48	1.8	49	2.3	47	2.2
E11	No	Find shadow size from diagram of bulb/card/screen distances.	63	1.3	64	2.2	62	2.0
F02	No	Relate color and light reflection to temperature of object.	85	1.3	88	1.7	83	1.8
G07	No	Identify correct way to place batteries in a flashlight.	89	1.2	91	1.7	86	1.6
H05	No	Identify source of energy stored in food.	14	1.3	14	1.8	13	1.7
I16	Yes	Identify material with greatest heat conductivity.	89	1.5	92	2.3	87	2.4
J05	Yes	Identify type of solar radiation that causes sunburn.	72	2.7	77	3.2	67	3.8
K10	Yes	Describe a method demonstrating the existence of air.	8	1.9	12	3.4	5	1.4
K13	Yes	Identify electrical conductors that form complete circuits.	85	2.0	91	2.1	80	3.2
K14	Yes	Relate evaporation rate to surface area.	86	1.5	90	2.1	80	2.6
K17	Yes	Relate presence of gravitational force to position of falling object.	72	2.3	78	3.1	66	3.1
L01	Yes	Select diagram showing forces resulting in rotation.	54	2.8	62	3.5	47	4.0
L04	Yes	Explain most efficient engine.	36	3.0	35	4.0	37	4.0
L07	Yes	Relate sound transmission to air.	82	2.2	82	3.1	82	2.8
M12	Yes	Complete table of voltage/current data for circuit.	66	2.6	73	3.1	58	3.9
M14	Yes	Draw reflected image of object.	85	2.0	85	3.3	86	2.9
N08	Yes	Relate lever arm lengths to balanced weights.	68	2.8	72	3.6	63	3.6
N10	Yes	Determine effect of tipping container on water surface.	62	2.9	72	3.6	51	4.4
O10	Yes	Identify polarity of ends of cut magnet.	53	3.1	61	4.2	44	4.3
O13	Yes	Relate circular motion to centripetal force.	76	2.6	80	3.2	71	3.5
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	83	1.9	81	2.8	85	2.7
P02	Yes	Explain relationship between illuminance and distance of light source.	40	2.7	42	3.6	39	3.5
P05	Yes	Explain why balloon expands upon heating.	57	3.2	65	4.2	51	4.2
Q12	Yes	Explain how focusing affects the amount of light.	61	2.6	68	3.3	56	3.7
Q13	Yes	Compare heat expansion properties of metal and glass.	78	2.1	76	3.4	80	3.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	38	2.6	43	3.9	33	3.5
R01	Yes	Choose diagram showing angle of reflected light.	70	2.5	72	3.8	68	3.6
R02	Yes	Identify reflection/absorption properties from color.	45	2.7	46	4.0	44	3.2
Y01	Yes	Explain amount of light/electric energy in a lamp.	9	1.2	11	1.6	7	1.7
Y02	Yes	Explain temperature of melting snowball.	11	1.1	12	1.5	10	1.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Iceland SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	79	1.2	82	1.8	76	1.7
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	68	2.0	66	2.3	70	3.2
F06	No	Relate rusting iron to the presence of oxygen and moisture.	78	2.7	77	3.0	78	3.6
G10	No	Select correct statement regarding the atomic makeup of matter.	41	3.2	46	4.2	35	3.9
H06	No	Know if wood-burning reaction absorbs or releases energy.	50	3.3	53	4.6	46	4.8
J03	Yes	Know relationship between molecules, atoms and cells.	12	2.8	11	2.9	13	4.0
J04	Yes	Distiguish between a chemical reaction and a physical change.	25	4.6	30	6.3	20	4.6
J06	Yes	Know what happens to atoms in animal after death.	29	4.0	25	5.1	33	6.9
J08	Yes	Identify gas involved in fire ignition.	31	3.6	28	5.4	35	5.3
M10	Yes	Identify substances which are mixtures.	40	4.4	39	6.0	41	5.4
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	22	3.2	25	5.7	20	4.1
N07	Yes	Explain oxygen fuel requirements of burning candle.	91	2.6	92	3.4	90	3.9
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	41	3.2	31	4.3	53	4.9
O11	Yes	Identify which change in elemental form is due to a chemical change.	22	3.9	23	5.5	20	5.8
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	9	2.5	13	4.1	4	2.0
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	38	3.0	36	4.2	40	5.3
Q15	Yes	Determine physical processes involving chemical change.	20	2.9	23	4.6	16	4.0
R05	Yes	Explain how carbon dioxide fire extinguishers work.	57	4.5	61	6.0	54	6.5
Z01A	Yes	Explain why steel bridges must be painted.	67	3.6	70	4.9	63	5.0
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	44	3.7	53	7.3	34	5.8
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	26	3.5	30	5.7	20	4.2

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Iceland SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	60	1.5	63	1.8	58	2.2
B01	No	Identify hottest layer of the Earth.	89	1.8	90	2.9	88	1.8
B05	No	Use elevation/weather diagram to locate earth feature.	58	1.8	58	2.7	58	3.0
C07	No	Relate mountain shape to age.	16	1.9	22	3.2	9	1.8
D03	No	Identify direction of river flow on contour map.	36	2.5	43	4.4	29	2.9
E09	No	Use table of time/temperature to determine point when weather changes.	72	2.2	73	3.1	71	4.0
E12	No	Identify type of stone involved in cave formation.	26	2.5	27	2.7	25	3.5
F05	No	Relate level of oxygen to elevation.	81	2.1	85	1.9	77	3.0
G11	No	Identify type of rock from description of its formation.	45	3.5	48	4.8	42	4.4
H03	No	Select explanation for moonlight.	79	2.1	83	2.4	75	3.3
H04	No	Identify ground layer containing the most organic material.	65	2.4	69	2.4	60	5.0
I17	Yes	Know energy source for Earth’s water cycle.	27	2.6	28	3.9	26	3.5
J01	Yes	Know changes in Earth’s surface over billions of years.	35	4.5	30	6.0	39	5.1
K15	Yes	Know organic origins of fossil fuels.	46	6.4	38	8.4	54	6.5
O12	Yes	Know relative amounts of components in air.	14	2.3	17	3.8	9	2.8
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	71	3.8	76	3.8	65	5.7
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	91	2.3	84	4.6	98	1.3
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	21	2.9	25	4.5	16	3.5
Q16	Yes	Estimate time for light from star to reach Earth.	21	4.6	19	4.7	24	6.7
R04	Yes	Give reason why ozone layer is important for life.	56	4.2	63	7.2	49	5.7
W01A	Yes	Give reason region in land/water diagram is a good farming location.	81	2.2	85	2.8	76	3.2
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	26	2.9	28	3.9	25	3.5
W02	Yes	Draw diagram showing Earth’s water cycle.	33	3.3	36	5.3	29	5.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Iceland SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	70	2.1	73	3.2	67	2.0
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	30	2.2	36	2.9	24	2.7
F04	No	Predict type of area where soil erosion by rain is most likely.	42	2.8	49	4.7	35	2.9
G12	No	Identify a nonrenewable natural resource.	62	2.2	66	2.7	58	3.3
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	28	4.5	32	7.8	23	4.8
I13	Yes	Select best scale for accurate measurement.	57	3.8	55	6.9	59	6.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	45	3.4	37	4.9	53	5.5
I18	Yes	Write conclusion from summary of experimental observations.	23	3.5	25	5.6	22	4.6
K19	Yes	Write an example of how computers are used to do work.	80	3.2	79	4.9	81	5.2
N01	Yes	Determine correct control experiment to test hypothesis.	47	4.1	47	8.8	47	6.8
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	56	2.8	60	3.9	52	5.0
N05	Yes	Identify a principal cause of acid rain.	35	4.5	37	5.8	33	7.2
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	59	3.5	52	4.9	67	4.9
Z02A	Yes	Write a reason why not all people have enough water.	59	3.8	57	5.1	63	5.5
Z02B	Yes	Write a second reason why not all people have enough water.	39	3.7	36	5.8	44	3.9

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Iceland SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	55	1.3	50	1.9	60	1.6
B04	No	Predict pulse/breathing rate change after exercise.	93	1.2	92	2.0	94	1.3
C08	No	Identify carrier of signals from eye to brain.	83	1.5	86	1.8	80	2.6
D05	No	Identify system carrying sensory messages to the brain.	64	2.2	75	3.3	53	3.3
D06	No	Relate plant part to seed development.	72	2.6	73	3.8	71	2.9
E08	No	Select correct statement of trait heredity from parents.	92	1.1	90	2.3	93	1.5
E10	No	Determine characteristics for classifying animals.	62	2.3	60	2.6	65	2.8
F01	No	Identify characteristic of mammal.	72	2.5	70	3.7	74	3.2
F03	No	Identify human organ which interprets senses.	47	2.9	55	3.6	39	3.8
G08	No	Identify main function of red blood cells.	63	2.2	64	3.2	62	3.4
G09	No	Identify reproductive cells involved in heredity.	76	1.7	74	3.0	80	2.0
H01	No	Identify the functions of blood.	80	2.8	82	2.6	77	3.8
H02	No	Identify the role of vitamins.	77	1.7	76	1.8	78	3.7
I10	Yes	Identify nutrition content of fruits and vegetables.	90	2.9	90	4.3	90	3.4
I11	Yes	Know identifying features of insects.	31	3.4	37	6.2	26	4.1
I14	Yes	Relate elbow action to a simple machine.	39	3.3	43	4.8	35	3.5
I19	Yes	Identify statement of oxygen production consistent with data.	43	4.1	40	5.5	45	6.3
J02	Yes	Choose species on Earth for shortest time.	81	3.7	82	4.5	80	5.5
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	58	5.1	56	5.9	59	6.7
J09	Yes	Explain how to determine the age of a cut tree.	90	2.4	86	4.3	94	1.9
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	47	5.0	39	6.8	56	6.0
K12	Yes	Relate reproductive cell production to population.	26	2.9	29	5.0	24	4.7
K16	Yes	Identify common product made with bacteria.	59	4.0	54	5.3	64	5.0
K18	Yes	Identify main function of chloroplasts in plant cell.	63	3.2	62	6.3	64	5.6
L02	Yes	Select reason why algae are close to ocean surface.	51	3.5	56	5.9	46	5.2
L03	Yes	Identify skull features typical of predators.	73	4.2	80	4.7	65	5.4
L05	Yes	Select most likely purpose for birds' singing.	79	4.9	83	6.8	76	4.5
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	45	4.4	46	6.9	43	6.0
M11	Yes	Complete a food web showing energy relationships.	53	6.1	54	8.4	51	5.2
N02	Yes	Choose meal which would give the most nutrients.	53	4.8	49	7.0	59	4.4
N04	Yes	Identify how decaying fish fertilize plants.	44	3.4	47	4.4	39	4.2
N06	Yes	Identify the most basic unit of living things.	65	4.0	60	5.6	71	4.9
O16	Yes	Give reason for thirst on a hot day.	59	5.0	69	6.6	46	5.7
O17	Yes	Describe how disease may be transmitted.	85	2.9	80	4.8	91	2.0
P04	Yes	Identify what happens to animals' biological processes during hibernation.	47	4.6	49	6.5	45	5.2
P06	Yes	Describe digestion occuring in the mouth.	36	3.9	35	6.0	37	7.4
R03	Yes	Give example of consequences of introducing new species.	4	1.3	4	1.9	4	1.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	8	1.5	8	2.0	8	1.9
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	61	3.9	60	4.2	61	5.1
X02B	Yes	Explain why light is important in aquarium ecosystem.	17	2.2	21	2.0	14	3.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Iceland SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	56	1.6	58	1.6	54	2.6
A10	No	Relate light level and reflectance to vision of object.	77	1.6	77	2.8	76	1.8
B02	No	Know type of energy released from combustion engine.	44	2.6	49	3.4	39	2.8
B03	No	Determine density from mass/volume table.	50	2.4	51	3.8	50	3.2
B06	No	Relate color of object to amount of light reflection.	84	1.8	84	1.9	83	2.7
C09	No	Identify correct position of reflected image.	81	3.0	84	3.1	77	3.7
C12	No	Identify substance which is NOT a fossil fuel.	59	2.4	64	3.1	55	4.1
D01	No	Identify correct diagram of light rays through lens.	39	2.5	51	2.6	26	3.2
D02	No	Identify substance from magnetic properties.	50	2.2	56	2.6	43	3.5
D04	No	Relate physical event to its sequence of energy changes.	53	2.8	52	4.5	53	4.5
E07	No	Identify particles found in the nucleus of atoms.	28	2.6	29	3.5	27	2.8
E11	No	Find shadow size from diagram of bulb/card/screen distances.	47	2.4	44	3.6	51	2.9
F02	No	Relate color and light reflection to temperature of object.	67	2.4	72	2.8	62	3.6
G07	No	Identify correct way to place batteries in a flashlight.	86	1.4	84	2.3	89	1.8
H05	No	Identify source of energy stored in food.	14	1.5	15	2.4	13	2.5
I16	Yes	Identify material with greatest heat conductivity.	89	2.3	88	4.3	91	3.4
J05	Yes	Identify type of solar radiation that causes sunburn.	72	3.1	69	4.5	75	4.8
K10	Yes	Describe a method demonstrating the existence of air.	21	3.5	16	3.2	27	5.3
K13	Yes	Identify electrical conductors that form complete circuits.	66	4.2	68	8.9	64	4.5
K14	Yes	Relate evaporation rate to surface area.	70	5.4	65	5.8	75	5.6
K17	Yes	Relate presence of gravitational force to position of falling object.	40	5.0	43	7.4	37	6.2
L01	Yes	Select diagram showing forces resulting in rotation.	38	3.6	43	6.4	34	4.2
L04	Yes	Explain most efficient engine.	33	4.4	30	5.6	36	5.3
L07	Yes	Relate sound transmission to air.	65	4.8	65	7.0	65	5.9
M12	Yes	Complete table of voltage/current data for circuit.	41	4.7	49	6.3	33	5.2
M14	Yes	Draw reflected image of object.	73	5.0	74	8.1	73	5.7
N08	Yes	Relate lever arm lengths to balanced weights.	74	4.2	81	4.0	65	8.6
N10	Yes	Determine effect of tipping container on water surface.	56	3.6	61	5.2	50	3.7
O10	Yes	Identify polarity of ends of cut magnet.	50	4.0	59	5.9	39	4.6
O13	Yes	Relate circular motion to centripetal force.	60	3.8	66	7.1	53	5.2
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	86	3.1	83	5.1	88	2.7
P02	Yes	Explain relationship between illuminance and distance of light source.	14	2.6	12	3.7	16	5.2
P05	Yes	Explain why balloon expands upon heating.	58	4.6	62	6.2	53	7.4
Q12	Yes	Explain how focusing affects the amount of light.	61	4.3	56	6.4	66	5.0
Q13	Yes	Compare heat expansion properties of metal and glass.	72	3.7	75	3.6	69	5.4
Q18	Yes	Explain effect of melting on the mass of ice cubes.	31	3.3	26	4.3	36	4.7
R01	Yes	Choose diagram showing angle of reflected light.	60	4.5	53	4.4	67	6.7
R02	Yes	Identify reflection/absorption properties from color.	43	4.7	38	6.1	47	7.7
Y01	Yes	Explain amount of light/electric energy in a lamp.	3	1.3	5	2.3	2	0.6
Y02	Yes	Explain temperature of melting snowball.	15	2.8	19	4.5	11	2.1

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Iran, Islamic Rep. SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	90	0.9	92	0.8	86	1.4
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	54	1.8	55	2.3	53	2.7
F06	No	Relate rusting iron to the presence of oxygen and moisture.	76	1.8	76	2.3	76	2.9
G10	No	Select correct statement regarding the atomic makeup of matter.	47	1.6	52	2.2	42	3.1
H06	No	Know if wood-burning reaction absorbs or releases energy.	64	2.1	67	3.2	62	2.8
J03	Yes	Know relationship between molecules, atoms and cells.	23	2.4	22	3.0	23	3.9
J04	Yes	Distiguish between a chemical reaction and a physical change.	64	3.3	63	4.6	67	4.9
J06	Yes	Know what happens to atoms in animal after death.	31	3.3	33	4.7	26	4.5
J08	Yes	Identify gas involved in fire ignition.	26	2.7	28	3.5	23	4.0
M10	Yes	Identify substances which are mixtures.	32	3.5	34	4.8	29	5.0
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	65	2.9	71	4.2	56	3.6
N07	Yes	Explain oxygen fuel requirements of burning candle.	94	1.2	95	1.8	93	2.2
O11	Yes	Identify which change in elemental form is due to a chemical change.	56	2.8	57	4.1	56	3.9
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	40	3.8	35	5.3	47	4.9
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	56	3.1	52	3.9	61	4.8
Q15	Yes	Determine physical processes involving chemical change.	52	2.5	45	3.4	62	4.0
R05	Yes	Explain how carbon dioxide fire extinguishers work.	63	2.7	73	3.4	49	4.2
Z01A	Yes	Explain why steel bridges must be painted.	66	3.3	74	3.7	55	4.8
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	35	2.6	34	3.6	37	4.5
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	9	2.1	10	3.1	8	2.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Iran, Islamic Rep. SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	47	1.3	54	1.1	38	2.1
B01	No	Identify hottest layer of the Earth.	73	1.3	77	1.8	67	2.4
B05	No	Use elevation/weather diagram to locate earth feature.	31	1.4	31	2.2	30	1.7
C07	No	Relate mountain shape to age.	54	1.7	60	2.0	47	3.0
D03	No	Identify direction of river flow on contour map.	22	1.4	23	2.5	21	1.6
E09	No	Use table of time/temperature to determine point when weather changes.	52	2.3	53	2.7	49	3.8
E12	No	Identify type of stone involved in cave formation.	56	2.1	56	3.1	55	2.6
F05	No	Relate level of oxygen to elevation.	80	2.0	80	3.0	79	2.7
G11	No	Identify type of rock from description of its formation.	84	1.6	85	2.1	82	2.1
H03	No	Select explanation for moonlight.	88	1.2	89	1.7	86	1.8
H04	No	Identify ground layer containing the most organic material.	46	2.0	50	3.0	41	2.9
I17	Yes	Know energy source for Earth’s water cycle.	35	3.1	38	3.6	31	4.8
J01	Yes	Know changes in Earth’s surface over billions of years.	15	2.0	18	3.3	13	2.5
K15	Yes	Know organic origins of fossil fuels.	75	2.8	75	4.4	75	3.7
O12	Yes	Know relative amounts of components in air.	4	1.3	7	2.1	1	0.7
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	34	2.5	41	3.6	24	3.2
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	66	3.0	67	3.9	66	4.3
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	31	3.8	33	5.8	29	5.0
Q16	Yes	Estimate time for light from star to reach Earth.	17	2.2	17	3.3	17	3.1
R04	Yes	Give reason why ozone layer is important for life.	19	3.0	29	4.3	8	2.2
W01A	Yes	Give reason region in land/water diagram is a good farming location.	82	1.6	79	2.2	86	2.3
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	25	2.0	28	3.0	22	2.7
W02	Yes	Draw diagram showing Earth’s water cycle.	11	1.4	12	1.9	10	2.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Iran, Islamic Rep. SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	70	1.3	73	1.7	67	2.0
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	26	1.3	29	1.9	22	1.8
G12	No	Identify a nonrenewable natural resource.	40	1.3	44	2.0	36	1.8
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	19	2.5	17	3.7	20	3.3
I13	Yes	Select best scale for accurate measurement.	33	2.4	35	3.2	32	4.3
I15	Yes	Identify the type of scientific statement given in an experimental report.	18	2.2	18	2.8	19	3.4
I18	Yes	Write conclusion from summary of experimental observations.	31	3.1	28	3.8	34	5.1
K19	Yes	Write an example of how computers are used to do work.	51	4.5	56	6.9	45	6.2
N01	Yes	Determine correct control experiment to test hypothesis.	31	3.5	30	5.1	32	4.8
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	67	2.7	72	3.3	59	3.9
N05	Yes	Identify a principal cause of acid rain.	23	2.7	23	3.4	24	4.8
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	39	3.0	37	4.3	41	4.5
Z02A	Yes	Write a reason why not all people have enough water.	61	4.4	64	5.9	56	6.2
Z02B	Yes	Write a second reason why not all people have enough water.	17	3.5	18	4.9	14	3.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Iran, Islamic Rep. SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	57	1.6	51	2.1	65	2.5
B04	No	Predict pulse/breathing rate change after exercise.	81	1.6	83	2.3	79	1.8
C08	No	Identify carrier of signals from eye to brain.	84	1.3	84	1.9	84	1.9
D05	No	Identify system carrying sensory messages to the brain.	74	2.4	75	4.1	72	2.9
D06	No	Relate plant part to seed development.	78	1.9	83	1.8	71	3.2
E08	No	Select correct statement of trait heredity from parents.	60	2.3	57	2.3	64	3.6
E10	No	Determine characteristics for classifying animals.	30	1.6	31	1.9	28	2.8
F01	No	Identify characteristic of mammal.	83	1.4	81	2.0	84	2.3
F03	No	Identify human organ which interprets senses.	54	1.7	57	2.3	49	2.2
G08	No	Identify main function of red blood cells.	28	2.4	30	4.0	27	2.5
G09	No	Identify reproductive cells involved in heredity.	41	2.3	43	4.0	39	1.9
H01	No	Identify the functions of blood.	56	2.5	58	3.6	54	3.1
H02	No	Identify the role of vitamins.	77	1.5	76	1.5	78	2.3
I10	Yes	Identify nutrition content of fruits and vegetables.	59	2.6	55	3.6	64	3.5
I11	Yes	Know identifying features of insects.	28	3.0	28	4.2	27	4.2
I14	Yes	Relate elbow action to a simple machine.	46	3.5	48	5.8	43	3.7
I19	Yes	Identify statement of oxygen production consistent with data.	29	2.6	30	3.7	28	3.2
J02	Yes	Choose species on Earth for shortest time.	32	2.5	37	3.7	26	3.2
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	44	3.1	38	4.5	52	4.1
J09	Yes	Explain how to determine the age of a cut tree.	81	3.1	83	4.9	80	3.5
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	51	3.7	49	4.8	53	6.2
K12	Yes	Relate reproductive cell production to population.	32	3.1	33	4.7	32	4.0
K16	Yes	Identify common product made with bacteria.	40	3.5	43	4.1	37	5.6
K18	Yes	Identify main function of chloroplasts in plant cell.	38	3.5	39	5.5	37	4.1
L02	Yes	Select reason why algae are close to ocean surface.	39	2.8	42	4.4	36	4.0
L03	Yes	Identify skull features typical of predators.	54	4.4	66	6.4	41	3.8
L05	Yes	Select most likely purpose for birds' singing.	60	3.1	60	4.4	59	4.4
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	55	3.7	58	3.4	50	6.3
M11	Yes	Complete a food web showing energy relationships.	68	3.1	70	4.6	67	4.5
N02	Yes	Choose meal which would give the most nutrients.	29	3.1	24	3.9	34	4.4
N04	Yes	Identify how decaying fish fertilize plants.	47	2.9	51	4.1	42	3.4
N06	Yes	Identify the most basic unit of living things.	70	2.2	72	3.2	69	3.9
O16	Yes	Give reason for thirst on a hot day.	51	3.2	59	4.6	40	4.4
O17	Yes	Describe how disease may be transmitted.	61	4.2	55	7.1	68	4.6
P04	Yes	Identify what happens to animals' biological processes during hibernation.	49	3.2	54	3.8	42	5.1
P06	Yes	Describe digestion occuring in the mouth.	23	2.3	23	3.5	23	3.1
Q17	Yes	Describe the advantage of having two eyes.	27	2.3	34	3.1	17	3.1
R03	Yes	Give example of consequences of introducing new species.	3	1.1	5	1.9	2	0.8
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	4	1.1	5	1.5	3	1.5
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	44	2.6	44	3.9	43	3.3
X02B	Yes	Explain why light is important in aquarium ecosystem.	32	2.7	28	3.9	36	3.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Iran, Islamic Rep. SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	50	1.6	52	2.6	47	1.8
A10	No	Relate light level and reflectance to vision of object.	72	1.5	75	2.1	69	2.3
B02	No	Know type of energy released from combustion engine.	63	2.3	60	3.3	66	2.4
B03	No	Determine density from mass/volume table.	17	1.1	17	1.1	17	1.9
B06	No	Relate color of object to amount of light reflection.	87	1.2	85	1.6	89	1.6
C09	No	Identify correct position of reflected image.	67	2.4	73	3.1	60	3.6
C12	No	Identify substance which is NOT a fossil fuel.	41	1.9	46	2.7	35	2.8
D01	No	Identify correct diagram of light rays through lens.	44	2.7	54	3.9	33	3.1
D02	No	Identify substance from magnetic properties.	56	1.9	59	2.6	53	2.4
D04	No	Relate physical event to its sequence of energy changes.	66	1.7	65	2.6	67	2.6
E07	No	Identify particles found in the nucleus of atoms.	32	2.3	35	3.7	29	1.7
E11	No	Find shadow size from diagram of bulb/card/screen distances.	57	2.0	58	2.8	54	2.7
F02	No	Relate color and light reflection to temperature of object.	63	1.8	66	2.5	59	2.8
G07	No	Identify correct way to place batteries in a flashlight.	67	2.4	74	3.9	57	2.4
H05	No	Identify source of energy stored in food.	54	1.7	56	2.0	51	2.8
I16	Yes	Identify material with greatest heat conductivity.	73	2.5	70	3.7	76	4.0
J05	Yes	Identify type of solar radiation that causes sunburn.	23	3.6	23	4.8	22	4.7
K10	Yes	Describe a method demonstrating the existence of air.	25	2.9	27	3.3	23	4.8
K13	Yes	Identify electrical conductors that form complete circuits.	59	3.0	69	5.0	48	3.3
K14	Yes	Relate evaporation rate to surface area.	76	3.1	75	4.5	78	3.8
K17	Yes	Relate presence of gravitational force to position of falling object.	51	3.6	55	5.0	47	4.6
L01	Yes	Select diagram showing forces resulting in rotation.	38	2.6	40	3.7	37	5.0
L04	Yes	Explain most efficient engine.	25	3.4	24	5.6	26	4.0
L07	Yes	Relate sound transmission to air.	65	4.1	70	6.2	58	5.0
M12	Yes	Complete table of voltage/current data for circuit.	38	2.3	44	3.7	31	3.8
M14	Yes	Draw reflected image of object.	57	4.2	60	5.1	53	5.6
N08	Yes	Relate lever arm lengths to balanced weights.	48	3.0	60	2.9	32	4.0
N10	Yes	Determine effect of tipping container on water surface.	27	5.7	36	8.9	16	3.5
O10	Yes	Identify polarity of ends of cut magnet.	48	4.3	47	6.5	50	5.2
O13	Yes	Relate circular motion to centripetal force.	45	4.0	49	4.7	39	6.1
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	65	3.4	68	4.0	61	5.2
P02	Yes	Explain relationship between illuminance and distance of light source.	37	2.8	43	3.5	28	4.1
P05	Yes	Explain why balloon expands upon heating.	68	3.3	74	3.4	61	4.9
Q12	Yes	Explain how focusing affects the amount of light.	61	2.9	63	3.5	58	5.4
Q13	Yes	Compare heat expansion properties of metal and glass.	34	3.4	37	4.3	30	4.4
Q18	Yes	Explain effect of melting on the mass of ice cubes.	29	2.9	35	3.6	22	3.8
R01	Yes	Choose diagram showing angle of reflected light.	75	3.0	73	4.7	79	3.1
R02	Yes	Identify reflection/absorption properties from color.	24	2.4	22	3.2	27	4.9
Y01	Yes	Explain amount of light/electric energy in a lamp.	13	1.6	16	3.0	10	1.6
Y02	Yes	Explain temperature of melting snowball.	3	0.9	4	1.7	1	0.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Ireland SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	85	1.0	87	1.3	83	1.5
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	80	1.3	82	1.8	78	2.0
F06	No	Relate rusting iron to the presence of oxygen and moisture.	62	1.6	66	2.3	58	2.1
G10	No	Select correct statement regarding the atomic makeup of matter.	57	2.3	64	2.8	50	3.2
H06	No	Know if wood-burning reaction absorbs or releases energy.	64	2.0	69	3.2	59	2.4
J03	Yes	Know relationship between molecules, atoms and cells.	25	2.4	27	3.7	23	3.1
J04	Yes	Distiguish between a chemical reaction and a physical change.	43	3.2	45	4.0	41	4.5
J06	Yes	Know what happens to atoms in animal after death.	21	2.2	23	3.2	19	2.7
J08	Yes	Identify gas involved in fire ignition.	42	2.9	45	4.2	38	4.0
M10	Yes	Identify substances which are mixtures.	41	3.0	37	4.0	46	4.6
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	61	2.7	66	3.6	55	3.9
N07	Yes	Explain oxygen fuel requirements of burning candle.	93	1.5	95	1.9	92	2.2
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	64	2.7	62	3.9	66	3.3
O11	Yes	Identify which change in elemental form is due to a chemical change.	26	2.3	33	3.4	19	2.7
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	46	2.9	46	4.7	47	3.8
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	56	2.4	52	3.8	60	3.1
Q15	Yes	Determine physical processes involving chemical change.	39	2.9	36	3.6	42	4.2
R05	Yes	Explain how carbon dioxide fire extinguishers work.	66	3.2	70	4.2	62	4.5
Z01A	Yes	Explain why steel bridges must be painted.	81	1.9	84	2.8	78	2.9
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	46	2.5	48	4.0	44	3.6
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	38	2.5	37	3.8	40	3.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Ireland SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	67	1.5	70	2.0	64	2.0
B01	No	Identify hottest layer of the Earth.	94	0.7	95	0.9	93	1.1
B05	No	Use elevation/weather diagram to locate earth feature.	50	1.8	51	2.8	50	1.9
C07	No	Relate mountain shape to age.	40	1.7	41	2.5	39	2.4
D03	No	Identify direction of river flow on contour map.	41	1.9	50	2.3	32	2.6
E09	No	Use table of time/temperature to determine point when weather changes.	80	1.4	80	2.0	80	1.6
E12	No	Identify type of stone involved in cave formation.	68	2.0	69	2.8	66	2.7
F05	No	Relate level of oxygen to elevation.	90	1.1	90	1.3	90	1.6
G11	No	Identify type of rock from description of its formation.	60	1.9	58	2.5	62	2.6
H03	No	Select explanation for moonlight.	77	1.4	83	2.0	71	1.9
H04	No	Identify ground layer containing the most organic material.	52	1.5	57	2.2	46	2.2
I17	Yes	Know energy source for Earth’s water cycle.	43	2.8	46	3.7	39	4.2
J01	Yes	Know changes in Earth’s surface over billions of years.	43	3.1	44	4.2	41	3.6
K15	Yes	Know organic origins of fossil fuels.	87	2.3	89	3.1	85	3.1
O12	Yes	Know relative amounts of components in air.	30	3.0	30	4.5	30	3.9
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	63	2.7	69	3.5	57	3.8
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	90	1.8	87	2.8	94	2.0
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	34	2.4	41	3.6	28	3.6
Q16	Yes	Estimate time for light from star to reach Earth.	29	2.4	31	3.2	26	3.5
R04	Yes	Give reason why ozone layer is important for life.	53	3.1	55	4.1	50	4.8
W01A	Yes	Give reason region in land/water diagram is a good farming location.	91	1.2	90	1.6	92	1.4
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	71	1.8	73	2.7	69	2.3
W02	Yes	Draw diagram showing Earth’s water cycle.	51	2.2	55	3.2	46	2.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Ireland SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	77	1.2	78	1.9	75	1.4
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	55	1.8	64	2.5	47	2.5
F04	No	Predict type of area where soil erosion by rain is most likely.	76	1.5	77	2.3	75	2.1
G12	No	Identify a nonrenewable natural resource.	77	1.7	78	2.2	76	2.2
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	33	2.7	30	3.2	35	3.9
I13	Yes	Select best scale for accurate measurement.	54	2.9	59	4.0	48	4.2
I15	Yes	Identify the type of scientific statement given in an experimental report.	45	2.3	43	3.6	47	3.3
I18	Yes	Write conclusion from summary of experimental observations.	41	2.6	40	3.7	42	3.9
K19	Yes	Write an example of how computers are used to do work.	90	1.8	89	2.5	91	2.3
N01	Yes	Determine correct control experiment to test hypothesis.	36	2.4	40	3.5	33	3.2
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	74	2.3	74	3.3	74	3.2
N05	Yes	Identify a principal cause of acid rain.	43	2.6	43	4.1	44	3.5
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	54	2.7	54	3.5	55	3.8
Z02A	Yes	Write a reason why not all people have enough water.	82	2.0	76	3.4	87	2.2
Z02B	Yes	Write a second reason why not all people have enough water.	64	2.8	54	3.9	73	2.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Ireland SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	71	1.4	66	2.0	77	1.6
B04	No	Predict pulse/breathing rate change after exercise.	94	0.8	93	1.2	95	0.9
C08	No	Identify carrier of signals from eye to brain.	72	1.8	72	2.5	72	2.4
D05	No	Identify system carrying sensory messages to the brain.	74	1.9	73	2.7	75	2.1
D06	No	Relate plant part to seed development.	54	2.0	57	2.8	51	2.4
E08	No	Select correct statement of trait heredity from parents.	85	1.4	82	2.2	87	1.6
E10	No	Determine characteristics for classifying animals.	54	2.2	53	2.8	56	3.0
F01	No	Identify characteristic of mammal.	46	2.1	46	2.7	45	2.7
F03	No	Identify human organ which interprets senses.	74	1.5	76	1.8	72	2.4
G08	No	Identify main function of red blood cells.	71	1.7	73	2.4	70	2.1
G09	No	Identify reproductive cells involved in heredity.	80	1.5	77	2.4	83	1.6
H01	No	Identify the functions of blood.	75	1.4	74	2.1	76	1.9
H02	No	Identify the role of vitamins.	87	1.1	81	1.9	93	0.9
I10	Yes	Identify nutrition content of fruits and vegetables.	65	2.3	63	3.2	68	3.5
I11	Yes	Know identifying features of insects.	35	2.7	39	3.9	30	3.2
I14	Yes	Relate elbow action to a simple machine.	67	2.7	63	3.7	71	4.1
I19	Yes	Identify statement of oxygen production consistent with data.	55	3.0	54	4.2	55	4.1
J02	Yes	Choose species on Earth for shortest time.	77	2.4	82	3.0	71	3.7
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	43	2.7	44	3.4	41	4.0
J09	Yes	Explain how to determine the age of a cut tree.	89	1.8	88	2.4	91	2.2
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	63	2.8	61	3.7	64	4.1
K12	Yes	Relate reproductive cell production to population.	69	3.0	68	3.8	69	4.0
K16	Yes	Identify common product made with bacteria.	41	3.1	36	3.6	46	4.4
K18	Yes	Identify main function of chloroplasts in plant cell.	47	2.6	42	3.4	51	4.1
L02	Yes	Select reason why algae are close to ocean surface.	47	2.8	61	3.8	35	3.8
L03	Yes	Identify skull features typical of predators.	67	2.5	68	3.4	66	3.7
L05	Yes	Select most likely purpose for birds' singing.	67	2.6	70	3.3	64	3.7
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	60	2.8	62	4.1	58	4.0
M11	Yes	Complete a food web showing energy relationships.	83	2.4	85	3.2	81	3.1
N02	Yes	Choose meal which would give the most nutrients.	37	2.8	30	3.3	44	3.9
N04	Yes	Identify how decaying fish fertilize plants.	50	2.7	49	3.2	51	4.0
N06	Yes	Identify the most basic unit of living things.	54	3.0	58	4.5	52	3.6
O16	Yes	Give reason for thirst on a hot day.	51	2.9	55	3.6	47	3.9
O17	Yes	Describe how disease may be transmitted.	59	2.4	55	3.4	64	3.6
P04	Yes	Identify what happens to animals' biological processes during hibernation.	58	2.8	58	4.2	57	3.3
P06	Yes	Describe digestion occuring in the mouth.	58	2.9	54	3.9	61	3.4
Q17	Yes	Describe the advantage of having two eyes.	82	2.4	80	3.0	83	3.5
R03	Yes	Give example of consequences of introducing new species.	12	1.9	16	3.2	7	2.0
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	16	1.5	15	2.2	18	2.1
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	60	2.3	60	2.9	59	3.3
X02B	Yes	Explain why light is important in aquarium ecosystem.	22	2.0	25	2.5	19	3.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Ireland SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	69	1.3	71	1.8	68	1.6
A10	No	Relate light level and reflectance to vision of object.	74	1.0	75	1.5	73	1.2
B02	No	Know type of energy released from combustion engine.	57	1.6	57	2.2	58	2.3
B03	No	Determine density from mass/volume table.	24	1.3	26	1.8	23	1.7
B06	No	Relate color of object to amount of light reflection.	82	1.2	85	1.7	80	1.9
C09	No	Identify correct position of reflected image.	68	1.7	73	2.2	64	2.7
C12	No	Identify substance which is NOT a fossil fuel.	63	1.6	66	2.6	60	2.3
D01	No	Identify correct diagram of light rays through lens.	27	1.5	34	2.2	20	1.9
D02	No	Identify substance from magnetic properties.	81	1.4	83	1.9	78	1.9
D04	No	Relate physical event to its sequence of energy changes.	68	1.5	69	2.0	67	2.1
E07	No	Identify particles found in the nucleus of atoms.	48	2.1	47	2.7	50	2.8
E11	No	Find shadow size from diagram of bulb/card/screen distances.	62	1.5	63	2.3	60	2.2
F02	No	Relate color and light reflection to temperature of object.	58	2.0	64	2.7	53	2.6
G07	No	Identify correct way to place batteries in a flashlight.	86	1.2	88	1.6	83	1.5
H05	No	Identify source of energy stored in food.	35	1.9	33	2.3	37	2.9
I16	Yes	Identify material with greatest heat conductivity.	87	1.7	87	2.5	87	2.5
J05	Yes	Identify type of solar radiation that causes sunburn.	82	2.1	83	2.5	81	2.8
K10	Yes	Describe a method demonstrating the existence of air.	36	2.4	35	3.5	37	3.5
K13	Yes	Identify electrical conductors that form complete circuits.	69	2.6	81	3.0	58	4.0
K14	Yes	Relate evaporation rate to surface area.	83	2.1	85	2.6	81	3.3
K17	Yes	Relate presence of gravitational force to position of falling object.	55	2.7	60	3.6	49	4.0
L01	Yes	Select diagram showing forces resulting in rotation.	50	2.7	55	2.8	46	4.3
L04	Yes	Explain most efficient engine.	54	2.7	58	3.8	51	4.1
L07	Yes	Relate sound transmission to air.	75	2.3	80	3.1	71	3.5
M12	Yes	Complete table of voltage/current data for circuit.	62	2.5	69	3.7	55	3.8
M14	Yes	Draw reflected image of object.	60	2.7	58	3.7	62	4.0
N08	Yes	Relate lever arm lengths to balanced weights.	70	2.3	73	3.8	68	3.0
N10	Yes	Determine effect of tipping container on water surface.	49	2.6	64	3.6	34	3.1
O10	Yes	Identify polarity of ends of cut magnet.	61	3.1	64	4.8	57	3.6
O13	Yes	Relate circular motion to centripetal force.	56	2.4	63	3.6	50	3.1
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	92	1.4	91	2.2	93	1.8
P02	Yes	Explain relationship between illuminance and distance of light source.	21	2.1	23	3.0	19	2.3
P05	Yes	Explain why balloon expands upon heating.	59	3.0	67	4.0	51	4.6
Q12	Yes	Explain how focusing affects the amount of light.	48	2.8	46	3.4	49	4.2
Q13	Yes	Compare heat expansion properties of metal and glass.	58	2.7	57	3.4	59	3.7
Q18	Yes	Explain effect of melting on the mass of ice cubes.	27	2.5	30	3.4	23	3.3
R01	Yes	Choose diagram showing angle of reflected light.	66	2.8	65	3.9	67	3.7
R02	Yes	Identify reflection/absorption properties from color.	46	2.7	46	4.0	47	3.6
Y01	Yes	Explain amount of light/electric energy in a lamp.	4	0.8	5	1.2	3	1.0
Y02	Yes	Explain temperature of melting snowball.	11	1.3	12	2.0	10	1.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Israel SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	82	1.4	84	1.8	80	2.1
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	86	1.4	89	1.7	84	2.4
F06	No	Relate rusting iron to the presence of oxygen and moisture.	69	2.7	75	2.9	64	3.8
G10	No	Select correct statement regarding the atomic makeup of matter.	61	2.3	68	3.5	57	3.5
H06	No	Know if wood-burning reaction absorbs or releases energy.	69	2.5	73	3.2	65	4.3
J03	Yes	Know relationship between molecules, atoms and cells.	26	3.6	30	5.4	23	4.7
J04	Yes	Distiguish between a chemical reaction and a physical change.	57	4.3	59	4.4	57	6.9
J06	Yes	Know what happens to atoms in animal after death.	20	3.5	29	5.1	11	4.2
J08	Yes	Identify gas involved in fire ignition.	55	3.8	66	5.3	46	4.0
M10	Yes	Identify substances which are mixtures.	39	3.6	40	4.5	35	5.3
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	62	2.3	67	4.5	62	4.5
N07	Yes	Explain oxygen fuel requirements of burning candle.	82	2.9	93	2.5	71	5.4
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	35	3.6	31	6.3	39	5.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	47	4.8	54	5.3	45	7.4
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	72	4.9	79	4.6	69	8.0
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	49	3.9	44	5.0	51	7.0
Q15	Yes	Determine physical processes involving chemical change.	23	3.5	23	5.3	24	5.1
R05	Yes	Explain how carbon dioxide fire extinguishers work.	63	4.5	76	4.6	50	5.6
Z01A	Yes	Explain why steel bridges must be painted.	59	5.1	59	8.7	56	5.2
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	42	4.9	47	6.5	37	5.2
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	21	3.6	24	4.8	17	4.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Israel SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	75	1.4	77	2.1	75	1.6
B01	No	Identify hottest layer of the Earth.	75	2.4	83	2.2	69	3.9
B05	No	Use elevation/weather diagram to locate earth feature.	60	2.4	61	3.3	60	4.5
C07	No	Relate mountain shape to age.	28	2.2	31	3.8	24	2.8
D03	No	Identify direction of river flow on contour map.	26	2.0	33	2.9	17	2.5
E09	No	Use table of time/temperature to determine point when weather changes.	79	1.9	80	2.3	78	3.3
E12	No	Identify type of stone involved in cave formation.	70	2.3	73	2.5	67	3.4
F05	No	Relate level of oxygen to elevation.	87	1.8	92	1.8	85	2.8
G11	No	Identify type of rock from description of its formation.	53	2.3	54	3.2	53	3.8
H03	No	Select explanation for moonlight.	77	2.4	81	2.5	76	2.8
H04	No	Identify ground layer containing the most organic material.	41	2.6	47	3.6	37	3.1
I17	Yes	Know energy source for Earth’s water cycle.	51	3.5	56	5.8	47	5.3
J01	Yes	Know changes in Earth’s surface over billions of years.	44	3.8	46	6.1	43	5.6
K15	Yes	Know organic origins of fossil fuels.	54	4.1	66	4.5	43	6.9
O12	Yes	Know relative amounts of components in air.	33	4.6	40	6.3	29	6.8
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	49	5.2	57	6.5	45	5.5
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	79	3.8	77	5.6	82	3.9
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	54	4.2	60	5.7	46	6.3
Q16	Yes	Estimate time for light from star to reach Earth.	14	3.1	12	3.3	17	6.0
R04	Yes	Give reason why ozone layer is important for life.	63	4.9	73	4.8	53	6.8
W01A	Yes	Give reason region in land/water diagram is a good farming location.	84	2.4	88	3.5	85	4.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	35	3.8	40	4.4	30	4.6
W02	Yes	Draw diagram showing Earth’s water cycle.	17	2.3	21	3.1	14	3.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Israel SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	39	2.4	41	3.5	37	2.4
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	56	2.7	64	2.9	49	3.4
F04	No	Predict type of area where soil erosion by rain is most likely.	63	2.3	70	2.7	58	3.1
G12	No	Identify a nonrenewable natural resource.	55	2.1	62	3.6	51	3.2
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	32	3.6	44	5.9	24	4.3
I13	Yes	Select best scale for accurate measurement.	68	3.4	77	4.9	62	4.9
I15	Yes	Identify the type of scientific statement given in an experimental report.	31	3.5	30	4.8	32	5.1
I18	Yes	Write conclusion from summary of experimental observations.	60	4.7	60	6.4	60	5.4
K19	Yes	Write an example of how computers are used to do work.	85	2.3	90	3.6	87	3.1
N01	Yes	Determine correct control experiment to test hypothesis.	52	4.6	52	6.2	49	7.2
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	64	3.9	77	5.9	55	5.0
N05	Yes	Identify a principal cause of acid rain.	30	3.4	38	6.4	23	4.5
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	28	3.8	24	6.1	31	6.3
Z02A	Yes	Write a reason why not all people have enough water.	68	4.8	69	6.2	64	6.4
Z02B	Yes	Write a second reason why not all people have enough water.	48	5.6	55	6.7	45	7.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Israel SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	67	2.1	60	3.3	74	2.1
B04	No	Predict pulse/breathing rate change after exercise.	91	1.2	93	1.2	90	1.6
C08	No	Identify carrier of signals from eye to brain.	72	2.1	72	3.6	73	3.2
D05	No	Identify system carrying sensory messages to the brain.	81	1.6	83	2.1	78	2.5
D06	No	Relate plant part to seed development.	61	2.2	65	3.1	56	3.9
E08	No	Select correct statement of trait heredity from parents.	91	1.0	91	1.4	93	1.7
E10	No	Determine characteristics for classifying animals.	71	2.2	72	3.2	70	3.6
F01	No	Identify characteristic of mammal.	73	2.1	78	2.6	71	2.6
F03	No	Identify human organ which interprets senses.	54	2.4	61	3.2	50	2.8
G08	No	Identify main function of red blood cells.	65	2.6	73	3.2	58	3.3
G09	No	Identify reproductive cells involved in heredity.	89	1.5	91	1.8	89	2.3
H01	No	Identify the functions of blood.	67	2.2	64	2.9	70	2.6
H02	No	Identify the role of vitamins.	81	2.2	81	3.0	80	3.6
I10	Yes	Identify nutrition content of fruits and vegetables.	87	2.0	83	4.2	92	2.3
I11	Yes	Know identifying features of insects.	36	4.0	38	6.6	35	5.2
I14	Yes	Relate elbow action to a simple machine.	68	3.4	83	5.7	57	5.9
I19	Yes	Identify statement of oxygen production consistent with data.	46	4.7	50	6.4	44	5.1
J02	Yes	Choose species on Earth for shortest time.	71	3.8	69	4.9	74	5.6
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	60	3.8	61	5.6	55	5.1
J09	Yes	Explain how to determine the age of a cut tree.	63	2.8	63	5.3	65	2.8
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	60	3.1	64	5.0	60	4.7
K12	Yes	Relate reproductive cell production to population.	79	3.7	83	4.1	82	5.2
K16	Yes	Identify common product made with bacteria.	16	2.5	17	3.9	15	3.4
K18	Yes	Identify main function of chloroplasts in plant cell.	42	4.4	48	5.1	40	7.2
L02	Yes	Select reason why algae are close to ocean surface.	47	3.8	54	6.0	42	5.5
L03	Yes	Identify skull features typical of predators.	78	3.1	83	4.2	74	4.5
L05	Yes	Select most likely purpose for birds' singing.	69	3.7	67	5.0	69	4.5
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	39	4.2	34	6.3	44	5.1
M11	Yes	Complete a food web showing energy relationships.	54	4.2	60	5.2	53	5.8
N02	Yes	Choose meal which would give the most nutrients.	34	3.7	32	5.5	37	5.6
N04	Yes	Identify how decaying fish fertilize plants.	54	4.2	54	5.3	51	5.3
N06	Yes	Identify the most basic unit of living things.	63	4.3	68	4.9	62	6.9
O16	Yes	Give reason for thirst on a hot day.	71	4.1	78	4.0	67	5.9
O17	Yes	Describe how disease may be transmitted.	78	3.6	86	4.0	69	6.3
P04	Yes	Identify what happens to animals' biological processes during hibernation.	65	3.5	66	5.8	65	4.4
P06	Yes	Describe digestion occuring in the mouth.	48	4.0	56	5.5	41	5.9
Q17	Yes	Describe the advantage of having two eyes.	73	4.5	71	6.1	75	5.7
R03	Yes	Give example of consequences of introducing new species.	19	3.3	22	4.2	15	4.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	26	3.0	22	3.4	32	3.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	59	3.0	69	4.9	51	3.4
X02B	Yes	Explain why light is important in aquarium ecosystem.	29	2.9	35	3.7	24	3.9

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Israel SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	76	1.7	79	2.1	75	2.1
A10	No	Relate light level and reflectance to vision of object.	73	1.7	77	2.1	70	2.4
B02	No	Know type of energy released from combustion engine.	61	2.9	59	4.1	62	3.3
B03	No	Determine density from mass/volume table.	38	2.6	43	2.3	35	3.6
B06	No	Relate color of object to amount of light reflection.	92	1.3	91	1.2	93	1.9
C09	No	Identify correct position of reflected image.	68	2.1	72	3.0	65	3.2
C12	No	Identify substance which is NOT a fossil fuel.	73	1.9	77	3.2	68	2.8
D01	No	Identify correct diagram of light rays through lens.	34	2.2	45	3.3	21	3.0
D02	No	Identify substance from magnetic properties.	68	2.8	71	3.3	67	3.7
D04	No	Relate physical event to its sequence of energy changes.	59	2.5	66	3.2	52	4.0
E07	No	Identify particles found in the nucleus of atoms.	41	2.7	44	3.9	39	3.6
E11	No	Find shadow size from diagram of bulb/card/screen distances.	63	1.6	65	2.6	64	2.3
F02	No	Relate color and light reflection to temperature of object.	86	1.9	90	1.7	84	2.9
G07	No	Identify correct way to place batteries in a flashlight.	89	1.1	90	1.8	88	2.0
H05	No	Identify source of energy stored in food.	12	1.8	14	2.3	12	2.0
I16	Yes	Identify material with greatest heat conductivity.	78	3.1	88	4.7	71	4.2
J05	Yes	Identify type of solar radiation that causes sunburn.	56	4.1	63	4.7	56	5.8
K10	Yes	Describe a method demonstrating the existence of air.	34	4.0	37	4.6	34	5.5
K13	Yes	Identify electrical conductors that form complete circuits.	86	1.9	90	2.6	88	2.9
K14	Yes	Relate evaporation rate to surface area.	75	2.4	79	3.8	77	3.2
K17	Yes	Relate presence of gravitational force to position of falling object.	61	2.9	66	4.7	61	5.6
L01	Yes	Select diagram showing forces resulting in rotation.	34	3.4	42	5.0	27	5.4
L04	Yes	Explain most efficient engine.	53	3.9	61	4.3	48	5.8
L07	Yes	Relate sound transmission to air.	76	3.4	75	4.0	78	4.1
M12	Yes	Complete table of voltage/current data for circuit.	55	3.9	69	4.6	45	6.1
M14	Yes	Draw reflected image of object.	78	4.0	77	5.6	81	4.9
N08	Yes	Relate lever arm lengths to balanced weights.	63	5.0	76	5.6	50	6.9
N10	Yes	Determine effect of tipping container on water surface.	36	3.8	47	6.7	22	4.1
O10	Yes	Identify polarity of ends of cut magnet.	55	4.8	58	6.2	56	7.4
O13	Yes	Relate circular motion to centripetal force.	56	3.6	61	5.8	53	4.6
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	83	3.6	87	3.7	82	6.4
P02	Yes	Explain relationship between illuminance and distance of light source.	43	5.2	52	6.3	34	5.3
P05	Yes	Explain why balloon expands upon heating.	76	3.4	75	4.3	76	5.0
Q12	Yes	Explain how focusing affects the amount of light.	51	4.6	64	5.6	40	5.4
Q13	Yes	Compare heat expansion properties of metal and glass.	54	5.0	62	6.1	48	5.5
Q18	Yes	Explain effect of melting on the mass of ice cubes.	41	3.3	48	4.1	35	4.2
R01	Yes	Choose diagram showing angle of reflected light.	68	4.1	71	6.1	64	4.5
R02	Yes	Identify reflection/absorption properties from color.	39	3.3	46	6.0	32	5.3
Y01	Yes	Explain amount of light/electric energy in a lamp.	6	1.1	7	1.6	5	1.9
Y02	Yes	Explain temperature of melting snowball.	9	1.7	9	3.0	11	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Japan SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	92	0.4	92	0.6	92	0.5
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	88	0.8	87	1.2	89	1.2
F06	No	Relate rusting iron to the presence of oxygen and moisture.	70	1.2	72	1.5	69	1.8
G10	No	Select correct statement regarding the atomic makeup of matter.	58	1.2	64	1.6	51	1.7
H06	No	Know if wood-burning reaction absorbs or releases energy.	60	1.2	63	1.7	57	1.8
J03	Yes	Know relationship between molecules, atoms and cells.	47	2.2	47	3.0	46	2.9
J04	Yes	Distiguish between a chemical reaction and a physical change.	60	2.2	59	2.5	61	3.1
J06	Yes	Know what happens to atoms in animal after death.	39	2.5	42	3.1	35	2.8
J08	Yes	Identify gas involved in fire ignition.	74	1.9	79	2.3	70	3.0
M10	Yes	Identify substances which are mixtures.	62	1.7	63	2.7	62	2.8
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	64	1.9	70	2.2	58	2.8
N07	Yes	Explain oxygen fuel requirements of burning candle.	90	1.2	91	1.4	89	1.9
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	67	2.0	64	2.8	70	2.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	47	1.9	47	2.7	46	2.6
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	33	2.0	38	2.5	26	2.9
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	84	1.5	84	2.4	84	1.9
Q15	Yes	Determine physical processes involving chemical change.	54	1.9	57	2.7	51	2.6
R05	Yes	Explain how carbon dioxide fire extinguishers work.	45	2.0	50	2.8	40	2.6
Z01A	Yes	Explain why steel bridges must be painted.	34	2.3	34	2.9	33	3.0
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	61	2.0	63	2.7	58	3.4
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	44	1.9	44	2.7	45	3.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Japan SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	84	0.6	84	0.8	83	0.8
B01	No	Identify hottest layer of the Earth.	87	0.7	90	0.8	82	1.2
B05	No	Use elevation/weather diagram to locate earth feature.	56	1.0	59	1.3	52	1.7
C07	No	Relate mountain shape to age.	34	1.4	36	1.9	33	1.5
D03	No	Identify direction of river flow on contour map.	55	1.3	61	1.9	48	1.6
E09	No	Use table of time/temperature to determine point when weather changes.	95	0.5	95	0.9	95	0.7
E12	No	Identify type of stone involved in cave formation.	29	1.5	32	2.0	26	1.7
F05	No	Relate level of oxygen to elevation.	76	1.1	77	1.6	76	1.8
G11	No	Identify type of rock from description of its formation.	65	1.2	63	1.7	67	1.6
H03	No	Select explanation for moonlight.	84	1.0	87	1.2	81	1.4
H04	No	Identify ground layer containing the most organic material.	48	1.2	47	1.7	48	1.8
I17	Yes	Know energy source for Earth’s water cycle.	54	1.9	59	2.4	49	3.2
J01	Yes	Know changes in Earth’s surface over billions of years.	46	2.0	47	2.9	45	3.0
K15	Yes	Know organic origins of fossil fuels.	53	2.3	62	3.2	44	3.1
O12	Yes	Know relative amounts of components in air.	54	2.2	61	2.6	45	3.0
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	75	1.8	78	2.3	71	2.6
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	84	1.5	87	2.1	80	2.4
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	55	2.0	61	2.3	49	3.1
Q16	Yes	Estimate time for light from star to reach Earth.	34	2.1	35	2.9	32	2.4
R04	Yes	Give reason why ozone layer is important for life.	60	2.0	66	2.7	53	2.8
W01A	Yes	Give reason region in land/water diagram is a good farming location.	91	0.7	92	1.1	91	1.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	25	1.3	26	1.7	24	1.7
W02	Yes	Draw diagram showing Earth’s water cycle.	43	1.6	47	2.3	39	2.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Japan SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	66	0.8	65	1.2	66	1.0
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	67	1.6	74	1.8	60	1.8
F04	No	Predict type of area where soil erosion by rain is most likely.	79	0.9	78	1.1	79	1.3
G12	No	Identify a nonrenewable natural resource.	33	1.2	43	1.9	24	1.6
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	69	1.8	71	2.6	67	2.7
I13	Yes	Select best scale for accurate measurement.	81	1.7	83	2.1	79	2.1
I15	Yes	Identify the type of scientific statement given in an experimental report.	42	2.2	41	3.0	43	2.8
I18	Yes	Write conclusion from summary of experimental observations.	67	1.8	68	2.4	67	2.5
K19	Yes	Write an example of how computers are used to do work.	75	1.8	71	2.7	79	2.1
N01	Yes	Determine correct control experiment to test hypothesis.	57	1.9	57	2.7	58	2.6
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	30	2.1	29	2.4	31	2.8
N05	Yes	Identify a principal cause of acid rain.	46	2.0	46	3.1	46	2.9
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	39	2.0	47	3.1	31	2.5
Z02A	Yes	Write a reason why not all people have enough water.	87	1.5	86	1.9	88	2.1
Z02B	Yes	Write a second reason why not all people have enough water.	55	2.0	53	2.6	56	2.9

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Japan SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	64	0.7	62	0.9	65	1.0
B04	No	Predict pulse/breathing rate change after exercise.	96	0.4	96	0.5	96	0.6
C08	No	Identify carrier of signals from eye to brain.	92	0.7	91	1.0	92	1.0
D05	No	Identify system carrying sensory messages to the brain.	87	0.8	87	1.1	86	1.3
D06	No	Relate plant part to seed development.	82	1.0	80	1.1	84	1.4
E08	No	Select correct statement of trait heredity from parents.	70	1.2	68	1.8	71	1.6
E10	No	Determine characteristics for classifying animals.	82	1.1	84	1.3	79	1.5
F01	No	Identify characteristic of mammal.	85	0.9	85	1.3	85	1.2
F03	No	Identify human organ which interprets senses.	50	1.3	53	1.8	47	1.6
G08	No	Identify main function of red blood cells.	81	1.1	82	1.3	81	1.5
G09	No	Identify reproductive cells involved in heredity.	69	1.2	66	1.7	72	1.3
H01	No	Identify the functions of blood.	82	0.8	82	1.3	81	1.4
H02	No	Identify the role of vitamins.	62	1.3	66	1.8	58	1.7
I10	Yes	Identify nutrition content of fruits and vegetables.	87	1.2	87	1.9	88	1.7
I11	Yes	Know identifying features of insects.	82	1.6	85	2.3	79	2.5
I14	Yes	Relate elbow action to a simple machine.	50	2.1	54	2.7	46	2.9
I19	Yes	Identify statement of oxygen production consistent with data.	77	1.6	78	2.0	75	2.5
J02	Yes	Choose species on Earth for shortest time.	74	1.7	80	2.2	68	2.7
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	86	1.5	82	2.1	89	2.0
J09	Yes	Explain how to determine the age of a cut tree.	88	1.5	88	1.9	88	2.0
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	80	1.4	80	2.4	80	2.1
K12	Yes	Relate reproductive cell production to population.	75	1.7	75	2.5	74	2.5
K16	Yes	Identify common product made with bacteria.	69	2.0	72	2.6	66	2.6
K18	Yes	Identify main function of chloroplasts in plant cell.	89	1.3	88	1.7	90	1.6
L02	Yes	Select reason why algae are close to ocean surface.	77	2.1	83	2.4	71	2.7
L03	Yes	Identify skull features typical of predators.	83	1.5	82	2.3	84	2.0
L05	Yes	Select most likely purpose for birds' singing.	86	1.3	84	2.0	88	1.7
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	49	2.4	48	3.4	51	3.1
M11	Yes	Complete a food web showing energy relationships.	85	1.3	84	1.9	87	2.0
N02	Yes	Choose meal which would give the most nutrients.	41	2.0	39	2.8	42	2.7
N04	Yes	Identify how decaying fish fertilize plants.	43	2.0	43	2.8	42	2.8
N06	Yes	Identify the most basic unit of living things.	62	1.9	68	2.5	55	2.9
O16	Yes	Give reason for thirst on a hot day.	88	1.3	87	1.8	89	2.0
O17	Yes	Describe how disease may be transmitted.	91	1.2	89	1.9	92	1.5
P04	Yes	Identify what happens to animals' biological processes during hibernation.	59	2.4	65	3.3	52	3.3
P06	Yes	Describe digestion occuring in the mouth.	43	2.1	42	2.7	45	3.1
Q17	Yes	Describe the advantage of having two eyes.	75	1.5	77	2.4	73	2.5
R03	Yes	Give example of consequences of introducing new species.	5	0.9	7	1.4	3	1.0
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	20	1.4	17	1.9	22	1.5
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	85	1.0	86	1.5	84	1.4
X02B	Yes	Explain why light is important in aquarium ecosystem.	56	1.8	59	2.2	53	2.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Japan SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	81	0.7	81	0.8	82	0.8
A10	No	Relate light level and reflectance to vision of object.	61	0.7	62	1.1	60	1.0
B02	No	Know type of energy released from combustion engine.	62	1.0	61	1.4	62	1.5
B03	No	Determine density from mass/volume table.	41	1.1	45	1.5	37	1.5
B06	No	Relate color of object to amount of light reflection.	86	0.8	87	1.0	84	1.1
C09	No	Identify correct position of reflected image.	78	0.9	81	1.2	75	1.6
C12	No	Identify substance which is NOT a fossil fuel.	62	1.2	65	1.8	58	1.6
D01	No	Identify correct diagram of light rays through lens.	88	0.9	90	1.0	87	1.2
D02	No	Identify substance from magnetic properties.	89	0.9	91	1.1	87	1.3
D04	No	Relate physical event to its sequence of energy changes.	61	1.1	62	1.5	60	1.7
E07	No	Identify particles found in the nucleus of atoms.	30	1.2	33	1.7	27	1.5
E11	No	Find shadow size from diagram of bulb/card/screen distances.	72	1.1	75	1.3	69	1.6
F02	No	Relate color and light reflection to temperature of object.	76	1.1	81	1.3	71	1.4
G07	No	Identify correct way to place batteries in a flashlight.	94	0.5	95	0.7	92	1.0
H05	No	Identify source of energy stored in food.	53	1.3	49	1.9	58	1.7
I16	Yes	Identify material with greatest heat conductivity.	96	0.8	95	1.2	98	0.9
J05	Yes	Identify type of solar radiation that causes sunburn.	85	1.6	82	2.2	89	1.7
K10	Yes	Describe a method demonstrating the existence of air.	28	1.8	27	2.3	29	2.3
K13	Yes	Identify electrical conductors that form complete circuits.	92	1.1	93	1.5	91	1.6
K14	Yes	Relate evaporation rate to surface area.	93	0.9	93	1.3	94	1.4
K17	Yes	Relate presence of gravitational force to position of falling object.	58	2.2	65	2.7	51	3.1
L01	Yes	Select diagram showing forces resulting in rotation.	78	1.5	77	2.2	78	2.1
L04	Yes	Explain most efficient engine.	36	2.0	39	3.4	33	2.6
L07	Yes	Relate sound transmission to air.	90	1.2	91	1.8	89	1.7
M12	Yes	Complete table of voltage/current data for circuit.	73	1.8	78	2.2	67	2.6
M14	Yes	Draw reflected image of object.	84	1.4	83	2.0	85	1.9
N08	Yes	Relate lever arm lengths to balanced weights.	83	1.5	80	2.2	86	1.9
N10	Yes	Determine effect of tipping container on water surface.	61	1.7	68	2.6	53	2.7
O10	Yes	Identify polarity of ends of cut magnet.	70	2.2	72	2.7	69	2.8
O13	Yes	Relate circular motion to centripetal force.	68	1.7	71	2.3	65	2.6
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	94	0.9	94	1.1	94	1.4
P02	Yes	Explain relationship between illuminance and distance of light source.	37	2.0	42	3.2	33	2.7
P05	Yes	Explain why balloon expands upon heating.	67	2.2	71	3.0	63	2.8
Q12	Yes	Explain how focusing affects the amount of light.	60	2.4	62	3.2	58	2.8
Q13	Yes	Compare heat expansion properties of metal and glass.	54	1.8	55	2.9	52	2.6
Q18	Yes	Explain effect of melting on the mass of ice cubes.	56	2.2	54	3.3	58	2.7
R01	Yes	Choose diagram showing angle of reflected light.	92	0.9	94	1.4	90	1.6
R02	Yes	Identify reflection/absorption properties from color.	54	2.1	53	2.8	55	2.8
Y01	Yes	Explain amount of light/electric energy in a lamp.	7	0.8	11	1.5	4	0.7
Y02	Yes	Explain temperature of melting snowball.	12	0.9	13	1.4	10	1.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Korea SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	80	0.8	81	1.0	80	1.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	80	1.2	79	1.9	81	1.6
F06	No	Relate rusting iron to the presence of oxygen and moisture.	76	1.1	79	1.3	72	2.0
G10	No	Select correct statement regarding the atomic makeup of matter.	60	1.9	65	2.0	54	2.7
H06	No	Know if wood-burning reaction absorbs or releases energy.	65	1.7	70	1.7	58	2.6
J03	Yes	Know relationship between molecules, atoms and cells.	30	2.3	32	3.2	26	3.5
J04	Yes	Distiguish between a chemical reaction and a physical change.	70	2.5	71	3.6	69	3.8
J06	Yes	Know what happens to atoms in animal after death.	32	2.3	33	3.1	30	3.9
J08	Yes	Identify gas involved in fire ignition.	78	1.9	77	2.9	79	2.6
M10	Yes	Identify substances which are mixtures.	51	2.2	51	3.1	51	3.2
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	70	2.2	75	3.0	65	3.7
N07	Yes	Explain oxygen fuel requirements of burning candle.	93	1.3	94	1.7	92	1.9
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	88	1.8	90	2.3	85	2.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	53	2.5	58	3.8	46	3.3
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	45	3.0	48	4.0	42	4.4
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	72	2.3	69	3.1	76	3.4
Q15	Yes	Determine physical processes involving chemical change.	48	3.0	43	4.0	54	4.4
R05	Yes	Explain how carbon dioxide fire extinguishers work.	54	2.5	58	3.5	49	3.5
Z01A	Yes	Explain why steel bridges must be painted.	42	2.8	47	3.8	35	4.1
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	73	2.3	75	3.3	70	4.0
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	62	2.4	61	3.4	64	3.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Korea SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	64	1.0	67	1.4	60	1.4
B01	No	Identify hottest layer of the Earth.	84	1.1	90	1.2	77	1.8
B05	No	Use elevation/weather diagram to locate earth feature.	54	1.3	58	1.8	50	1.6
C07	No	Relate mountain shape to age.	57	1.7	57	2.2	58	2.6
D03	No	Identify direction of river flow on contour map.	44	1.6	50	2.0	37	2.4
E09	No	Use table of time/temperature to determine point when weather changes.	79	1.2	78	1.8	80	1.9
E12	No	Identify type of stone involved in cave formation.	79	1.4	79	1.8	79	2.3
F05	No	Relate level of oxygen to elevation.	89	1.0	91	1.3	87	1.5
G11	No	Identify type of rock from description of its formation.	81	1.1	79	1.5	82	2.0
H03	No	Select explanation for moonlight.	78	1.5	83	2.1	72	2.1
H04	No	Identify ground layer containing the most organic material.	60	1.8	59	2.1	61	2.4
I17	Yes	Know energy source for Earth’s water cycle.	35	2.6	33	3.3	38	3.4
J01	Yes	Know changes in Earth’s surface over billions of years.	75	2.3	76	3.2	74	3.3
K15	Yes	Know organic origins of fossil fuels.	84	2.2	87	2.4	80	3.4
O12	Yes	Know relative amounts of components in air.	41	3.2	50	4.3	31	3.5
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	65	2.8	71	3.7	58	4.4
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	90	1.5	89	2.4	90	2.0
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	77	2.2	80	3.1	74	3.0
Q16	Yes	Estimate time for light from star to reach Earth.	12	1.7	12	2.2	12	2.6
R04	Yes	Give reason why ozone layer is important for life.	57	2.5	60	3.4	54	3.6
W01A	Yes	Give reason region in land/water diagram is a good farming location.	92	1.2	91	1.6	92	1.7
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	35	2.1	35	2.7	34	3.3
W02	Yes	Draw diagram showing Earth’s water cycle.	23	1.7	26	2.6	20	2.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Korea SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	47	1.0	47	1.3	47	1.6
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	55	1.6	60	2.0	48	2.3
F04	No	Predict type of area where soil erosion by rain is most likely.	84	1.3	89	1.3	79	1.9
G12	No	Identify a nonrenewable natural resource.	71	1.7	80	1.7	60	2.6
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	47	2.8	55	3.8	37	4.3
I13	Yes	Select best scale for accurate measurement.	72	2.3	77	2.7	65	3.9
I15	Yes	Identify the type of scientific statement given in an experimental report.	56	2.7	59	3.6	52	3.9
I18	Yes	Write conclusion from summary of experimental observations.	59	2.8	64	3.0	52	4.7
K19	Yes	Write an example of how computers are used to do work.	87	1.7	84	2.6	91	2.3
N01	Yes	Determine correct control experiment to test hypothesis.	36	2.8	37	3.8	34	4.1
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	79	2.4	80	3.0	78	3.8
N05	Yes	Identify a principal cause of acid rain.	50	3.0	52	4.1	48	3.9
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	85	1.8	84	2.5	86	2.8
Z02A	Yes	Write a reason why not all people have enough water.	73	2.1	72	3.2	74	3.4
Z02B	Yes	Write a second reason why not all people have enough water.	56	2.6	54	3.6	59	4.2

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Korea SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	49	1.1	53	1.6	43	1.6
B04	No	Predict pulse/breathing rate change after exercise.	92	0.8	92	1.0	91	0.9
C08	No	Identify carrier of signals from eye to brain.	90	0.8	88	1.3	92	1.6
D05	No	Identify system carrying sensory messages to the brain.	82	1.4	82	1.8	83	1.7
D06	No	Relate plant part to seed development.	82	1.2	84	1.5	79	1.7
E08	No	Select correct statement of trait heredity from parents.	70	1.4	70	1.8	70	2.4
E10	No	Determine characteristics for classifying animals.	74	1.5	77	1.9	69	2.2
F01	No	Identify characteristic of mammal.	80	1.2	82	1.5	77	1.8
F03	No	Identify human organ which interprets senses.	57	1.6	63	2.1	50	2.7
G08	No	Identify main function of red blood cells.	62	1.9	63	2.7	61	2.4
G09	No	Identify reproductive cells involved in heredity.	77	1.4	72	2.2	83	1.7
H01	No	Identify the functions of blood.	77	1.4	79	1.9	75	2.3
H02	No	Identify the role of vitamins.	93	0.9	94	1.0	91	1.4
I10	Yes	Identify nutrition content of fruits and vegetables.	81	2.8	79	3.2	84	3.7
I11	Yes	Know identifying features of insects.	74	2.4	77	3.0	71	3.9
I14	Yes	Relate elbow action to a simple machine.	36	2.3	39	2.8	33	3.5
I19	Yes	Identify statement of oxygen production consistent with data.	80	2.2	80	2.8	79	3.7
J02	Yes	Choose species on Earth for shortest time.	58	2.8	60	3.1	54	4.8
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	78	1.9	76	2.8	81	2.9
J09	Yes	Explain how to determine the age of a cut tree.	95	1.2	95	1.6	95	1.7
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	77	2.2	76	3.4	79	3.1
K12	Yes	Relate reproductive cell production to population.	81	2.1	83	2.8	78	3.4
K16	Yes	Identify common product made with bacteria.	88	1.6	89	2.1	87	2.3
K18	Yes	Identify main function of chloroplasts in plant cell.	86	2.0	85	2.5	87	3.1
L02	Yes	Select reason why algae are close to ocean surface.	65	2.1	70	3.2	60	3.5
L03	Yes	Identify skull features typical of predators.	79	2.2	85	2.7	72	3.3
L05	Yes	Select most likely purpose for birds' singing.	92	1.3	94	1.5	89	2.1
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	41	2.5	44	3.7	38	3.7
M11	Yes	Complete a food web showing energy relationships.	91	1.6	92	2.2	90	2.3
N02	Yes	Choose meal which would give the most nutrients.	54	2.5	46	3.2	64	3.7
N04	Yes	Identify how decaying fish fertilize plants.	77	2.3	75	3.2	80	3.1
N06	Yes	Identify the most basic unit of living things.	80	1.8	82	2.3	78	3.1
O16	Yes	Give reason for thirst on a hot day.	78	2.3	79	3.6	78	2.9
O17	Yes	Describe how disease may be transmitted.	61	2.8	64	3.8	58	3.8
P04	Yes	Identify what happens to animals' biological processes during hibernation.	64	2.7	63	3.6	66	3.5
P06	Yes	Describe digestion occuring in the mouth.	53	2.6	50	3.6	57	4.1
Q17	Yes	Describe the advantage of having two eyes.	69	2.8	71	3.3	66	4.4
R03	Yes	Give example of consequences of introducing new species.	32	2.4	31	3.8	33	3.4
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	23	1.9	23	2.4	22	3.1
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	67	1.9	69	2.9	65	2.5
X02B	Yes	Explain why light is important in aquarium ecosystem.	56	1.7	56	2.6	56	2.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Korea SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	74	0.9	78	1.0	69	1.3
A10	No	Relate light level and reflectance to vision of object.	77	0.9	81	1.1	72	1.2
B02	No	Know type of energy released from combustion engine.	64	1.2	68	1.5	60	2.0
B03	No	Determine density from mass/volume table.	45	1.4	46	1.9	43	2.2
B06	No	Relate color of object to amount of light reflection.	78	1.2	82	1.3	73	1.7
C09	No	Identify correct position of reflected image.	76	1.6	77	1.9	74	2.2
C12	No	Identify substance which is NOT a fossil fuel.	62	1.3	64	2.1	59	2.1
D01	No	Identify correct diagram of light rays through lens.	67	1.5	72	1.9	60	2.3
D02	No	Identify substance from magnetic properties.	86	1.0	88	1.4	85	1.4
D04	No	Relate physical event to its sequence of energy changes.	46	1.7	50	2.4	40	2.2
E07	No	Identify particles found in the nucleus of atoms.	44	1.7	47	2.1	39	2.5
E11	No	Find shadow size from diagram of bulb/card/screen distances.	79	1.4	80	2.1	78	1.9
F02	No	Relate color and light reflection to temperature of object.	83	1.1	88	1.4	78	1.7
G07	No	Identify correct way to place batteries in a flashlight.	97	0.5	97	0.7	96	0.8
H05	No	Identify source of energy stored in food.	39	1.5	40	2.2	39	2.1
I16	Yes	Identify material with greatest heat conductivity.	92	1.5	91	2.1	93	2.1
J05	Yes	Identify type of solar radiation that causes sunburn.	66	2.6	66	3.7	66	3.1
K10	Yes	Describe a method demonstrating the existence of air.	36	3.0	40	4.2	31	4.1
K13	Yes	Identify electrical conductors that form complete circuits.	93	1.3	96	1.4	88	2.4
K14	Yes	Relate evaporation rate to surface area.	96	1.2	99	0.8	92	2.3
K17	Yes	Relate presence of gravitational force to position of falling object.	72	2.6	74	3.8	71	3.4
L01	Yes	Select diagram showing forces resulting in rotation.	65	2.5	74	2.8	54	3.8
L04	Yes	Explain most efficient engine.	47	2.6	53	3.3	40	3.8
L07	Yes	Relate sound transmission to air.	90	1.5	92	1.7	87	2.5
M12	Yes	Complete table of voltage/current data for circuit.	73	2.6	79	3.3	66	4.1
M14	Yes	Draw reflected image of object.	81	2.2	87	2.3	74	3.6
N08	Yes	Relate lever arm lengths to balanced weights.	86	1.7	84	2.5	87	2.4
N10	Yes	Determine effect of tipping container on water surface.	52	3.0	60	4.3	43	4.2
O10	Yes	Identify polarity of ends of cut magnet.	66	2.8	69	3.6	62	4.5
O13	Yes	Relate circular motion to centripetal force.	52	2.6	60	3.6	42	3.2
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	90	1.7	88	2.6	92	2.0
P02	Yes	Explain relationship between illuminance and distance of light source.	37	2.5	38	3.7	36	3.7
P05	Yes	Explain why balloon expands upon heating.	75	2.6	72	3.6	78	3.5
Q12	Yes	Explain how focusing affects the amount of light.	76	2.6	73	3.8	78	3.6
Q13	Yes	Compare heat expansion properties of metal and glass.	41	2.8	41	3.4	41	4.2
Q18	Yes	Explain effect of melting on the mass of ice cubes.	35	2.5	34	3.3	35	3.7
R01	Yes	Choose diagram showing angle of reflected light.	82	1.9	84	2.9	81	2.8
R02	Yes	Identify reflection/absorption properties from color.	58	2.2	56	3.1	60	3.3
Y01	Yes	Explain amount of light/electric energy in a lamp.	14	1.5	15	1.9	13	2.1
Y02	Yes	Explain temperature of melting snowball.	24	1.7	25	2.7	24	2.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Kuwait SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	57	1.5	.	.	.	.
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	70	2.2	.	.	.	.
F06	No	Relate rusting iron to the presence of oxygen and moisture.	71	2.3	.	.	.	.
G10	No	Select correct statement regarding the atomic makeup of matter.	37	3.0	.	.	.	.
H06	No	Know if wood-burning reaction absorbs or releases energy.	38	2.8	.	.	.	.
J03	Yes	Know relationship between molecules, atoms and cells.	20	2.8	.	.	.	.
J04	Yes	Distiguish between a chemical reaction and a physical change.	55	3.9	.	.	.	.
J06	Yes	Know what happens to atoms in animal after death.	15	2.4	.	.	.	.
J08	Yes	Identify gas involved in fire ignition.	42	4.6	.	.	.	.
M10	Yes	Identify substances which are mixtures.	28	4.5	.	.	.	.
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	23	3.3	.	.	.	.
N07	Yes	Explain oxygen fuel requirements of burning candle.	71	4.5	.	.	.	.
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	31	3.8	.	.	.	.
O11	Yes	Identify which change in elemental form is due to a chemical change.	39	3.2	.	.	.	.
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	31	3.8	.	.	.	.
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	42	3.9	.	.	.	.
Q15	Yes	Determine physical processes involving chemical change.	31	3.7	.	.	.	.
R05	Yes	Explain how carbon dioxide fire extinguishers work.	49	4.7	.	.	.	.
Z01A	Yes	Explain why steel bridges must be painted.	52	5.0	.	.	.	.
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	18	3.8	.	.	.	.
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	18	3.8	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Kuwait SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	24	1.1	.	.	.	.
B01	No	Identify hottest layer of the Earth.	71	1.9	.	.	.	.
B05	No	Use elevation/weather diagram to locate earth feature.	36	2.7	.	.	.	.
C07	No	Relate mountain shape to age.	18	1.3	.	.	.	.
D03	No	Identify direction of river flow on contour map.	21	1.8	.	.	.	.
E09	No	Use table of time/temperature to determine point when weather changes.	60	3.3	.	.	.	.
E12	No	Identify type of stone involved in cave formation.	22	1.9	.	.	.	.
F05	No	Relate level of oxygen to elevation.	69	1.8	.	.	.	.
G11	No	Identify type of rock from description of its formation.	55	1.9	.	.	.	.
H03	No	Select explanation for moonlight.	84	1.9	.	.	.	.
H04	No	Identify ground layer containing the most organic material.	47	2.8	.	.	.	.
I17	Yes	Know energy source for Earth’s water cycle.	36	3.1	.	.	.	.
J01	Yes	Know changes in Earth’s surface over billions of years.	15	2.4	.	.	.	.
K15	Yes	Know organic origins of fossil fuels.	55	2.8	.	.	.	.
O12	Yes	Know relative amounts of components in air.	37	4.2	.	.	.	.
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	47	4.7	.	.	.	.
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	61	3.8	.	.	.	.
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	50	2.9	.	.	.	.
Q16	Yes	Estimate time for light from star to reach Earth.	21	2.7	.	.	.	.
R04	Yes	Give reason why ozone layer is important for life.	65	4.4	.	.	.	.
W01A	Yes	Give reason region in land/water diagram is a good farming location.	59	4.5	.	.	.	.
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	20	2.8	.	.	.	.
W02	Yes	Draw diagram showing Earth’s water cycle.	25	2.5	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Kuwait SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	43	1.9	.	.	.	.
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	11	1.4	.	.	.	.
F04	No	Predict type of area where soil erosion by rain is most likely.	54	1.9	.	.	.	.
G12	No	Identify a nonrenewable natural resource.	52	2.6	.	.	.	.
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	18	2.5	.	.	.	.
I13	Yes	Select best scale for accurate measurement.	36	4.0	.	.	.	.
I15	Yes	Identify the type of scientific statement given in an experimental report.	30	3.0	.	.	.	.
I18	Yes	Write conclusion from summary of experimental observations.	28	4.8	.	.	.	.
K19	Yes	Write an example of how computers are used to do work.	60	3.4	.	.	.	.
N01	Yes	Determine correct control experiment to test hypothesis.	36	2.7	.	.	.	.
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	28	3.3	.	.	.	.
N05	Yes	Identify a principal cause of acid rain.	46	4.8	.	.	.	.
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	60	4.0	.	.	.	.
Z02A	Yes	Write a reason why not all people have enough water.	44	3.4	.	.	.	.
Z02B	Yes	Write a second reason why not all people have enough water.	44	3.4	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Kuwait SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	54	1.7	.	.	.	.
B04	No	Predict pulse/breathing rate change after exercise.	82	1.6	.	.	.	.
C08	No	Identify carrier of signals from eye to brain.	60	2.5	.	.	.	.
D05	No	Identify system carrying sensory messages to the brain.	62	2.5	.	.	.	.
D06	No	Relate plant part to seed development.	51	2.2	.	.	.	.
E08	No	Select correct statement of trait heredity from parents.	56	2.3	.	.	.	.
E10	No	Determine characteristics for classifying animals.	32	2.0	.	.	.	.
F01	No	Identify characteristic of mammal.	57	2.1	.	.	.	.
F03	No	Identify human organ which interprets senses.	36	2.1	.	.	.	.
G08	No	Identify main function of red blood cells.	42	2.0	.	.	.	.
G09	No	Identify reproductive cells involved in heredity.	77	2.2	.	.	.	.
H01	No	Identify the functions of blood.	61	2.4	.	.	.	.
H02	No	Identify the role of vitamins.	70	2.2	.	.	.	.
I10	Yes	Identify nutrition content of fruits and vegetables.	68	3.3	.	.	.	.
I11	Yes	Know identifying features of insects.	37	4.4	.	.	.	.
I14	Yes	Relate elbow action to a simple machine.	42	4.2	.	.	.	.
I19	Yes	Identify statement of oxygen production consistent with data.	17	2.8	.	.	.	.
J02	Yes	Choose species on Earth for shortest time.	60	3.2	.	.	.	.
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	42	4.6	.	.	.	.
J09	Yes	Explain how to determine the age of a cut tree.	31	4.7	.	.	.	.
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	51	3.3	.	.	.	.
K12	Yes	Relate reproductive cell production to population.	40	3.6	.	.	.	.
K16	Yes	Identify common product made with bacteria.	46	4.6	.	.	.	.
K18	Yes	Identify main function of chloroplasts in plant cell.	37	3.5	.	.	.	.
L02	Yes	Select reason why algae are close to ocean surface.	37	3.1	.	.	.	.
L03	Yes	Identify skull features typical of predators.	64	4.4	.	.	.	.
L05	Yes	Select most likely purpose for birds' singing.	68	3.1	.	.	.	.
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	34	3.1	.	.	.	.
M11	Yes	Complete a food web showing energy relationships.	46	3.6	.	.	.	.
N02	Yes	Choose meal which would give the most nutrients.	40	4.9	.	.	.	.
N04	Yes	Identify how decaying fish fertilize plants.	15	3.1	.	.	.	.
N06	Yes	Identify the most basic unit of living things.	72	3.5	.	.	.	.
O16	Yes	Give reason for thirst on a hot day.	47	3.7	.	.	.	.
O17	Yes	Describe how disease may be transmitted.	33	4.1	.	.	.	.
P04	Yes	Identify what happens to animals' biological processes during hibernation.	36	3.7	.	.	.	.
P06	Yes	Describe digestion occuring in the mouth.	29	5.3	.	.	.	.
Q17	Yes	Describe the advantage of having two eyes.	47	2.6	.	.	.	.
R03	Yes	Give example of consequences of introducing new species.	9	1.9	.	.	.	.
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	8	1.7	.	.	.	.
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	48	4.0	.	.	.	.
X02B	Yes	Explain why light is important in aquarium ecosystem.	22	2.8	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Kuwait SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	51	1.8	.	.	.	.
A10	No	Relate light level and reflectance to vision of object.	61	1.6	.	.	.	.
B02	No	Know type of energy released from combustion engine.	69	2.0	.	.	.	.
B03	No	Determine density from mass/volume table.	17	1.9	.	.	.	.
B06	No	Relate color of object to amount of light reflection.	70	1.9	.	.	.	.
C09	No	Identify correct position of reflected image.	73	2.2	.	.	.	.
C12	No	Identify substance which is NOT a fossil fuel.	59	2.3	.	.	.	.
D01	No	Identify correct diagram of light rays through lens.	27	1.8	.	.	.	.
D02	No	Identify substance from magnetic properties.	64	2.1	.	.	.	.
D04	No	Relate physical event to its sequence of energy changes.	67	2.5	.	.	.	.
E07	No	Identify particles found in the nucleus of atoms.	35	1.8	.	.	.	.
E11	No	Find shadow size from diagram of bulb/card/screen distances.	49	2.0	.	.	.	.
F02	No	Relate color and light reflection to temperature of object.	46	2.1	.	.	.	.
G07	No	Identify correct way to place batteries in a flashlight.	78	1.6	.	.	.	.
H05	No	Identify source of energy stored in food.	23	2.5	.	.	.	.
I16	Yes	Identify material with greatest heat conductivity.	56	4.3	.	.	.	.
K10	Yes	Describe a method demonstrating the existence of air.	22	3.3	.	.	.	.
K13	Yes	Identify electrical conductors that form complete circuits.	65	2.9	.	.	.	.
K14	Yes	Relate evaporation rate to surface area.	64	3.9	.	.	.	.
K17	Yes	Relate presence of gravitational force to position of falling object.	50	3.7	.	.	.	.
L01	Yes	Select diagram showing forces resulting in rotation.	30	2.8	.	.	.	.
L04	Yes	Explain most efficient engine.	19	3.6	.	.	.	.
L07	Yes	Relate sound transmission to air.	64	3.1	.	.	.	.
M12	Yes	Complete table of voltage/current data for circuit.	17	3.3	.	.	.	.
M14	Yes	Draw reflected image of object.	53	4.7	.	.	.	.
N08	Yes	Relate lever arm lengths to balanced weights.	40	3.6	.	.	.	.
N10	Yes	Determine effect of tipping container on water surface.	18	4.5	.	.	.	.
O10	Yes	Identify polarity of ends of cut magnet.	37	4.2	.	.	.	.
O13	Yes	Relate circular motion to centripetal force.	56	4.4	.	.	.	.
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	45	3.2	.	.	.	.
P02	Yes	Explain relationship between illuminance and distance of light source.	24	3.1	.	.	.	.
P05	Yes	Explain why balloon expands upon heating.	51	4.3	.	.	.	.
Q12	Yes	Explain how focusing affects the amount of light.	66	3.5	.	.	.	.
Q13	Yes	Compare heat expansion properties of metal and glass.	26	3.0	.	.	.	.
Q18	Yes	Explain effect of melting on the mass of ice cubes.	8	2.2	.	.	.	.
R01	Yes	Choose diagram showing angle of reflected light.	79	2.7	.	.	.	.
R02	Yes	Identify reflection/absorption properties from color.	35	3.5	.	.	.	.
Y01	Yes	Explain amount of light/electric energy in a lamp.	8	1.8	.	.	.	.
Y02	Yes	Explain temperature of melting snowball.	7	1.7	.	.	.	.

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Latvia (LSS) SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	72	1.4	78	1.4	67	1.9
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	81	1.5	76	2.2	85	1.8
F06	No	Relate rusting iron to the presence of oxygen and moisture.	62	1.8	66	2.4	59	2.3
G10	No	Select correct statement regarding the atomic makeup of matter.	61	2.1	64	2.6	57	2.7
H06	No	Know if wood-burning reaction absorbs or releases energy.	32	2.0	38	2.4	27	2.8
J03	Yes	Know relationship between molecules, atoms and cells.	38	2.9	39	4.0	37	3.5
J04	Yes	Distiguish between a chemical reaction and a physical change.	48	3.3	46	5.0	49	4.2
J06	Yes	Know what happens to atoms in animal after death.	21	2.5	20	3.4	23	3.3
J08	Yes	Identify gas involved in fire ignition.	61	3.2	63	4.9	60	4.2
M10	Yes	Identify substances which are mixtures.	41	3.2	47	4.2	35	4.6
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	34	2.9	39	4.2	28	3.9
N07	Yes	Explain oxygen fuel requirements of burning candle.	86	2.8	86	3.4	85	3.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	51	2.8	56	4.5	44	3.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	38	3.2	42	3.8	34	4.1
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	39	3.0	37	4.6	40	4.0
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	60	3.2	60	4.6	60	4.2
Q15	Yes	Determine physical processes involving chemical change.	26	3.0	22	4.0	29	3.9
R05	Yes	Explain how carbon dioxide fire extinguishers work.	42	3.0	51	4.2	35	3.6
Z01A	Yes	Explain why steel bridges must be painted.	72	2.9	72	3.6	72	4.2
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	33	2.7	32	3.4	35	4.6
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	5	1.2	5	2.1	5	1.9

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Latvia (LSS) SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	62	1.4	64	1.7	60	1.7
B01	No	Identify hottest layer of the Earth.	83	1.4	84	1.8	82	2.0
B05	No	Use elevation/weather diagram to locate earth feature.	52	1.8	50	2.6	53	2.1
C07	No	Relate mountain shape to age.	38	2.3	44	3.0	31	2.8
D03	No	Identify direction of river flow on contour map.	29	1.8	35	2.4	24	2.2
E09	No	Use table of time/temperature to determine point when weather changes.	67	2.0	67	2.7	67	2.5
F05	No	Relate level of oxygen to elevation.	65	1.8	70	2.6	62	2.8
G11	No	Identify type of rock from description of its formation.	78	1.5	74	2.3	82	1.8
H03	No	Select explanation for moonlight.	77	1.9	82	2.5	72	2.1
H04	No	Identify ground layer containing the most organic material.	64	2.0	69	3.0	59	2.5
I17	Yes	Know energy source for Earth’s water cycle.	16	2.6	16	3.2	17	4.0
J01	Yes	Know changes in Earth’s surface over billions of years.	27	2.8	26	3.9	27	3.6
K15	Yes	Know organic origins of fossil fuels.	46	3.6	49	4.0	43	4.3
O12	Yes	Know relative amounts of components in air.	18	2.6	20	3.8	15	3.1
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	51	3.4	61	4.6	42	4.7
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	73	2.6	76	3.8	69	4.0
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	36	3.4	34	5.0	38	4.0
Q16	Yes	Estimate time for light from star to reach Earth.	23	3.2	28	4.3	19	3.8
R04	Yes	Give reason why ozone layer is important for life.	36	3.4	41	4.3	31	4.0
W01A	Yes	Give reason region in land/water diagram is a good farming location.	71	2.2	74	2.7	68	3.1
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	30	2.1	33	2.7	27	2.9
W02	Yes	Draw diagram showing Earth’s water cycle.	19	2.0	22	2.5	17	2.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Latvia (LSS) SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	54	1.5	54	2.1	54	1.8
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	37	1.7	43	2.8	32	2.3
F04	No	Predict type of area where soil erosion by rain is most likely.	78	1.5	77	2.4	80	2.1
G12	No	Identify a nonrenewable natural resource.	32	2.0	35	2.6	30	2.8
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	41	3.0	39	3.9	43	4.5
I13	Yes	Select best scale for accurate measurement.	68	2.9	69	4.2	67	4.1
I15	Yes	Identify the type of scientific statement given in an experimental report.	50	3.6	49	4.7	51	5.1
I18	Yes	Write conclusion from summary of experimental observations.	35	2.8	36	3.9	34	4.4
K19	Yes	Write an example of how computers are used to do work.	56	3.5	63	4.8	49	4.3
N01	Yes	Determine correct control experiment to test hypothesis.	45	3.3	41	4.3	49	4.4
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	69	3.0	74	4.3	64	3.5
N05	Yes	Identify a principal cause of acid rain.	25	2.8	27	3.9	22	3.4
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	49	3.4	49	4.2	49	4.7
Z02A	Yes	Write a reason why not all people have enough water.	45	3.1	46	4.3	44	4.0
Z02B	Yes	Write a second reason why not all people have enough water.	17	2.1	17	3.0	17	2.9

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Latvia (LSS) SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	76	1.2	74	1.5	78	1.6
B04	No	Predict pulse/breathing rate change after exercise.	89	1.0	91	1.3	87	1.4
C08	No	Identify carrier of signals from eye to brain.	72	1.9	71	2.7	73	2.3
D05	No	Identify system carrying sensory messages to the brain.	77	1.5	78	2.1	76	2.1
D06	No	Relate plant part to seed development.	90	1.2	88	2.0	92	1.4
E08	No	Select correct statement of trait heredity from parents.	81	1.6	76	2.3	86	1.9
E10	No	Determine characteristics for classifying animals.	52	2.0	49	3.0	54	2.3
F01	No	Identify characteristic of mammal.	78	1.6	76	2.1	79	2.2
F03	No	Identify human organ which interprets senses.	57	1.8	61	2.3	53	2.6
G08	No	Identify main function of red blood cells.	45	2.1	48	2.6	42	2.7
G09	No	Identify reproductive cells involved in heredity.	70	1.9	69	2.7	71	2.5
H01	No	Identify the functions of blood.	51	2.0	53	2.6	50	2.8
H02	No	Identify the role of vitamins.	91	1.1	91	1.4	92	1.4
I10	Yes	Identify nutrition content of fruits and vegetables.	87	2.1	84	3.1	89	2.9
I11	Yes	Know identifying features of insects.	44	2.8	45	4.2	43	4.4
I14	Yes	Relate elbow action to a simple machine.	34	3.1	38	3.9	30	4.3
I19	Yes	Identify statement of oxygen production consistent with data.	51	3.3	49	4.6	54	4.4
J02	Yes	Choose species on Earth for shortest time.	30	2.9	33	4.3	29	3.8
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	47	3.3	46	5.0	47	4.2
J09	Yes	Explain how to determine the age of a cut tree.	87	2.2	88	3.5	86	2.8
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	50	3.3	51	4.6	50	4.6
K12	Yes	Relate reproductive cell production to population.	40	3.3	47	4.7	34	4.6
K16	Yes	Identify common product made with bacteria.	35	3.3	38	4.2	32	3.9
K18	Yes	Identify main function of chloroplasts in plant cell.	39	3.4	44	4.7	35	3.9
L02	Yes	Select reason why algae are close to ocean surface.	42	3.5	45	4.5	40	4.9
L03	Yes	Identify skull features typical of predators.	71	3.0	76	4.4	66	3.9
L05	Yes	Select most likely purpose for birds' singing.	60	3.2	57	5.2	63	3.8
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	72	3.0	67	3.9	75	3.6
M11	Yes	Complete a food web showing energy relationships.	75	2.7	77	3.2	72	4.3
N02	Yes	Choose meal which would give the most nutrients.	29	2.7	27	3.5	31	4.2
N04	Yes	Identify how decaying fish fertilize plants.	67	2.9	70	3.9	65	4.5
N06	Yes	Identify the most basic unit of living things.	41	3.6	41	4.6	42	4.9
O16	Yes	Give reason for thirst on a hot day.	33	2.9	38	4.3	29	4.0
O17	Yes	Describe how disease may be transmitted.	37	3.0	39	4.4	34	3.7
P04	Yes	Identify what happens to animals' biological processes during hibernation.	43	3.0	48	4.7	38	3.5
P06	Yes	Describe digestion occuring in the mouth.	32	3.3	35	4.6	30	4.1
Q17	Yes	Describe the advantage of having two eyes.	50	2.8	56	4.3	46	4.2
R03	Yes	Give example of consequences of introducing new species.	7	1.8	5	1.7	8	2.9
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	3	0.6	3	0.8	3	0.9
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	53	2.6	52	3.3	55	3.3
X02B	Yes	Explain why light is important in aquarium ecosystem.	13	1.3	15	2.3	11	1.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Latvia (LSS) SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	47	1.4	46	2.1	48	1.9
A10	No	Relate light level and reflectance to vision of object.	68	1.3	72	1.5	65	1.7
B02	No	Know type of energy released from combustion engine.	55	1.7	52	2.4	58	2.4
B03	No	Determine density from mass/volume table.	34	1.7	37	2.2	30	2.5
B06	No	Relate color of object to amount of light reflection.	82	1.5	81	1.7	83	2.0
C09	No	Identify correct position of reflected image.	71	1.8	76	2.3	66	2.3
C12	No	Identify substance which is NOT a fossil fuel.	55	2.2	58	2.7	54	2.7
D01	No	Identify correct diagram of light rays through lens.	38	1.8	43	2.8	33	2.6
D02	No	Identify substance from magnetic properties.	67	1.8	74	2.2	62	2.3
D04	No	Relate physical event to its sequence of energy changes.	51	1.8	58	2.6	46	2.7
E07	No	Identify particles found in the nucleus of atoms.	31	2.3	29	2.8	33	2.9
E11	No	Find shadow size from diagram of bulb/card/screen distances.	60	2.0	62	2.6	57	2.6
F02	No	Relate color and light reflection to temperature of object.	71	1.9	76	2.4	68	2.6
G07	No	Identify correct way to place batteries in a flashlight.	89	1.2	93	1.0	84	2.1
H05	No	Identify source of energy stored in food.	17	1.5	18	2.0	17	2.3
I16	Yes	Identify material with greatest heat conductivity.	92	2.0	91	2.5	92	3.2
J05	Yes	Identify type of solar radiation that causes sunburn.	58	2.8	62	4.7	55	3.8
K10	Yes	Describe a method demonstrating the existence of air.	22	2.5	26	3.6	18	3.0
K13	Yes	Identify electrical conductors that form complete circuits.	60	3.5	80	3.8	44	4.7
K14	Yes	Relate evaporation rate to surface area.	81	2.5	80	3.7	83	3.0
K17	Yes	Relate presence of gravitational force to position of falling object.	41	3.3	38	4.7	43	4.5
L01	Yes	Select diagram showing forces resulting in rotation.	48	3.0	55	4.6	43	3.7
L04	Yes	Explain most efficient engine.	18	2.5	23	4.2	15	3.1
L07	Yes	Relate sound transmission to air.	80	2.9	81	3.9	79	3.7
M12	Yes	Complete table of voltage/current data for circuit.	44	3.2	49	4.8	38	4.0
M14	Yes	Draw reflected image of object.	76	2.7	78	4.2	73	3.5
N08	Yes	Relate lever arm lengths to balanced weights.	68	3.3	74	3.9	62	4.8
N10	Yes	Determine effect of tipping container on water surface.	54	3.1	68	4.0	40	4.8
O10	Yes	Identify polarity of ends of cut magnet.	31	2.8	37	4.2	25	4.0
O13	Yes	Relate circular motion to centripetal force.	61	3.4	67	4.8	56	4.3
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	82	2.6	82	3.3	81	3.2
P02	Yes	Explain relationship between illuminance and distance of light source.	20	2.4	23	3.8	18	2.7
P05	Yes	Explain why balloon expands upon heating.	56	3.0	67	4.9	46	4.7
Q12	Yes	Explain how focusing affects the amount of light.	41	2.7	50	4.6	34	3.9
Q13	Yes	Compare heat expansion properties of metal and glass.	62	3.0	60	4.8	63	4.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	23	2.7	29	4.0	18	3.1
R01	Yes	Choose diagram showing angle of reflected light.	73	2.4	77	3.5	69	3.9
R02	Yes	Identify reflection/absorption properties from color.	32	3.1	33	3.8	30	4.6
Y01	Yes	Explain amount of light/electric energy in a lamp.	5	1.0	6	1.6	3	1.0
Y02	Yes	Explain temperature of melting snowball.	12	1.8	12	2.6	12	2.1

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Lithuania SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	64	1.5	64	2.0	64	2.0
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	91	1.1	90	1.6	91	1.5
F06	No	Relate rusting iron to the presence of oxygen and moisture.	76	1.9	80	2.3	72	2.5
G10	No	Select correct statement regarding the atomic makeup of matter.	63	1.8	67	2.1	60	2.6
H06	No	Know if wood-burning reaction absorbs or releases energy.	48	2.5	55	3.1	43	3.0
J03	Yes	Know relationship between molecules, atoms and cells.	39	2.9	38	4.2	40	3.9
J04	Yes	Distiguish between a chemical reaction and a physical change.	61	3.4	61	4.3	61	4.5
J06	Yes	Know what happens to atoms in animal after death.	15	2.4	20	3.3	11	2.9
J08	Yes	Identify gas involved in fire ignition.	40	2.9	40	3.8	40	4.1
M10	Yes	Identify substances which are mixtures.	33	2.6	28	3.8	38	3.6
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	42	3.3	44	5.0	40	4.0
N07	Yes	Explain oxygen fuel requirements of burning candle.	95	1.7	94	2.6	95	2.0
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	65	3.1	70	3.7	59	4.9
O11	Yes	Identify which change in elemental form is due to a chemical change.	16	2.1	15	3.2	17	3.4
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	65	3.4	66	4.1	65	4.7
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	46	3.7	49	4.9	44	4.8
Q15	Yes	Determine physical processes involving chemical change.	37	3.4	40	4.8	35	4.3
R05	Yes	Explain how carbon dioxide fire extinguishers work.	29	3.2	39	4.9	22	3.4
Z01A	Yes	Explain why steel bridges must be painted.	42	3.2	52	4.8	32	4.3
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	26	2.9	31	4.0	22	3.8
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	7	1.6	10	2.5	5	1.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Lithuania SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	46	1.5	52	1.9	41	1.9
B01	No	Identify hottest layer of the Earth.	84	1.5	89	1.7	80	2.2
B05	No	Use elevation/weather diagram to locate earth feature.	47	2.0	51	2.9	43	2.6
C07	No	Relate mountain shape to age.	41	2.6	47	3.1	35	3.4
D03	No	Identify direction of river flow on contour map.	39	2.3	44	3.0	35	2.7
E09	No	Use table of time/temperature to determine point when weather changes.	62	2.2	60	2.6	63	2.8
E12	No	Identify type of stone involved in cave formation.	38	2.2	38	3.1	38	2.4
F05	No	Relate level of oxygen to elevation.	75	1.6	75	2.1	75	2.1
G11	No	Identify type of rock from description of its formation.	83	1.5	80	2.5	86	1.7
H03	No	Select explanation for moonlight.	62	2.4	65	3.1	59	3.4
H04	No	Identify ground layer containing the most organic material.	62	2.3	66	3.1	58	3.2
I17	Yes	Know energy source for Earth’s water cycle.	26	2.5	27	4.3	25	3.2
J01	Yes	Know changes in Earth’s surface over billions of years.	35	2.9	32	3.7	37	4.3
K15	Yes	Know organic origins of fossil fuels.	34	3.4	39	4.1	29	4.4
O12	Yes	Know relative amounts of components in air.	22	2.7	24	3.7	21	3.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	52	3.6	63	4.6	45	4.8
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	63	3.2	66	4.4	61	4.0
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	43	3.5	46	4.7	41	4.5
Q16	Yes	Estimate time for light from star to reach Earth.	16	2.5	20	3.9	14	3.1
R04	Yes	Give reason why ozone layer is important for life.	38	3.6	49	5.1	31	4.4
W01A	Yes	Give reason region in land/water diagram is a good farming location.	68	1.9	71	3.3	66	2.7
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	39	2.4	39	3.5	38	3.2
W02	Yes	Draw diagram showing Earth’s water cycle.	9	1.4	9	2.0	9	1.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Lithuania SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	46	1.8	47	2.2	44	2.2
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	20	1.7	23	2.1	17	2.4
F04	No	Predict type of area where soil erosion by rain is most likely.	59	1.8	65	2.7	53	2.4
G12	No	Identify a nonrenewable natural resource.	41	1.9	45	2.6	36	2.5
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	30	3.2	31	4.5	30	4.3
I13	Yes	Select best scale for accurate measurement.	65	3.1	67	4.2	64	4.2
I15	Yes	Identify the type of scientific statement given in an experimental report.	40	3.3	34	4.5	45	4.5
I18	Yes	Write conclusion from summary of experimental observations.	23	2.9	23	4.1	23	3.9
K19	Yes	Write an example of how computers are used to do work.	55	3.1	57	4.0	53	4.2
N01	Yes	Determine correct control experiment to test hypothesis.	26	3.1	28	4.2	25	4.2
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	58	3.4	63	4.0	53	5.1
N05	Yes	Identify a principal cause of acid rain.	23	2.8	25	3.8	22	3.7
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	50	3.1	42	5.2	55	4.0
Z02A	Yes	Write a reason why not all people have enough water.	38	2.8	45	4.4	31	3.8
Z02B	Yes	Write a second reason why not all people have enough water.	23	3.2	21	3.5	25	5.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Lithuania SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	73	1.7	72	2.0	75	2.0
B04	No	Predict pulse/breathing rate change after exercise.	91	1.0	92	1.3	89	1.2
C08	No	Identify carrier of signals from eye to brain.	61	2.3	61	2.5	62	3.0
D05	No	Identify system carrying sensory messages to the brain.	70	2.0	72	2.4	69	2.7
D06	No	Relate plant part to seed development.	91	1.1	89	1.7	92	1.4
E08	No	Select correct statement of trait heredity from parents.	75	1.9	69	2.9	80	2.3
E10	No	Determine characteristics for classifying animals.	38	1.9	36	2.7	39	2.4
F01	No	Identify characteristic of mammal.	74	1.6	71	2.5	76	2.3
F03	No	Identify human organ which interprets senses.	75	2.0	77	2.2	73	2.6
G08	No	Identify main function of red blood cells.	47	2.2	48	3.1	45	3.0
G09	No	Identify reproductive cells involved in heredity.	57	2.5	50	2.8	62	3.2
H01	No	Identify the functions of blood.	59	2.0	59	2.8	59	2.9
H02	No	Identify the role of vitamins.	81	1.5	79	2.2	82	1.9
I10	Yes	Identify nutrition content of fruits and vegetables.	76	2.8	77	3.8	75	3.8
I11	Yes	Know identifying features of insects.	41	3.3	43	4.8	40	3.4
I14	Yes	Relate elbow action to a simple machine.	44	3.5	51	3.9	39	4.7
I19	Yes	Identify statement of oxygen production consistent with data.	44	3.1	39	4.2	49	4.4
J02	Yes	Choose species on Earth for shortest time.	80	2.5	75	3.4	84	3.4
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	38	2.7	41	4.0	34	3.7
J09	Yes	Explain how to determine the age of a cut tree.	85	2.5	85	3.3	85	3.6
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	44	3.5	46	4.7	43	4.7
K12	Yes	Relate reproductive cell production to population.	54	2.9	56	3.7	51	4.1
K16	Yes	Identify common product made with bacteria.	20	2.3	23	3.3	16	3.2
K18	Yes	Identify main function of chloroplasts in plant cell.	66	2.8	66	4.0	66	3.9
L02	Yes	Select reason why algae are close to ocean surface.	40	3.2	37	5.2	42	4.2
L03	Yes	Identify skull features typical of predators.	63	3.3	69	5.1	58	4.3
L05	Yes	Select most likely purpose for birds' singing.	61	2.8	66	3.9	56	4.1
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	68	3.0	67	4.1	69	4.2
M11	Yes	Complete a food web showing energy relationships.	56	3.2	54	4.6	59	4.3
N02	Yes	Choose meal which would give the most nutrients.	29	2.7	27	3.5	30	4.5
N04	Yes	Identify how decaying fish fertilize plants.	48	3.1	57	4.0	38	4.4
N06	Yes	Identify the most basic unit of living things.	55	3.3	53	4.4	57	4.7
O16	Yes	Give reason for thirst on a hot day.	28	2.9	26	4.1	29	4.0
O17	Yes	Describe how disease may be transmitted.	55	3.2	48	5.0	60	4.3
P04	Yes	Identify what happens to animals' biological processes during hibernation.	49	3.5	53	5.1	47	3.7
P06	Yes	Describe digestion occuring in the mouth.	17	2.8	16	3.5	18	3.7
Q17	Yes	Describe the advantage of having two eyes.	45	3.2	49	3.9	43	4.3
R03	Yes	Give example of consequences of introducing new species.	6	1.5	9	2.2	4	1.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	5	0.9	3	0.8	7	1.3
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	57	2.9	54	3.6	60	3.8
X02B	Yes	Explain why light is important in aquarium ecosystem.	38	2.6	36	3.0	40	4.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Lithuania SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	60	1.9	57	2.4	62	2.1
A10	No	Relate light level and reflectance to vision of object.	64	1.4	64	1.9	65	1.8
B02	No	Know type of energy released from combustion engine.	43	2.2	41	2.7	45	2.5
B03	No	Determine density from mass/volume table.	31	2.0	32	2.5	30	2.5
B06	No	Relate color of object to amount of light reflection.	80	1.3	84	1.6	77	1.9
C09	No	Identify correct position of reflected image.	61	1.7	69	2.5	55	2.5
C12	No	Identify substance which is NOT a fossil fuel.	83	1.5	83	2.0	83	1.8
D01	No	Identify correct diagram of light rays through lens.	55	2.2	71	2.5	42	2.9
D02	No	Identify substance from magnetic properties.	81	1.5	86	2.0	77	2.2
D04	No	Relate physical event to its sequence of energy changes.	40	2.0	46	2.9	35	2.5
E07	No	Identify particles found in the nucleus of atoms.	62	2.2	59	3.1	65	2.7
E11	No	Find shadow size from diagram of bulb/card/screen distances.	53	2.0	54	3.0	52	2.6
F02	No	Relate color and light reflection to temperature of object.	59	2.1	70	2.7	48	2.7
G07	No	Identify correct way to place batteries in a flashlight.	88	1.2	97	0.8	80	2.1
H05	No	Identify source of energy stored in food.	12	1.3	10	1.9	14	2.0
I16	Yes	Identify material with greatest heat conductivity.	83	2.4	87	3.0	81	3.2
J05	Yes	Identify type of solar radiation that causes sunburn.	60	3.2	62	4.6	58	4.2
K10	Yes	Describe a method demonstrating the existence of air.	16	2.3	20	3.0	13	3.1
K13	Yes	Identify electrical conductors that form complete circuits.	64	3.0	84	3.3	47	4.2
K14	Yes	Relate evaporation rate to surface area.	83	2.2	85	3.1	82	2.7
K17	Yes	Relate presence of gravitational force to position of falling object.	61	3.1	64	4.5	58	4.4
L01	Yes	Select diagram showing forces resulting in rotation.	49	3.5	57	5.5	41	4.2
L04	Yes	Explain most efficient engine.	13	2.1	14	3.4	12	3.1
L07	Yes	Relate sound transmission to air.	64	2.9	64	5.3	63	4.2
M12	Yes	Complete table of voltage/current data for circuit.	44	3.2	56	4.8	33	4.1
M14	Yes	Draw reflected image of object.	76	2.7	80	4.0	73	3.6
N08	Yes	Relate lever arm lengths to balanced weights.	84	2.4	90	2.4	78	4.0
N10	Yes	Determine effect of tipping container on water surface.	47	3.1	59	4.5	36	3.8
O10	Yes	Identify polarity of ends of cut magnet.	50	3.2	58	4.9	44	4.0
O13	Yes	Relate circular motion to centripetal force.	60	3.0	70	4.4	53	4.3
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	77	2.9	84	3.3	73	4.2
P02	Yes	Explain relationship between illuminance and distance of light source.	13	2.5	17	3.7	11	3.0
P05	Yes	Explain why balloon expands upon heating.	61	3.1	67	4.8	57	3.8
Q12	Yes	Explain how focusing affects the amount of light.	31	2.9	40	4.9	24	3.4
Q13	Yes	Compare heat expansion properties of metal and glass.	66	3.1	62	5.2	68	4.2
Q18	Yes	Explain effect of melting on the mass of ice cubes.	19	2.8	22	4.0	17	3.2
R01	Yes	Choose diagram showing angle of reflected light.	58	3.5	61	4.9	56	4.5
R02	Yes	Identify reflection/absorption properties from color.	24	2.6	24	3.9	24	3.2
Y01	Yes	Explain amount of light/electric energy in a lamp.	3	1.2	5	2.3	2	1.0
Y02	Yes	Explain temperature of melting snowball.	8	1.3	7	1.6	9	2.1

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Netherlands SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	85	1.2	88	1.6	82	1.4
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	89	1.2	92	1.5	86	1.9
F06	No	Relate rusting iron to the presence of oxygen and moisture.	79	2.2	78	2.9	81	2.3
G10	No	Select correct statement regarding the atomic makeup of matter.	48	2.1	54	2.8	42	3.2
H06	No	Know if wood-burning reaction absorbs or releases energy.	57	3.1	64	2.9	50	4.4
J03	Yes	Know relationship between molecules, atoms and cells.	24	3.1	28	4.6	19	4.4
J04	Yes	Distiguish between a chemical reaction and a physical change.	51	3.6	56	4.4	46	5.8
J06	Yes	Know what happens to atoms in animal after death.	25	3.0	31	4.9	18	3.6
J08	Yes	Identify gas involved in fire ignition.	36	3.5	42	5.5	28	4.2
M10	Yes	Identify substances which are mixtures.	50	3.6	50	6.3	49	5.2
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	25	3.0	30	4.6	20	4.2
N07	Yes	Explain oxygen fuel requirements of burning candle.	96	1.3	96	1.8	96	1.9
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	60	3.0	56	4.6	65	4.7
O11	Yes	Identify which change in elemental form is due to a chemical change.	42	4.6	40	5.2	43	6.1
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	21	3.2	26	5.1	16	3.6
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	21	3.1	19	3.9	23	4.8
Q15	Yes	Determine physical processes involving chemical change.	35	3.7	41	5.4	31	4.6
R05	Yes	Explain how carbon dioxide fire extinguishers work.	56	3.3	66	5.4	48	4.3
Z01A	Yes	Explain why steel bridges must be painted.	83	2.8	90	3.0	77	4.1
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	70	3.4	74	4.5	66	4.8
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	46	3.8	46	4.1	47	5.2

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Netherlands SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	71	2.3	71	2.9	70	2.3
B01	No	Identify hottest layer of the Earth.	92	1.2	96	1.1	88	2.2
B05	No	Use elevation/weather diagram to locate earth feature.	62	2.2	66	3.0	60	2.8
C07	No	Relate mountain shape to age.	35	2.2	40	3.0	29	2.7
D03	No	Identify direction of river flow on contour map.	44	2.4	52	3.4	36	3.3
E09	No	Use table of time/temperature to determine point when weather changes.	85	3.9	88	3.2	82	5.1
E12	No	Identify type of stone involved in cave formation.	54	2.1	55	3.1	53	2.8
F05	No	Relate level of oxygen to elevation.	88	1.4	86	2.3	90	1.6
G11	No	Identify type of rock from description of its formation.	43	3.0	46	3.8	40	3.5
H03	No	Select explanation for moonlight.	91	2.6	93	2.9	89	2.5
H04	No	Identify ground layer containing the most organic material.	48	2.9	53	3.1	43	3.5
I17	Yes	Know energy source for Earth’s water cycle.	35	3.7	41	5.2	28	4.1
J01	Yes	Know changes in Earth’s surface over billions of years.	48	3.4	43	5.2	54	4.8
K15	Yes	Know organic origins of fossil fuels.	71	3.7	77	4.5	65	4.5
O12	Yes	Know relative amounts of components in air.	31	3.1	42	5.2	20	3.9
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	65	3.4	71	5.6	60	6.4
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	88	4.3	87	5.1	88	4.6
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	62	3.5	67	4.6	56	4.7
Q16	Yes	Estimate time for light from star to reach Earth.	31	3.6	32	4.4	29	4.6
R04	Yes	Give reason why ozone layer is important for life.	57	4.1	61	4.8	54	5.6
W01A	Yes	Give reason region in land/water diagram is a good farming location.	78	2.3	78	2.9	78	3.4
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	54	2.5	51	3.9	57	4.1
W02	Yes	Draw diagram showing Earth’s water cycle.	57	2.7	64	4.2	49	3.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Netherlands SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	76	2.0	77	2.9	74	2.2
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	66	2.3	71	3.3	61	2.9
F04	No	Predict type of area where soil erosion by rain is most likely.	79	1.8	81	2.5	77	2.7
G12	No	Identify a nonrenewable natural resource.	55	2.3	62	2.8	47	2.9
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	52	3.3	59	4.7	44	5.7
I13	Yes	Select best scale for accurate measurement.	72	3.9	74	5.2	70	4.6
I15	Yes	Identify the type of scientific statement given in an experimental report.	58	5.0	56	5.8	59	6.0
I18	Yes	Write conclusion from summary of experimental observations.	52	4.3	46	4.9	58	5.4
K19	Yes	Write an example of how computers are used to do work.	86	2.5	84	4.4	89	3.3
N01	Yes	Determine correct control experiment to test hypothesis.	71	2.9	73	4.4	69	3.9
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	77	3.0	79	3.9	75	4.6
N05	Yes	Identify a principal cause of acid rain.	44	3.0	39	4.7	49	5.6
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	58	4.2	53	5.1	61	5.6
Z02A	Yes	Write a reason why not all people have enough water.	81	3.4	77	5.1	84	4.1
Z02B	Yes	Write a second reason why not all people have enough water.	55	4.4	53	5.7	56	4.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Netherlands SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	82	1.7	80	3.1	84	1.3
B04	No	Predict pulse/breathing rate change after exercise.	95	1.0	94	1.3	95	1.2
C08	No	Identify carrier of signals from eye to brain.	91	1.1	91	1.5	90	1.5
D05	No	Identify system carrying sensory messages to the brain.	83	1.8	86	2.0	79	3.0
D06	No	Relate plant part to seed development.	74	2.3	78	2.8	69	2.6
E08	No	Select correct statement of trait heredity from parents.	92	1.4	89	1.7	95	1.7
E10	No	Determine characteristics for classifying animals.	68	2.7	71	3.1	65	3.5
F01	No	Identify characteristic of mammal.	71	1.6	73	2.6	71	2.5
F03	No	Identify human organ which interprets senses.	81	1.9	83	2.2	79	3.5
G08	No	Identify main function of red blood cells.	71	1.9	74	2.2	68	2.5
G09	No	Identify reproductive cells involved in heredity.	77	1.9	74	3.6	80	2.3
H01	No	Identify the functions of blood.	74	1.7	73	2.8	74	2.1
H02	No	Identify the role of vitamins.	89	2.0	91	1.8	88	2.9
I10	Yes	Identify nutrition content of fruits and vegetables.	85	3.2	79	5.6	90	3.3
I11	Yes	Know identifying features of insects.	53	4.5	58	5.5	49	5.1
I14	Yes	Relate elbow action to a simple machine.	64	4.1	63	5.2	67	5.1
I19	Yes	Identify statement of oxygen production consistent with data.	56	4.4	58	5.5	53	5.2
J02	Yes	Choose species on Earth for shortest time.	67	3.6	66	5.3	67	4.9
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	53	3.2	50	4.5	57	4.7
J09	Yes	Explain how to determine the age of a cut tree.	95	1.3	96	1.8	94	2.0
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	57	3.9	59	5.1	54	4.9
K12	Yes	Relate reproductive cell production to population.	65	2.7	65	4.8	65	5.2
K16	Yes	Identify common product made with bacteria.	47	4.0	51	5.1	42	6.2
K18	Yes	Identify main function of chloroplasts in plant cell.	72	3.6	68	5.6	75	3.9
L02	Yes	Select reason why algae are close to ocean surface.	49	3.1	57	4.0	40	5.3
L03	Yes	Identify skull features typical of predators.	69	3.5	73	4.6	67	5.1
L05	Yes	Select most likely purpose for birds' singing.	63	3.6	69	4.3	59	5.9
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	63	3.6	68	3.3	56	6.4
M11	Yes	Complete a food web showing energy relationships.	74	2.6	76	4.6	72	3.4
N02	Yes	Choose meal which would give the most nutrients.	58	3.1	61	5.3	56	3.7
N04	Yes	Identify how decaying fish fertilize plants.	53	3.8	48	5.6	58	4.3
N06	Yes	Identify the most basic unit of living things.	85	3.0	90	2.8	80	5.0
O16	Yes	Give reason for thirst on a hot day.	67	3.8	73	5.1	61	4.7
O17	Yes	Describe how disease may be transmitted.	59	4.2	57	5.6	60	5.7
P04	Yes	Identify what happens to animals' biological processes during hibernation.	72	2.9	80	3.8	66	4.6
P06	Yes	Describe digestion occuring in the mouth.	42	3.8	38	5.6	45	4.7
Q17	Yes	Describe the advantage of having two eyes.	87	2.6	91	3.2	85	4.3
R03	Yes	Give example of consequences of introducing new species.	12	1.7	12	2.9	12	2.6
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	25	3.1	20	2.8	30	4.5
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	70	2.3	71	3.1	69	3.5
X02B	Yes	Explain why light is important in aquarium ecosystem.	27	3.0	29	3.7	25	4.1

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Netherlands SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	79	0.9	79	1.4	79	1.6
A10	No	Relate light level and reflectance to vision of object.	75	1.8	74	2.8	75	1.8
B02	No	Know type of energy released from combustion engine.	59	1.6	62	2.1	57	2.3
B03	No	Determine density from mass/volume table.	37	2.0	42	3.4	31	2.1
B06	No	Relate color of object to amount of light reflection.	93	0.9	94	1.4	92	1.4
C09	No	Identify correct position of reflected image.	87	2.4	87	2.7	87	2.8
C12	No	Identify substance which is NOT a fossil fuel.	71	2.0	70	2.5	71	3.0
D01	No	Identify correct diagram of light rays through lens.	48	2.2	58	3.2	38	3.2
D02	No	Identify substance from magnetic properties.	82	1.4	86	1.8	78	2.4
D04	No	Relate physical event to its sequence of energy changes.	69	2.5	74	2.5	63	3.2
E07	No	Identify particles found in the nucleus of atoms.	32	2.2	35	3.2	31	3.1
E11	No	Find shadow size from diagram of bulb/card/screen distances.	58	2.8	61	3.0	55	3.6
F02	No	Relate color and light reflection to temperature of object.	87	1.6	89	1.9	84	2.3
G07	No	Identify correct way to place batteries in a flashlight.	89	1.2	89	1.6	88	2.1
H05	No	Identify source of energy stored in food.	21	2.2	22	2.5	19	3.2
I16	Yes	Identify material with greatest heat conductivity.	88	2.5	84	4.8	92	3.0
J05	Yes	Identify type of solar radiation that causes sunburn.	80	3.0	81	3.6	79	4.5
K10	Yes	Describe a method demonstrating the existence of air.	45	2.9	42	4.6	46	4.8
K13	Yes	Identify electrical conductors that form complete circuits.	81	4.1	85	4.9	77	4.6
K14	Yes	Relate evaporation rate to surface area.	87	1.9	85	3.5	89	2.9
K17	Yes	Relate presence of gravitational force to position of falling object.	58	2.9	64	4.5	52	4.8
L01	Yes	Select diagram showing forces resulting in rotation.	60	3.6	66	4.0	55	5.5
L04	Yes	Explain most efficient engine.	58	4.2	66	4.5	50	6.1
L07	Yes	Relate sound transmission to air.	58	3.4	76	4.2	42	4.7
M12	Yes	Complete table of voltage/current data for circuit.	76	3.0	79	4.3	73	4.5
M14	Yes	Draw reflected image of object.	78	4.5	74	7.6	82	3.9
N08	Yes	Relate lever arm lengths to balanced weights.	78	3.4	82	4.0	75	4.6
N10	Yes	Determine effect of tipping container on water surface.	65	3.3	77	4.0	54	4.8
O10	Yes	Identify polarity of ends of cut magnet.	66	2.7	66	4.9	67	4.5
O13	Yes	Relate circular motion to centripetal force.	69	3.4	74	4.7	66	5.1
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	95	1.7	96	1.8	94	2.5
P02	Yes	Explain relationship between illuminance and distance of light source.	30	3.8	35	5.7	27	5.0
P05	Yes	Explain why balloon expands upon heating.	51	3.6	63	5.5	40	4.2
Q12	Yes	Explain how focusing affects the amount of light.	48	3.6	52	5.0	44	4.2
Q13	Yes	Compare heat expansion properties of metal and glass.	83	3.0	84	4.3	82	4.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	37	3.3	38	4.4	35	4.3
R01	Yes	Choose diagram showing angle of reflected light.	76	3.5	76	4.7	76	4.4
R02	Yes	Identify reflection/absorption properties from color.	44	3.8	41	5.0	46	5.8
Y01	Yes	Explain amount of light/electric energy in a lamp.	10	1.7	12	2.2	9	2.1
Y02	Yes	Explain temperature of melting snowball.	18	2.0	17	2.0	19	3.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=New Zealand SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	85	1.0	88	1.1	82	1.5
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	74	1.5	75	1.9	74	2.2
F06	No	Relate rusting iron to the presence of oxygen and moisture.	70	1.7	74	1.8	67	2.6
G10	No	Select correct statement regarding the atomic makeup of matter.	57	1.8	64	2.1	50	2.5
H06	No	Know if wood-burning reaction absorbs or releases energy.	60	1.7	68	2.2	52	2.3
J03	Yes	Know relationship between molecules, atoms and cells.	27	2.5	33	3.6	20	3.0
J04	Yes	Distiguish between a chemical reaction and a physical change.	40	2.7	39	3.6	41	3.6
J06	Yes	Know what happens to atoms in animal after death.	32	2.6	36	4.0	28	3.4
J08	Yes	Identify gas involved in fire ignition.	45	2.9	47	4.2	43	3.5
M10	Yes	Identify substances which are mixtures.	54	2.7	54	3.9	53	3.6
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	49	2.7	54	3.6	43	3.7
N07	Yes	Explain oxygen fuel requirements of burning candle.	93	1.3	95	1.8	90	1.9
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	55	2.8	55	3.7	54	4.0
O11	Yes	Identify which change in elemental form is due to a chemical change.	36	2.5	43	3.5	29	3.3
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	18	2.2	18	2.9	18	2.9
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	46	2.9	49	3.7	43	3.8
Q15	Yes	Determine physical processes involving chemical change.	42	2.4	41	2.9	42	3.4
R05	Yes	Explain how carbon dioxide fire extinguishers work.	65	2.4	68	2.9	61	3.6
Z01A	Yes	Explain why steel bridges must be painted.	67	2.4	71	3.3	63	2.9
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	55	3.1	59	4.0	49	4.3
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	40	2.6	42	3.7	38	3.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=New Zealand SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	55	1.4	59	1.7	51	1.9
B01	No	Identify hottest layer of the Earth.	90	0.8	94	0.9	86	1.3
B05	No	Use elevation/weather diagram to locate earth feature.	53	1.4	53	1.9	52	2.0
C07	No	Relate mountain shape to age.	24	1.5	31	2.2	17	1.7
D03	No	Identify direction of river flow on contour map.	37	1.7	43	2.1	29	2.1
E09	No	Use table of time/temperature to determine point when weather changes.	88	1.0	90	1.3	87	1.4
E12	No	Identify type of stone involved in cave formation.	50	1.6	54	2.2	45	2.1
F05	No	Relate level of oxygen to elevation.	89	0.8	90	1.2	88	1.2
G11	No	Identify type of rock from description of its formation.	41	1.9	43	2.7	39	2.5
H03	No	Select explanation for moonlight.	80	1.6	84	1.7	76	2.5
H04	No	Identify ground layer containing the most organic material.	46	1.5	52	1.8	39	2.2
I17	Yes	Know energy source for Earth’s water cycle.	39	2.5	37	3.1	40	3.5
J01	Yes	Know changes in Earth’s surface over billions of years.	41	2.6	44	3.7	38	3.4
K15	Yes	Know organic origins of fossil fuels.	60	2.1	63	3.2	57	3.1
O12	Yes	Know relative amounts of components in air.	18	2.2	21	3.4	14	2.5
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	64	2.4	70	3.1	58	3.6
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	89	1.5	86	2.2	92	1.9
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	33	2.4	39	3.6	28	3.1
Q16	Yes	Estimate time for light from star to reach Earth.	41	2.4	47	3.6	34	3.1
R04	Yes	Give reason why ozone layer is important for life.	64	2.7	68	3.2	60	3.9
W01A	Yes	Give reason region in land/water diagram is a good farming location.	89	1.3	89	1.7	88	1.8
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	68	1.8	72	2.3	65	2.3
W02	Yes	Draw diagram showing Earth’s water cycle.	29	1.9	36	2.7	22	2.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=New Zealand SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	68	1.2	71	1.5	65	1.6
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	55	1.9	62	2.6	47	2.2
F04	No	Predict type of area where soil erosion by rain is most likely.	77	1.5	80	1.9	74	2.3
G12	No	Identify a nonrenewable natural resource.	60	1.6	66	2.3	53	1.9
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	36	2.6	35	3.6	37	3.6
I13	Yes	Select best scale for accurate measurement.	43	2.5	47	3.3	38	3.7
I15	Yes	Identify the type of scientific statement given in an experimental report.	53	2.6	53	3.5	53	3.9
I18	Yes	Write conclusion from summary of experimental observations.	54	3.0	52	3.8	57	4.3
K19	Yes	Write an example of how computers are used to do work.	89	1.6	90	2.2	87	2.3
N01	Yes	Determine correct control experiment to test hypothesis.	47	2.6	44	3.7	50	3.7
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	68	2.5	72	3.5	63	3.5
N05	Yes	Identify a principal cause of acid rain.	31	2.0	35	3.2	26	3.0
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	63	2.8	62	4.4	65	3.0
Z02A	Yes	Write a reason why not all people have enough water.	82	1.9	77	2.8	88	2.2
Z02B	Yes	Write a second reason why not all people have enough water.	59	2.5	56	3.5	62	3.5

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=New Zealand SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	71	1.2	68	1.6	73	1.6
B04	No	Predict pulse/breathing rate change after exercise.	93	0.7	93	0.9	92	1.1
C08	No	Identify carrier of signals from eye to brain.	71	1.6	72	2.2	70	1.8
D05	No	Identify system carrying sensory messages to the brain.	65	1.5	69	2.1	60	2.0
D06	No	Relate plant part to seed development.	68	1.8	71	2.0	65	2.6
E08	No	Select correct statement of trait heredity from parents.	68	1.7	63	2.4	73	2.0
E10	No	Determine characteristics for classifying animals.	62	1.9	64	2.4	61	2.2
F01	No	Identify characteristic of mammal.	55	1.8	55	2.3	54	2.3
F03	No	Identify human organ which interprets senses.	81	1.2	81	1.7	82	1.6
G08	No	Identify main function of red blood cells.	66	1.4	71	1.9	60	1.7
G09	No	Identify reproductive cells involved in heredity.	68	1.5	63	2.0	74	2.0
H01	No	Identify the functions of blood.	71	1.5	70	2.3	72	2.0
H02	No	Identify the role of vitamins.	78	1.4	76	1.8	80	1.9
I10	Yes	Identify nutrition content of fruits and vegetables.	70	2.1	70	2.8	70	2.8
I11	Yes	Know identifying features of insects.	56	2.6	57	3.6	55	3.4
I14	Yes	Relate elbow action to a simple machine.	57	2.4	56	3.3	57	3.4
I19	Yes	Identify statement of oxygen production consistent with data.	57	2.6	59	3.9	56	3.6
J02	Yes	Choose species on Earth for shortest time.	86	1.9	90	2.2	82	2.9
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	45	2.5	44	3.5	46	3.2
J09	Yes	Explain how to determine the age of a cut tree.	86	2.0	89	2.4	83	3.0
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	60	2.5	59	3.2	60	3.7
K12	Yes	Relate reproductive cell production to population.	63	2.6	67	3.5	59	3.5
K16	Yes	Identify common product made with bacteria.	41	2.4	43	3.5	39	3.5
K18	Yes	Identify main function of chloroplasts in plant cell.	48	2.3	49	3.4	47	3.4
L02	Yes	Select reason why algae are close to ocean surface.	45	2.9	48	3.8	41	3.7
L03	Yes	Identify skull features typical of predators.	62	2.7	64	3.3	59	3.8
L05	Yes	Select most likely purpose for birds' singing.	59	2.3	58	3.4	59	3.7
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	62	2.6	68	3.7	56	3.4
M11	Yes	Complete a food web showing energy relationships.	75	2.3	76	3.3	73	3.2
N02	Yes	Choose meal which would give the most nutrients.	44	2.7	41	3.8	47	3.6
N04	Yes	Identify how decaying fish fertilize plants.	50	2.5	52	3.3	47	3.9
N06	Yes	Identify the most basic unit of living things.	56	2.7	60	3.8	51	3.9
O16	Yes	Give reason for thirst on a hot day.	62	2.6	61	4.1	63	3.3
O17	Yes	Describe how disease may be transmitted.	57	2.1	53	3.1	60	3.2
P04	Yes	Identify what happens to animals' biological processes during hibernation.	44	2.8	44	3.5	43	3.7
P06	Yes	Describe digestion occuring in the mouth.	44	2.7	44	3.7	45	4.1
Q17	Yes	Describe the advantage of having two eyes.	85	1.8	84	2.5	86	2.5
R03	Yes	Give example of consequences of introducing new species.	22	1.8	26	2.8	18	2.8
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	26	1.9	24	2.8	29	2.5
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	78	1.4	76	2.1	81	2.0
X02B	Yes	Explain why light is important in aquarium ecosystem.	20	1.9	21	2.4	19	2.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=New Zealand SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	77	1.0	77	1.3	77	1.2
A10	No	Relate light level and reflectance to vision of object.	75	1.1	76	1.5	73	1.2
B02	No	Know type of energy released from combustion engine.	58	1.3	59	1.9	56	1.6
B03	No	Determine density from mass/volume table.	17	1.1	20	1.8	14	1.2
B06	No	Relate color of object to amount of light reflection.	83	1.1	84	1.4	81	1.5
C09	No	Identify correct position of reflected image.	75	1.4	78	1.9	73	2.0
C12	No	Identify substance which is NOT a fossil fuel.	49	1.8	53	2.5	45	2.3
D01	No	Identify correct diagram of light rays through lens.	40	1.7	48	2.1	32	2.2
D02	No	Identify substance from magnetic properties.	74	1.5	79	1.9	70	2.3
D04	No	Relate physical event to its sequence of energy changes.	64	1.3	69	1.8	58	1.8
E07	No	Identify particles found in the nucleus of atoms.	38	1.8	40	2.5	35	2.1
E11	No	Find shadow size from diagram of bulb/card/screen distances.	58	1.6	63	2.1	54	2.2
F02	No	Relate color and light reflection to temperature of object.	58	2.0	60	2.7	55	2.3
G07	No	Identify correct way to place batteries in a flashlight.	89	1.0	94	1.0	84	1.5
H05	No	Identify source of energy stored in food.	25	1.6	26	2.5	24	1.9
I16	Yes	Identify material with greatest heat conductivity.	87	1.7	85	2.7	89	2.4
J05	Yes	Identify type of solar radiation that causes sunburn.	84	1.9	84	2.6	84	2.5
K10	Yes	Describe a method demonstrating the existence of air.	43	2.6	41	3.5	46	3.6
K13	Yes	Identify electrical conductors that form complete circuits.	82	1.7	85	2.2	78	2.8
K14	Yes	Relate evaporation rate to surface area.	86	1.7	85	2.6	87	2.2
K17	Yes	Relate presence of gravitational force to position of falling object.	54	2.7	58	3.7	49	3.9
L01	Yes	Select diagram showing forces resulting in rotation.	49	2.5	55	3.9	42	3.2
L04	Yes	Explain most efficient engine.	49	2.6	48	3.2	50	3.8
L07	Yes	Relate sound transmission to air.	74	2.0	78	3.1	70	3.2
M12	Yes	Complete table of voltage/current data for circuit.	55	2.9	65	3.4	44	3.9
M14	Yes	Draw reflected image of object.	78	1.8	83	2.3	72	2.8
N08	Yes	Relate lever arm lengths to balanced weights.	78	2.0	80	2.5	75	3.0
N10	Yes	Determine effect of tipping container on water surface.	55	2.5	66	3.0	44	3.6
O10	Yes	Identify polarity of ends of cut magnet.	54	2.5	59	3.6	49	3.9
O13	Yes	Relate circular motion to centripetal force.	65	2.3	72	3.2	58	3.4
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	92	1.6	90	2.7	94	1.6
P02	Yes	Explain relationship between illuminance and distance of light source.	31	2.5	31	3.4	31	3.1
P05	Yes	Explain why balloon expands upon heating.	48	2.9	47	3.8	49	4.1
Q12	Yes	Explain how focusing affects the amount of light.	56	2.7	57	3.4	54	3.9
Q13	Yes	Compare heat expansion properties of metal and glass.	58	2.4	58	3.6	57	3.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	32	2.0	33	3.1	31	3.0
R01	Yes	Choose diagram showing angle of reflected light.	82	2.0	85	2.4	78	3.0
R02	Yes	Identify reflection/absorption properties from color.	46	2.2	47	3.2	45	3.2
Y01	Yes	Explain amount of light/electric energy in a lamp.	6	1.1	7	1.5	5	1.2
Y02	Yes	Explain temperature of melting snowball.	24	1.5	25	2.2	22	2.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Norway SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	87	0.7	89	1.1	85	0.9
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	77	1.3	75	1.5	78	1.9
F06	No	Relate rusting iron to the presence of oxygen and moisture.	75	1.4	74	1.9	76	1.8
G10	No	Select correct statement regarding the atomic makeup of matter.	63	2.0	68	2.5	59	2.4
H06	No	Know if wood-burning reaction absorbs or releases energy.	45	1.6	53	2.3	37	2.2
J03	Yes	Know relationship between molecules, atoms and cells.	29	1.9	37	3.1	23	2.7
J04	Yes	Distiguish between a chemical reaction and a physical change.	19	2.0	22	3.3	17	2.4
J06	Yes	Know what happens to atoms in animal after death.	19	1.9	20	2.9	18	2.8
J08	Yes	Identify gas involved in fire ignition.	61	2.5	66	3.7	57	3.3
M10	Yes	Identify substances which are mixtures.	52	2.8	52	4.1	51	3.7
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	37	2.5	40	3.9	34	3.2
N07	Yes	Explain oxygen fuel requirements of burning candle.	95	1.1	94	1.7	96	1.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	51	3.0	50	3.7	52	4.5
O11	Yes	Identify which change in elemental form is due to a chemical change.	44	2.8	51	3.6	36	3.4
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	19	1.9	27	3.5	11	2.1
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	51	2.7	53	3.4	50	4.0
Q15	Yes	Determine physical processes involving chemical change.	12	1.7	12	2.5	12	2.3
R05	Yes	Explain how carbon dioxide fire extinguishers work.	63	2.2	63	3.2	63	3.3
Z01A	Yes	Explain why steel bridges must be painted.	62	2.3	67	3.1	57	3.4
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	43	2.5	47	3.5	38	3.6
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	29	2.3	28	3.1	31	3.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Norway SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	70	0.9	72	1.2	68	1.2
B01	No	Identify hottest layer of the Earth.	93	0.7	95	0.9	91	1.0
B05	No	Use elevation/weather diagram to locate earth feature.	50	1.4	53	2.0	47	1.6
C07	No	Relate mountain shape to age.	54	1.7	58	2.3	50	2.3
D03	No	Identify direction of river flow on contour map.	40	1.5	50	2.3	32	2.0
E09	No	Use table of time/temperature to determine point when weather changes.	78	1.3	77	1.9	80	1.7
E12	No	Identify type of stone involved in cave formation.	52	1.8	54	2.4	51	2.4
F05	No	Relate level of oxygen to elevation.	86	1.0	87	1.4	85	1.4
G11	No	Identify type of rock from description of its formation.	35	1.8	37	2.4	33	2.3
H03	No	Select explanation for moonlight.	90	0.9	92	1.2	88	1.2
H04	No	Identify ground layer containing the most organic material.	53	1.5	58	2.0	48	2.0
I17	Yes	Know energy source for Earth’s water cycle.	38	2.4	42	3.2	35	3.6
J01	Yes	Know changes in Earth’s surface over billions of years.	55	2.7	56	4.3	54	3.4
K15	Yes	Know organic origins of fossil fuels.	69	2.6	71	3.2	68	3.5
O12	Yes	Know relative amounts of components in air.	27	2.7	29	3.5	25	3.4
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	76	2.2	79	2.7	72	3.3
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	91	1.4	88	2.4	93	1.7
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	48	3.3	57	4.5	38	3.8
Q16	Yes	Estimate time for light from star to reach Earth.	43	3.1	49	4.1	38	3.9
R04	Yes	Give reason why ozone layer is important for life.	71	2.5	71	3.2	71	3.5
W01A	Yes	Give reason region in land/water diagram is a good farming location.	86	1.3	84	1.7	88	1.8
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	42	1.8	45	2.8	40	2.1
W02	Yes	Draw diagram showing Earth’s water cycle.	55	2.0	57	2.7	52	2.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Norway SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	65	1.1	65	1.5	64	1.5
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	61	1.5	65	2.0	57	2.0
F04	No	Predict type of area where soil erosion by rain is most likely.	76	1.2	78	1.9	74	1.6
G12	No	Identify a nonrenewable natural resource.	49	1.6	49	2.2	49	2.6
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	41	2.5	46	3.9	37	3.0
I13	Yes	Select best scale for accurate measurement.	72	2.3	73	3.4	71	3.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	37	2.5	42	3.5	30	3.7
I18	Yes	Write conclusion from summary of experimental observations.	31	2.5	34	3.5	28	3.8
K19	Yes	Write an example of how computers are used to do work.	84	1.9	85	2.4	83	2.6
N01	Yes	Determine correct control experiment to test hypothesis.	50	2.7	44	3.3	55	4.0
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	57	2.8	59	3.5	56	4.1
N05	Yes	Identify a principal cause of acid rain.	31	2.3	32	3.0	30	3.8
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	53	2.7	49	3.8	57	3.6
Z02A	Yes	Write a reason why not all people have enough water.	71	2.5	67	3.9	76	3.0
Z02B	Yes	Write a second reason why not all people have enough water.	54	2.4	50	3.5	59	3.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Norway SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	54	1.1	48	1.5	59	1.4
B04	No	Predict pulse/breathing rate change after exercise.	93	0.7	91	1.3	95	0.8
C08	No	Identify carrier of signals from eye to brain.	51	1.6	54	2.3	49	2.2
D05	No	Identify system carrying sensory messages to the brain.	55	1.7	57	2.3	53	2.5
D06	No	Relate plant part to seed development.	67	1.7	69	2.1	65	2.2
E08	No	Select correct statement of trait heredity from parents.	89	0.9	86	1.5	92	1.3
E10	No	Determine characteristics for classifying animals.	64	1.4	64	1.9	65	2.1
F01	No	Identify characteristic of mammal.	60	1.6	58	2.2	62	2.3
F03	No	Identify human organ which interprets senses.	90	0.8	88	1.3	91	1.2
G08	No	Identify main function of red blood cells.	55	1.6	58	2.1	52	2.2
G09	No	Identify reproductive cells involved in heredity.	79	1.2	77	1.7	80	1.7
H01	No	Identify the functions of blood.	71	1.7	74	1.8	69	2.7
H02	No	Identify the role of vitamins.	93	0.9	91	1.2	94	1.2
I10	Yes	Identify nutrition content of fruits and vegetables.	81	2.3	76	3.7	86	2.5
I11	Yes	Know identifying features of insects.	57	2.3	60	3.5	54	3.9
I14	Yes	Relate elbow action to a simple machine.	31	2.5	28	3.4	34	3.4
I19	Yes	Identify statement of oxygen production consistent with data.	57	2.7	59	4.1	54	3.8
J02	Yes	Choose species on Earth for shortest time.	79	2.1	81	3.1	77	2.6
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	56	2.5	50	3.5	61	3.3
J09	Yes	Explain how to determine the age of a cut tree.	96	1.0	95	1.9	97	0.9
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	59	2.6	61	3.4	56	3.6
K12	Yes	Relate reproductive cell production to population.	49	2.8	50	4.2	48	3.7
K16	Yes	Identify common product made with bacteria.	26	2.3	29	3.7	24	3.0
K18	Yes	Identify main function of chloroplasts in plant cell.	43	2.6	44	3.7	41	3.5
L02	Yes	Select reason why algae are close to ocean surface.	55	2.7	61	3.6	49	3.1
L03	Yes	Identify skull features typical of predators.	72	2.3	72	3.6	73	3.4
L05	Yes	Select most likely purpose for birds' singing.	84	2.4	80	3.4	87	2.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	46	2.6	43	3.9	48	3.7
M11	Yes	Complete a food web showing energy relationships.	78	2.2	75	3.6	82	2.7
N02	Yes	Choose meal which would give the most nutrients.	63	2.3	57	3.7	69	3.3
N04	Yes	Identify how decaying fish fertilize plants.	44	2.7	45	3.6	43	3.9
N06	Yes	Identify the most basic unit of living things.	66	2.3	66	3.4	66	3.7
O16	Yes	Give reason for thirst on a hot day.	69	2.9	73	3.7	64	3.8
O17	Yes	Describe how disease may be transmitted.	89	1.4	86	2.4	92	1.8
P04	Yes	Identify what happens to animals' biological processes during hibernation.	54	3.0	57	3.8	52	4.0
P06	Yes	Describe digestion occuring in the mouth.	27	2.4	25	3.0	30	3.6
Q17	Yes	Describe the advantage of having two eyes.	81	2.0	79	3.0	84	3.0
R03	Yes	Give example of consequences of introducing new species.	11	1.5	11	2.2	11	2.4
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	24	1.8	22	2.4	25	2.3
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	72	1.6	68	2.4	75	2.2
X02B	Yes	Explain why light is important in aquarium ecosystem.	35	1.9	36	2.7	34	2.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Norway SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	75	0.7	76	1.3	74	1.0
A10	No	Relate light level and reflectance to vision of object.	78	0.8	80	1.0	77	1.2
B02	No	Know type of energy released from combustion engine.	49	1.3	51	1.8	47	2.0
B03	No	Determine density from mass/volume table.	37	1.5	43	2.2	30	1.8
B06	No	Relate color of object to amount of light reflection.	82	1.1	83	1.5	81	1.6
C09	No	Identify correct position of reflected image.	65	1.5	69	2.1	62	2.4
C12	No	Identify substance which is NOT a fossil fuel.	34	1.7	39	2.0	30	2.2
D01	No	Identify correct diagram of light rays through lens.	51	1.5	65	2.4	37	2.0
D02	No	Identify substance from magnetic properties.	74	1.4	82	1.9	66	2.2
D04	No	Relate physical event to its sequence of energy changes.	50	1.7	51	2.4	49	2.1
E07	No	Identify particles found in the nucleus of atoms.	28	1.5	28	2.0	29	1.9
E11	No	Find shadow size from diagram of bulb/card/screen distances.	59	1.5	66	2.1	53	2.2
F02	No	Relate color and light reflection to temperature of object.	71	1.2	72	2.1	70	1.7
G07	No	Identify correct way to place batteries in a flashlight.	89	1.0	92	1.1	86	1.8
H05	No	Identify source of energy stored in food.	34	2.2	35	2.7	33	2.7
I16	Yes	Identify material with greatest heat conductivity.	88	1.6	88	2.2	89	2.2
J05	Yes	Identify type of solar radiation that causes sunburn.	81	2.1	82	3.5	81	2.7
K10	Yes	Describe a method demonstrating the existence of air.	40	3.0	32	4.1	48	3.7
K13	Yes	Identify electrical conductors that form complete circuits.	74	2.4	85	2.7	63	3.3
K14	Yes	Relate evaporation rate to surface area.	79	2.3	83	2.8	74	3.2
K17	Yes	Relate presence of gravitational force to position of falling object.	49	2.9	54	3.8	45	3.7
L01	Yes	Select diagram showing forces resulting in rotation.	45	2.5	50	3.8	40	3.8
L04	Yes	Explain most efficient engine.	37	2.4	39	3.4	34	3.7
L07	Yes	Relate sound transmission to air.	74	2.6	72	3.5	76	2.6
M12	Yes	Complete table of voltage/current data for circuit.	48	2.8	51	4.0	46	4.0
M14	Yes	Draw reflected image of object.	63	2.7	58	3.9	68	3.4
N08	Yes	Relate lever arm lengths to balanced weights.	88	1.6	92	1.9	85	2.6
N10	Yes	Determine effect of tipping container on water surface.	61	2.4	69	3.2	51	3.5
O10	Yes	Identify polarity of ends of cut magnet.	54	2.6	51	3.5	58	3.7
O13	Yes	Relate circular motion to centripetal force.	71	2.3	75	3.4	67	3.8
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	89	1.8	86	2.6	92	2.3
P02	Yes	Explain relationship between illuminance and distance of light source.	25	2.4	27	3.5	23	3.1
P05	Yes	Explain why balloon expands upon heating.	69	2.7	71	3.7	67	3.8
Q12	Yes	Explain how focusing affects the amount of light.	58	2.7	64	3.2	52	3.9
Q13	Yes	Compare heat expansion properties of metal and glass.	77	2.2	75	3.2	80	3.0
Q18	Yes	Explain effect of melting on the mass of ice cubes.	32	2.8	35	3.5	28	4.1
R01	Yes	Choose diagram showing angle of reflected light.	61	2.5	64	3.3	58	3.9
R02	Yes	Identify reflection/absorption properties from color.	36	2.0	38	3.5	34	3.0
Y01	Yes	Explain amount of light/electric energy in a lamp.	3	0.6	4	0.9	3	0.8
Y02	Yes	Explain temperature of melting snowball.	17	1.5	16	2.0	19	2.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Portugal SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	75	1.1	80	1.2	69	1.4
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	81	1.2	79	1.7	84	1.6
F06	No	Relate rusting iron to the presence of oxygen and moisture.	70	1.5	74	1.8	65	2.5
G10	No	Select correct statement regarding the atomic makeup of matter.	49	1.9	53	2.1	45	2.8
H06	No	Know if wood-burning reaction absorbs or releases energy.	58	1.7	69	2.0	47	2.3
J03	Yes	Know relationship between molecules, atoms and cells.	37	2.4	35	3.2	38	3.2
J04	Yes	Distiguish between a chemical reaction and a physical change.	48	3.1	53	3.7	44	4.5
J06	Yes	Know what happens to atoms in animal after death.	16	1.6	16	2.2	16	2.2
J08	Yes	Identify gas involved in fire ignition.	43	2.8	51	3.2	36	4.1
M10	Yes	Identify substances which are mixtures.	46	2.8	48	3.7	44	4.1
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	64	2.4	66	3.9	63	3.9
N07	Yes	Explain oxygen fuel requirements of burning candle.	89	1.5	92	1.9	86	2.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	48	2.6	56	3.8	39	3.2
O11	Yes	Identify which change in elemental form is due to a chemical change.	46	2.8	48	4.0	43	3.4
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	68	2.5	70	3.3	66	3.5
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	26	2.4	26	3.4	26	3.2
Q15	Yes	Determine physical processes involving chemical change.	40	2.7	43	3.7	37	3.4
R05	Yes	Explain how carbon dioxide fire extinguishers work.	35	2.7	47	4.2	24	3.4
Z01A	Yes	Explain why steel bridges must be painted.	69	2.3	75	2.8	62	3.4
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	29	2.3	31	3.5	26	3.1
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	18	2.1	21	3.2	14	2.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Portugal SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	49	1.2	53	1.6	45	1.4
B01	No	Identify hottest layer of the Earth.	91	0.9	94	1.1	87	1.2
B05	No	Use elevation/weather diagram to locate earth feature.	54	1.4	56	2.1	53	2.1
C07	No	Relate mountain shape to age.	37	1.8	40	2.3	33	2.2
D03	No	Identify direction of river flow on contour map.	21	1.3	25	1.7	17	1.5
E09	No	Use table of time/temperature to determine point when weather changes.	87	1.1	88	1.4	86	1.4
E12	No	Identify type of stone involved in cave formation.	52	2.0	56	2.7	48	2.3
F05	No	Relate level of oxygen to elevation.	78	1.4	83	1.5	73	2.2
G11	No	Identify type of rock from description of its formation.	44	1.7	42	2.3	47	2.1
H03	No	Select explanation for moonlight.	79	1.7	85	1.7	73	2.3
H04	No	Identify ground layer containing the most organic material.	43	1.6	48	2.1	38	2.2
I17	Yes	Know energy source for Earth’s water cycle.	32	2.2	32	3.1	31	3.6
J01	Yes	Know changes in Earth’s surface over billions of years.	39	2.6	40	3.5	39	3.4
K15	Yes	Know organic origins of fossil fuels.	78	2.3	77	3.3	80	3.2
O12	Yes	Know relative amounts of components in air.	8	1.5	11	2.3	6	1.8
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	49	2.3	56	2.9	43	2.9
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	82	2.4	81	3.2	83	2.8
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	39	3.0	43	4.3	34	3.5
Q16	Yes	Estimate time for light from star to reach Earth.	27	2.3	33	3.7	22	3.5
R04	Yes	Give reason why ozone layer is important for life.	50	2.9	57	4.1	43	3.6
W01A	Yes	Give reason region in land/water diagram is a good farming location.	79	1.6	79	2.3	79	1.9
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	24	1.6	24	2.1	24	2.3
W02	Yes	Draw diagram showing Earth’s water cycle.	24	1.5	26	2.4	22	1.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Portugal SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	50	1.2	53	1.5	47	1.5
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	39	1.6	45	2.2	32	2.1
F04	No	Predict type of area where soil erosion by rain is most likely.	60	1.6	62	2.1	58	2.4
G12	No	Identify a nonrenewable natural resource.	56	1.5	58	2.1	55	1.9
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	22	1.9	22	2.4	22	2.9
I13	Yes	Select best scale for accurate measurement.	59	2.5	60	3.7	59	3.2
I15	Yes	Identify the type of scientific statement given in an experimental report.	45	2.7	40	3.8	52	3.8
I18	Yes	Write conclusion from summary of experimental observations.	30	2.9	25	3.4	34	4.0
K19	Yes	Write an example of how computers are used to do work.	55	2.4	54	3.7	55	3.2
N01	Yes	Determine correct control experiment to test hypothesis.	49	2.2	47	3.0	51	3.3
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	54	2.9	59	4.0	49	3.7
N05	Yes	Identify a principal cause of acid rain.	32	2.2	31	3.1	34	3.3
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	35	1.9	34	2.9	35	3.1
Z02A	Yes	Write a reason why not all people have enough water.	61	2.7	61	3.7	61	3.7
Z02B	Yes	Write a second reason why not all people have enough water.	22	2.1	21	2.6	23	3.0

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Portugal SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	64	1.5	62	1.9	65	1.6
B04	No	Predict pulse/breathing rate change after exercise.	94	0.6	96	0.8	93	1.0
C08	No	Identify carrier of signals from eye to brain.	63	1.9	66	2.2	59	2.6
D05	No	Identify system carrying sensory messages to the brain.	64	1.9	69	2.0	59	2.8
D06	No	Relate plant part to seed development.	54	2.1	57	2.7	51	2.6
E08	No	Select correct statement of trait heredity from parents.	87	0.9	86	1.4	89	1.2
E10	No	Determine characteristics for classifying animals.	31	1.4	35	2.2	27	1.8
F01	No	Identify characteristic of mammal.	75	1.4	77	1.6	74	2.2
F03	No	Identify human organ which interprets senses.	68	1.5	70	1.9	66	2.3
G08	No	Identify main function of red blood cells.	74	1.8	78	1.9	71	2.5
G09	No	Identify reproductive cells involved in heredity.	82	1.2	81	1.8	84	1.4
H01	No	Identify the functions of blood.	71	1.7	70	2.2	72	2.3
H02	No	Identify the role of vitamins.	83	1.4	83	1.6	82	1.8
I10	Yes	Identify nutrition content of fruits and vegetables.	67	2.5	68	3.6	65	4.1
I11	Yes	Know identifying features of insects.	27	2.5	30	3.6	24	2.9
I14	Yes	Relate elbow action to a simple machine.	39	2.6	41	3.7	36	3.6
I19	Yes	Identify statement of oxygen production consistent with data.	59	2.7	54	3.6	64	3.8
J02	Yes	Choose species on Earth for shortest time.	74	2.2	81	2.5	68	3.4
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	48	2.4	51	3.6	44	3.4
J09	Yes	Explain how to determine the age of a cut tree.	45	2.8	49	3.8	41	4.4
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	60	2.3	62	3.3	56	3.8
K12	Yes	Relate reproductive cell production to population.	56	2.4	57	3.4	56	3.8
K16	Yes	Identify common product made with bacteria.	26	2.3	29	3.2	24	2.6
K18	Yes	Identify main function of chloroplasts in plant cell.	39	2.2	39	3.3	38	3.6
L02	Yes	Select reason why algae are close to ocean surface.	49	2.8	55	3.7	43	3.6
L03	Yes	Identify skull features typical of predators.	65	2.4	69	3.2	60	4.1
L05	Yes	Select most likely purpose for birds' singing.	61	2.2	64	3.2	57	3.3
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	38	2.6	40	3.2	35	3.6
M11	Yes	Complete a food web showing energy relationships.	65	2.5	65	3.1	66	3.6
N02	Yes	Choose meal which would give the most nutrients.	40	2.8	38	3.6	42	4.0
N04	Yes	Identify how decaying fish fertilize plants.	51	2.9	57	4.3	46	3.9
N06	Yes	Identify the most basic unit of living things.	62	2.9	63	3.3	62	3.7
O16	Yes	Give reason for thirst on a hot day.	63	2.7	62	3.5	64	3.2
O17	Yes	Describe how disease may be transmitted.	20	1.9	17	2.2	23	3.1
P04	Yes	Identify what happens to animals' biological processes during hibernation.	46	2.5	54	3.2	39	3.4
P06	Yes	Describe digestion occuring in the mouth.	43	2.7	45	4.3	41	4.1
Q17	Yes	Describe the advantage of having two eyes.	64	2.9	67	3.5	61	4.3
R03	Yes	Give example of consequences of introducing new species.	12	1.7	13	2.4	12	2.2
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	3	0.6	3	0.9	2	0.8
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	56	1.8	54	2.1	58	2.7
X02B	Yes	Explain why light is important in aquarium ecosystem.	27	1.8	28	2.2	26	2.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Portugal SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	59	1.2	60	1.3	59	1.6
A10	No	Relate light level and reflectance to vision of object.	72	1.0	74	1.2	71	1.3
B02	No	Know type of energy released from combustion engine.	56	1.7	58	2.1	54	2.1
B03	No	Determine density from mass/volume table.	17	1.1	19	1.4	15	1.5
B06	No	Relate color of object to amount of light reflection.	80	1.2	81	1.7	80	1.6
C09	No	Identify correct position of reflected image.	62	1.7	67	1.9	57	2.7
C12	No	Identify substance which is NOT a fossil fuel.	55	1.7	56	2.0	55	2.3
D01	No	Identify correct diagram of light rays through lens.	38	1.9	48	2.4	27	2.0
D02	No	Identify substance from magnetic properties.	73	1.6	80	1.5	67	2.4
D04	No	Relate physical event to its sequence of energy changes.	46	1.5	49	2.0	42	2.0
E07	No	Identify particles found in the nucleus of atoms.	34	1.8	32	1.9	35	2.6
E11	No	Find shadow size from diagram of bulb/card/screen distances.	58	1.5	61	1.8	55	2.4
F02	No	Relate color and light reflection to temperature of object.	43	1.9	48	2.2	38	2.7
G07	No	Identify correct way to place batteries in a flashlight.	89	0.9	92	0.9	85	1.5
H05	No	Identify source of energy stored in food.	10	1.0	9	1.1	10	1.4
I16	Yes	Identify material with greatest heat conductivity.	80	2.4	84	2.9	75	3.4
J05	Yes	Identify type of solar radiation that causes sunburn.	65	2.2	70	2.8	60	3.4
K10	Yes	Describe a method demonstrating the existence of air.	37	2.6	38	2.9	36	4.1
K13	Yes	Identify electrical conductors that form complete circuits.	74	2.3	82	2.7	65	3.4
K14	Yes	Relate evaporation rate to surface area.	78	2.0	79	2.7	77	2.8
K17	Yes	Relate presence of gravitational force to position of falling object.	53	2.7	48	3.6	59	4.1
L01	Yes	Select diagram showing forces resulting in rotation.	32	2.6	37	3.6	27	3.2
L04	Yes	Explain most efficient engine.	21	2.4	21	3.0	22	3.2
L07	Yes	Relate sound transmission to air.	71	2.1	72	3.0	69	3.7
M12	Yes	Complete table of voltage/current data for circuit.	38	2.7	48	3.9	28	3.1
M14	Yes	Draw reflected image of object.	56	2.9	53	3.3	59	4.1
N08	Yes	Relate lever arm lengths to balanced weights.	67	2.1	79	2.9	55	3.3
N10	Yes	Determine effect of tipping container on water surface.	38	2.7	48	3.7	28	3.2
O10	Yes	Identify polarity of ends of cut magnet.	40	2.4	44	3.7	36	3.4
O13	Yes	Relate circular motion to centripetal force.	57	2.6	66	3.1	48	3.9
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	89	1.5	92	1.9	85	2.7
P02	Yes	Explain relationship between illuminance and distance of light source.	17	2.1	20	2.8	15	2.6
P05	Yes	Explain why balloon expands upon heating.	51	2.7	58	3.8	45	3.5
Q12	Yes	Explain how focusing affects the amount of light.	35	2.5	36	3.3	34	3.2
Q13	Yes	Compare heat expansion properties of metal and glass.	44	2.4	51	3.0	38	3.5
Q18	Yes	Explain effect of melting on the mass of ice cubes.	20	2.2	23	3.5	18	2.4
R01	Yes	Choose diagram showing angle of reflected light.	62	2.5	64	3.5	60	3.2
R02	Yes	Identify reflection/absorption properties from color.	31	2.4	39	3.6	24	2.7
Y01	Yes	Explain amount of light/electric energy in a lamp.	4	0.8	4	1.0	4	1.1
Y02	Yes	Explain temperature of melting snowball.	10	1.1	8	1.4	12	2.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Romania SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	66	1.6	66	2.0	66	1.9
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	82	1.4	81	1.9	82	1.8
F06	No	Relate rusting iron to the presence of oxygen and moisture.	71	1.7	71	2.1	71	2.1
G10	No	Select correct statement regarding the atomic makeup of matter.	52	2.4	54	2.8	50	2.9
H06	No	Know if wood-burning reaction absorbs or releases energy.	53	2.0	56	2.5	51	2.5
J03	Yes	Know relationship between molecules, atoms and cells.	31	3.2	28	3.3	33	4.0
J04	Yes	Distiguish between a chemical reaction and a physical change.	47	2.9	49	3.3	45	3.7
J06	Yes	Know what happens to atoms in animal after death.	27	2.5	24	3.0	30	3.7
J08	Yes	Identify gas involved in fire ignition.	59	2.3	60	3.5	58	3.4
M10	Yes	Identify substances which are mixtures.	33	2.5	33	4.0	34	3.1
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	38	2.8	42	3.5	34	3.1
N07	Yes	Explain oxygen fuel requirements of burning candle.	87	1.7	89	2.1	84	2.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	42	3.5	47	4.5	36	4.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	36	2.9	39	4.1	34	3.4
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	74	2.6	71	3.8	76	3.1
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	37	2.8	36	3.5	38	4.0
Q15	Yes	Determine physical processes involving chemical change.	21	2.4	25	3.3	17	2.5
R05	Yes	Explain how carbon dioxide fire extinguishers work.	33	2.5	34	3.0	32	3.5
Z01A	Yes	Explain why steel bridges must be painted.	56	3.0	59	3.9	53	3.8
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	22	2.3	25	3.3	20	2.6
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	8	1.4	10	2.4	5	1.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Romania SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	72	1.4	74	1.5	69	1.6
B01	No	Identify hottest layer of the Earth.	70	1.9	73	2.2	68	2.2
B05	No	Use elevation/weather diagram to locate earth feature.	44	2.5	45	2.5	43	2.9
C07	No	Relate mountain shape to age.	58	2.2	61	2.6	55	2.6
D03	No	Identify direction of river flow on contour map.	28	2.1	28	2.5	28	2.7
E09	No	Use table of time/temperature to determine point when weather changes.	69	1.9	69	2.2	70	2.5
E12	No	Identify type of stone involved in cave formation.	65	1.9	66	2.5	63	2.3
F05	No	Relate level of oxygen to elevation.	70	1.8	71	2.5	70	2.0
G11	No	Identify type of rock from description of its formation.	46	2.1	44	2.7	47	2.4
H03	No	Select explanation for moonlight.	80	1.5	84	1.8	76	1.9
H04	No	Identify ground layer containing the most organic material.	67	1.8	70	1.7	65	2.5
I17	Yes	Know energy source for Earth’s water cycle.	26	2.7	26	3.3	25	3.6
J01	Yes	Know changes in Earth’s surface over billions of years.	40	2.5	39	3.5	41	3.4
K15	Yes	Know organic origins of fossil fuels.	71	2.7	64	4.0	78	3.2
O12	Yes	Know relative amounts of components in air.	40	2.9	39	3.6	41	4.1
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	37	3.0	41	3.7	34	3.7
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	65	2.5	66	3.3	64	3.6
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	23	2.4	27	3.4	20	3.1
Q16	Yes	Estimate time for light from star to reach Earth.	21	2.3	22	3.2	20	3.1
R04	Yes	Give reason why ozone layer is important for life.	41	3.0	46	4.1	35	3.1
W01A	Yes	Give reason region in land/water diagram is a good farming location.	68	2.3	69	2.8	68	2.7
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	33	2.5	33	3.0	32	3.1
W02	Yes	Draw diagram showing Earth’s water cycle.	21	2.0	23	2.7	20	2.2

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Romania SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	66	2.0	69	2.0	62	2.3
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	40	2.1	43	2.7	36	2.7
F04	No	Predict type of area where soil erosion by rain is most likely.	64	1.9	64	2.5	64	2.3
G12	No	Identify a nonrenewable natural resource.	48	2.2	49	2.4	48	2.8
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	27	2.5	25	2.9	29	3.5
I13	Yes	Select best scale for accurate measurement.	52	2.6	53	3.9	51	3.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	32	2.7	33	3.5	32	3.4
I18	Yes	Write conclusion from summary of experimental observations.	16	2.0	15	2.2	17	3.0
K19	Yes	Write an example of how computers are used to do work.	60	3.0	61	3.8	59	4.0
N01	Yes	Determine correct control experiment to test hypothesis.	35	2.7	37	3.8	33	3.7
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	53	2.9	51	3.8	54	3.6
N05	Yes	Identify a principal cause of acid rain.	26	2.4	25	3.3	27	2.9
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	54	2.7	53	3.5	55	3.3
Z02A	Yes	Write a reason why not all people have enough water.	32	2.8	34	3.6	30	3.7
Z02B	Yes	Write a second reason why not all people have enough water.	18	2.0	18	2.4	17	3.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Romania SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	78	1.7	77	2.1	79	1.7
B04	No	Predict pulse/breathing rate change after exercise.	83	1.2	84	1.6	82	1.5
C08	No	Identify carrier of signals from eye to brain.	72	1.9	72	2.5	72	2.3
D05	No	Identify system carrying sensory messages to the brain.	67	2.0	70	2.7	65	2.3
D06	No	Relate plant part to seed development.	85	1.2	85	1.6	85	1.5
E08	No	Select correct statement of trait heredity from parents.	82	1.4	79	1.9	85	1.6
E10	No	Determine characteristics for classifying animals.	36	2.0	37	2.3	34	2.8
F01	No	Identify characteristic of mammal.	74	1.8	73	2.1	75	2.1
F03	No	Identify human organ which interprets senses.	60	2.2	63	2.5	58	2.7
G08	No	Identify main function of red blood cells.	52	2.5	55	2.9	49	2.9
G09	No	Identify reproductive cells involved in heredity.	76	1.7	76	2.4	76	1.9
H01	No	Identify the functions of blood.	64	1.7	63	2.0	65	2.4
H02	No	Identify the role of vitamins.	68	1.9	69	2.3	68	2.4
I10	Yes	Identify nutrition content of fruits and vegetables.	78	2.4	74	3.8	83	2.9
I11	Yes	Know identifying features of insects.	33	2.7	36	4.1	30	3.5
I14	Yes	Relate elbow action to a simple machine.	40	2.7	39	3.5	41	3.8
I19	Yes	Identify statement of oxygen production consistent with data.	47	3.1	42	3.8	51	3.7
J02	Yes	Choose species on Earth for shortest time.	63	2.9	65	3.7	59	3.6
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	52	2.7	54	3.9	50	3.6
J09	Yes	Explain how to determine the age of a cut tree.	59	2.9	59	4.0	59	3.7
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	63	3.0	64	3.8	62	3.5
K12	Yes	Relate reproductive cell production to population.	55	2.8	55	3.7	55	4.1
K16	Yes	Identify common product made with bacteria.	36	3.2	29	4.0	42	4.0
K18	Yes	Identify main function of chloroplasts in plant cell.	48	3.0	48	4.1	48	3.9
L02	Yes	Select reason why algae are close to ocean surface.	53	3.2	54	3.9	51	4.4
L03	Yes	Identify skull features typical of predators.	69	2.4	73	3.1	64	3.5
L05	Yes	Select most likely purpose for birds' singing.	60	2.5	59	3.3	60	3.8
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	58	2.8	59	3.3	56	4.0
M11	Yes	Complete a food web showing energy relationships.	64	2.8	65	3.8	63	4.0
N02	Yes	Choose meal which would give the most nutrients.	15	1.8	15	2.8	15	2.3
N04	Yes	Identify how decaying fish fertilize plants.	49	2.7	50	3.6	48	4.0
N06	Yes	Identify the most basic unit of living things.	69	2.6	70	3.5	68	3.2
O16	Yes	Give reason for thirst on a hot day.	48	3.1	48	4.3	49	3.8
O17	Yes	Describe how disease may be transmitted.	60	3.1	56	4.1	62	3.7
P04	Yes	Identify what happens to animals' biological processes during hibernation.	62	2.8	63	3.8	61	3.6
P06	Yes	Describe digestion occuring in the mouth.	33	2.7	30	3.4	35	4.0
Q17	Yes	Describe the advantage of having two eyes.	28	2.8	28	3.7	27	3.7
R03	Yes	Give example of consequences of introducing new species.	22	2.3	24	3.5	20	2.6
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	9	1.6	9	2.0	8	1.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	62	2.1	61	2.8	64	2.8
X02B	Yes	Explain why light is important in aquarium ecosystem.	43	2.4	42	2.8	44	2.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Romania SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	37	2.2	38	2.3	37	2.4
A10	No	Relate light level and reflectance to vision of object.	67	1.6	68	1.6	65	2.0
B02	No	Know type of energy released from combustion engine.	57	2.1	55	2.5	59	2.3
B03	No	Determine density from mass/volume table.	29	2.2	30	2.5	28	2.4
B06	No	Relate color of object to amount of light reflection.	86	1.2	87	1.6	85	1.4
C09	No	Identify correct position of reflected image.	53	2.3	56	2.7	50	2.8
C12	No	Identify substance which is NOT a fossil fuel.	49	2.5	49	3.1	49	2.6
D01	No	Identify correct diagram of light rays through lens.	44	2.2	45	2.6	42	2.7
D02	No	Identify substance from magnetic properties.	84	1.5	85	2.0	83	1.8
D04	No	Relate physical event to its sequence of energy changes.	54	2.0	54	2.5	54	2.4
E07	No	Identify particles found in the nucleus of atoms.	71	2.1	67	2.6	74	2.5
E11	No	Find shadow size from diagram of bulb/card/screen distances.	60	2.0	62	2.4	57	2.5
F02	No	Relate color and light reflection to temperature of object.	59	2.2	65	2.7	53	2.4
G07	No	Identify correct way to place batteries in a flashlight.	88	1.2	91	1.4	85	1.9
H05	No	Identify source of energy stored in food.	12	1.4	14	2.0	11	1.6
I16	Yes	Identify material with greatest heat conductivity.	76	2.1	79	2.7	74	3.1
J05	Yes	Identify type of solar radiation that causes sunburn.	47	3.1	55	3.9	37	3.6
K10	Yes	Describe a method demonstrating the existence of air.	15	2.0	15	2.6	16	2.6
K13	Yes	Identify electrical conductors that form complete circuits.	69	2.6	72	3.3	66	3.6
K14	Yes	Relate evaporation rate to surface area.	74	2.3	74	3.2	76	3.1
K17	Yes	Relate presence of gravitational force to position of falling object.	50	2.6	51	3.5	49	4.0
L01	Yes	Select diagram showing forces resulting in rotation.	45	3.2	46	3.8	42	4.2
L04	Yes	Explain most efficient engine.	19	2.4	21	3.2	16	3.0
L07	Yes	Relate sound transmission to air.	53	2.8	55	3.9	50	3.7
M12	Yes	Complete table of voltage/current data for circuit.	47	2.9	53	4.1	43	3.6
M14	Yes	Draw reflected image of object.	51	2.9	52	4.1	51	3.5
N08	Yes	Relate lever arm lengths to balanced weights.	67	2.8	70	3.5	65	3.6
N10	Yes	Determine effect of tipping container on water surface.	45	2.9	55	3.9	36	3.4
O10	Yes	Identify polarity of ends of cut magnet.	59	2.9	61	4.0	57	3.6
O13	Yes	Relate circular motion to centripetal force.	50	2.9	53	3.9	48	3.6
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	67	2.6	70	3.5	63	3.4
P02	Yes	Explain relationship between illuminance and distance of light source.	15	2.3	17	3.6	14	2.4
P05	Yes	Explain why balloon expands upon heating.	54	3.0	58	3.8	49	4.1
Q12	Yes	Explain how focusing affects the amount of light.	37	2.7	42	4.0	33	3.2
Q13	Yes	Compare heat expansion properties of metal and glass.	54	3.1	53	3.8	54	3.7
Q18	Yes	Explain effect of melting on the mass of ice cubes.	14	1.8	17	3.0	12	2.1
R01	Yes	Choose diagram showing angle of reflected light.	76	1.9	79	2.7	73	3.0
R02	Yes	Identify reflection/absorption properties from color.	26	2.5	29	3.6	23	3.0
Y01	Yes	Explain amount of light/electric energy in a lamp.	7	1.3	7	1.3	7	1.9
Y02	Yes	Explain temperature of melting snowball.	10	1.6	10	1.9	10	1.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Russian Federation SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	85	1.2	86	1.5	83	1.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	80	1.8	79	1.9	81	2.1
F06	No	Relate rusting iron to the presence of oxygen and moisture.	79	1.8	80	2.0	79	2.3
G10	No	Select correct statement regarding the atomic makeup of matter.	68	1.8	72	1.8	65	3.0
H06	No	Know if wood-burning reaction absorbs or releases energy.	59	2.2	65	3.1	54	2.1
J03	Yes	Know relationship between molecules, atoms and cells.	53	3.6	58	5.0	47	3.6
J04	Yes	Distiguish between a chemical reaction and a physical change.	51	2.6	55	3.7	47	3.5
J06	Yes	Know what happens to atoms in animal after death.	21	2.6	24	3.8	19	2.9
J08	Yes	Identify gas involved in fire ignition.	76	2.3	79	3.4	72	2.2
M10	Yes	Identify substances which are mixtures.	50	3.1	52	3.5	49	5.3
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	56	3.6	58	4.3	55	5.8
N07	Yes	Explain oxygen fuel requirements of burning candle.	93	1.5	94	1.9	92	2.5
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	62	2.8	59	3.6	65	3.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	59	2.8	65	4.4	54	3.6
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	75	2.4	71	3.9	78	2.8
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	52	3.4	53	5.6	50	3.6
Q15	Yes	Determine physical processes involving chemical change.	31	4.6	34	6.4	28	4.4
R05	Yes	Explain how carbon dioxide fire extinguishers work.	54	3.2	63	4.6	46	4.2
Z01A	Yes	Explain why steel bridges must be painted.	51	3.4	57	5.1	45	3.8
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	37	3.1	39	5.4	36	3.6
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	12	2.2	12	2.8	12	3.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Russian Federation SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	82	1.1	84	1.6	81	1.0
B01	No	Identify hottest layer of the Earth.	91	1.2	91	1.6	91	1.3
B05	No	Use elevation/weather diagram to locate earth feature.	50	2.0	49	2.2	51	2.3
C07	No	Relate mountain shape to age.	55	2.1	60	2.0	51	2.8
D03	No	Identify direction of river flow on contour map.	42	2.0	48	2.6	36	2.4
E09	No	Use table of time/temperature to determine point when weather changes.	63	1.8	63	2.5	63	2.0
E12	No	Identify type of stone involved in cave formation.	44	1.9	45	2.1	43	2.6
F05	No	Relate level of oxygen to elevation.	84	1.2	87	1.3	82	1.5
G11	No	Identify type of rock from description of its formation.	61	2.1	57	2.6	64	2.9
H03	No	Select explanation for moonlight.	73	1.6	76	1.8	69	2.3
H04	No	Identify ground layer containing the most organic material.	72	1.6	75	1.9	69	1.9
I17	Yes	Know energy source for Earth’s water cycle.	47	2.9	52	3.8	42	3.8
J01	Yes	Know changes in Earth’s surface over billions of years.	55	3.0	50	4.2	60	3.0
K15	Yes	Know organic origins of fossil fuels.	62	3.3	66	3.3	58	4.9
O12	Yes	Know relative amounts of components in air.	27	3.4	31	3.4	24	4.4
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	62	2.7	74	3.9	52	3.2
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	82	3.1	79	4.4	85	2.8
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	51	2.5	50	3.3	51	3.7
Q16	Yes	Estimate time for light from star to reach Earth.	19	2.2	22	3.5	17	2.9
R04	Yes	Give reason why ozone layer is important for life.	39	3.3	40	4.8	37	4.2
W01A	Yes	Give reason region in land/water diagram is a good farming location.	74	1.6	75	2.1	73	2.9
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	39	2.3	41	2.7	38	2.8
W02	Yes	Draw diagram showing Earth’s water cycle.	59	2.0	64	2.7	55	3.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Russian Federation SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	64	1.4	67	1.4	61	2.0
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	33	1.8	35	1.8	30	2.5
F04	No	Predict type of area where soil erosion by rain is most likely.	81	1.4	80	1.9	82	1.6
G12	No	Identify a nonrenewable natural resource.	56	2.0	58	2.2	53	2.8
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	34	2.7	35	3.0	33	3.6
I13	Yes	Select best scale for accurate measurement.	76	2.3	76	3.1	77	2.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	50	3.1	46	4.6	54	3.5
I18	Yes	Write conclusion from summary of experimental observations.	32	3.6	30	3.8	33	4.4
K19	Yes	Write an example of how computers are used to do work.	70	3.0	73	3.9	68	4.2
N01	Yes	Determine correct control experiment to test hypothesis.	35	4.0	38	5.2	33	4.3
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	59	2.7	61	3.3	56	3.8
N05	Yes	Identify a principal cause of acid rain.	21	2.5	21	3.8	21	2.8
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	61	2.0	57	2.7	64	3.1
Z02A	Yes	Write a reason why not all people have enough water.	43	2.8	41	4.4	45	3.0
Z02B	Yes	Write a second reason why not all people have enough water.	29	2.3	25	2.6	33	3.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Russian Federation SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	80	1.4	78	1.9	81	1.7
B04	No	Predict pulse/breathing rate change after exercise.	90	1.0	90	1.2	89	1.8
C08	No	Identify carrier of signals from eye to brain.	76	1.9	75	2.5	78	1.9
D05	No	Identify system carrying sensory messages to the brain.	80	1.8	85	1.8	76	2.3
D06	No	Relate plant part to seed development.	89	1.1	90	1.5	89	1.3
E08	No	Select correct statement of trait heredity from parents.	84	1.7	82	1.8	86	2.0
E10	No	Determine characteristics for classifying animals.	45	2.6	45	2.8	45	3.3
F01	No	Identify characteristic of mammal.	75	1.8	70	2.3	80	1.9
F03	No	Identify human organ which interprets senses.	74	2.1	74	2.7	74	2.4
G08	No	Identify main function of red blood cells.	58	2.4	57	2.0	58	3.7
G09	No	Identify reproductive cells involved in heredity.	72	1.8	67	2.4	76	2.2
H01	No	Identify the functions of blood.	62	2.0	62	2.6	63	2.2
H02	No	Identify the role of vitamins.	91	1.0	89	1.4	92	1.2
I10	Yes	Identify nutrition content of fruits and vegetables.	93	1.1	91	1.8	95	1.3
I11	Yes	Know identifying features of insects.	53	2.2	56	3.4	51	3.3
I14	Yes	Relate elbow action to a simple machine.	70	2.0	64	3.2	76	2.8
J02	Yes	Choose species on Earth for shortest time.	78	2.0	77	3.0	80	2.1
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	42	2.9	41	3.9	43	3.7
J09	Yes	Explain how to determine the age of a cut tree.	89	1.6	89	2.3	90	2.3
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	68	2.4	70	3.1	67	3.9
K12	Yes	Relate reproductive cell production to population.	53	2.8	57	3.2	50	3.8
K16	Yes	Identify common product made with bacteria.	58	3.0	56	4.7	60	4.0
K18	Yes	Identify main function of chloroplasts in plant cell.	79	1.3	79	3.1	79	2.1
L02	Yes	Select reason why algae are close to ocean surface.	57	2.4	62	3.5	54	3.4
L03	Yes	Identify skull features typical of predators.	72	2.1	74	2.9	70	2.7
L05	Yes	Select most likely purpose for birds’ singing.	69	2.4	66	4.1	72	3.0
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	66	2.1	64	3.1	68	2.8
M11	Yes	Complete a food web showing energy relationships.	73	2.5	69	3.2	76	3.9
N02	Yes	Choose meal which would give the most nutrients.	23	2.3	18	2.6	28	3.4
N04	Yes	Identify how decaying fish fertilize plants.	67	2.5	70	3.2	63	3.6
N06	Yes	Identify the most basic unit of living things.	74	2.3	71	3.4	76	2.6
O16	Yes	Give reason for thirst on a hot day.	53	2.3	52	3.8	53	2.7
O17	Yes	Describe how disease may be transmitted.	57	2.6	51	5.1	62	4.0
P04	Yes	Identify what happens to animals’ biological processes during hibernation.	75	3.0	70	4.6	80	3.1
P06	Yes	Describe digestion occuring in the mouth.	47	2.8	45	4.3	49	3.5
Q17	Yes	Describe the advantage of having two eyes.	43	3.9	43	6.3	43	3.7
R03	Yes	Give example of consequences of introducing new species.	11	2.6	17	4.8	6	1.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	5	1.2	5	1.3	5	1.3
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	65	2.4	66	3.1	64	2.6
X02B	Yes	Explain why light is important in aquarium ecosystem.	41	2.6	44	3.2	39	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Russian Federation SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	64	2.1	63	2.2	65	2.3
A10	No	Relate light level and reflectance to vision of object.	50	2.6	54	3.1	47	2.6
B02	No	Know type of energy released from combustion engine.	70	1.8	68	1.9	72	2.2
B03	No	Determine density from mass/volume table.	35	1.6	35	2.2	34	2.1
B06	No	Relate color of object to amount of light reflection.	89	1.3	92	1.5	87	1.7
C09	No	Identify correct position of reflected image.	76	1.9	81	2.4	71	1.9
C12	No	Identify substance which is NOT a fossil fuel.	68	2.3	70	2.9	66	2.4
D01	No	Identify correct diagram of light rays through lens.	67	2.3	76	2.5	60	2.9
D02	No	Identify substance from magnetic properties.	86	1.4	89	1.7	83	1.8
D04	No	Relate physical event to its sequence of energy changes.	64	2.3	68	2.8	61	2.4
E07	No	Identify particles found in the nucleus of atoms.	64	2.4	58	3.2	68	2.4
E11	No	Find shadow size from diagram of bulb/card/screen distances.	66	1.9	66	3.0	65	2.9
F02	No	Relate color and light reflection to temperature of object.	80	1.5	84	1.8	76	2.0
G07	No	Identify correct way to place batteries in a flashlight.	89	1.1	96	0.8	83	1.8
H05	No	Identify source of energy stored in food.	20	1.9	20	2.0	20	2.2
I16	Yes	Identify material with greatest heat conductivity.	89	1.5	88	2.4	91	1.9
J05	Yes	Identify type of solar radiation that causes sunburn.	62	3.3	61	4.2	62	3.4
K10	Yes	Describe a method demonstrating the existence of air.	22	2.6	27	3.5	18	3.6
K13	Yes	Identify electrical conductors that form complete circuits.	74	2.3	85	2.5	66	3.3
K14	Yes	Relate evaporation rate to surface area.	92	1.5	92	2.4	93	1.8
K17	Yes	Relate presence of gravitational force to position of falling object.	42	2.4	50	3.8	37	3.5
L01	Yes	Select diagram showing forces resulting in rotation.	48	3.0	53	6.1	44	3.5
L04	Yes	Explain most efficient engine.	25	2.8	25	4.2	24	3.2
L07	Yes	Relate sound transmission to air.	69	2.4	69	4.8	69	2.7
M12	Yes	Complete table of voltage/current data for circuit.	56	2.2	60	3.3	52	3.0
M14	Yes	Draw reflected image of object.	80	3.4	84	2.8	77	5.4
N08	Yes	Relate lever arm lengths to balanced weights.	85	2.0	87	2.9	84	3.0
N10	Yes	Determine effect of tipping container on water surface.	51	3.7	60	4.8	42	4.4
O10	Yes	Identify polarity of ends of cut magnet.	70	2.3	72	3.4	69	2.9
O13	Yes	Relate circular motion to centripetal force.	64	3.2	74	3.8	55	3.8
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	83	2.4	83	3.2	84	2.8
P02	Yes	Explain relationship between illuminance and distance of light source.	10	1.6	9	2.8	11	2.6
P05	Yes	Explain why balloon expands upon heating.	56	3.7	61	4.9	51	3.9
Q12	Yes	Explain how focusing affects the amount of light.	34	2.4	39	3.3	29	4.1
Q13	Yes	Compare heat expansion properties of metal and glass.	71	3.1	70	4.6	71	3.5
Q18	Yes	Explain effect of melting on the mass of ice cubes.	25	2.7	29	4.7	21	2.6
R01	Yes	Choose diagram showing angle of reflected light.	76	2.1	77	3.7	76	1.9
R02	Yes	Identify reflection/absorption properties from color.	22	3.1	24	4.3	21	3.3
Y01	Yes	Explain amount of light/electric energy in a lamp.	14	1.6	16	3.2	13	2.0
Y02	Yes	Explain temperature of melting snowball.	18	1.5	20	2.4	16	1.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Singapore SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	91	0.7	92	0.7	89	1.0
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	82	1.2	82	1.7	83	1.6
F06	No	Relate rusting iron to the presence of oxygen and moisture.	86	1.3	89	1.5	83	1.6
G10	No	Select correct statement regarding the atomic makeup of matter.	72	1.6	76	2.2	69	2.1
H06	No	Know if wood-burning reaction absorbs or releases energy.	74	2.1	75	2.5	73	2.5
J03	Yes	Know relationship between molecules, atoms and cells.	66	2.6	65	3.5	66	3.3
J04	Yes	Distiguish between a chemical reaction and a physical change.	78	2.3	77	3.1	78	3.0
J06	Yes	Know what happens to atoms in animal after death.	32	2.4	34	3.3	30	3.2
J08	Yes	Identify gas involved in fire ignition.	72	2.1	73	2.9	71	2.8
M10	Yes	Identify substances which are mixtures.	65	2.1	66	2.7	65	3.2
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	69	2.2	72	2.6	67	3.2
N07	Yes	Explain oxygen fuel requirements of burning candle.	96	0.7	98	0.9	95	1.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	71	2.3	73	3.2	68	3.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	50	2.4	51	3.8	48	3.3
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	51	2.9	54	4.2	48	3.8
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	65	2.4	65	3.6	66	3.0
Q15	Yes	Determine physical processes involving chemical change.	62	2.1	60	3.1	64	2.9
R05	Yes	Explain how carbon dioxide fire extinguishers work.	70	2.3	74	3.0	65	3.3
Z01A	Yes	Explain why steel bridges must be painted.	84	1.7	83	2.4	85	2.1
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	55	3.0	55	4.1	54	3.9
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	51	2.9	51	4.6	51	3.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Singapore SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	60	1.9	62	2.4	58	2.4
B01	No	Identify hottest layer of the Earth.	84	1.3	88	1.4	79	1.7
B05	No	Use elevation/weather diagram to locate earth feature.	32	1.5	31	2.1	33	2.3
C07	No	Relate mountain shape to age.	30	1.9	29	2.3	32	2.7
D03	No	Identify direction of river flow on contour map.	44	2.0	51	2.8	37	2.5
E09	No	Use table of time/temperature to determine point when weather changes.	88	1.2	88	1.4	88	1.5
E12	No	Identify type of stone involved in cave formation.	63	1.7	67	1.9	57	2.3
F05	No	Relate level of oxygen to elevation.	96	0.6	97	0.7	95	0.8
G11	No	Identify type of rock from description of its formation.	62	1.9	62	2.4	63	2.6
H03	No	Select explanation for moonlight.	97	0.5	97	0.7	97	0.6
H04	No	Identify ground layer containing the most organic material.	45	1.5	48	2.4	41	1.7
I17	Yes	Know energy source for Earth’s water cycle.	68	2.3	72	3.0	64	3.2
J01	Yes	Know changes in Earth’s surface over billions of years.	42	2.8	41	3.3	44	4.2
K15	Yes	Know organic origins of fossil fuels.	85	1.6	88	2.2	81	2.2
O12	Yes	Know relative amounts of components in air.	58	3.1	60	4.3	55	3.7
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	65	2.5	69	3.1	61	3.5
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	96	1.0	95	1.4	96	1.2
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	50	2.1	51	3.0	49	3.0
Q16	Yes	Estimate time for light from star to reach Earth.	18	2.0	21	2.4	15	2.6
R04	Yes	Give reason why ozone layer is important for life.	78	2.4	80	3.2	76	2.8
W01A	Yes	Give reason region in land/water diagram is a good farming location.	94	0.8	93	1.1	94	1.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	62	1.9	64	2.7	59	2.4
W02	Yes	Draw diagram showing Earth’s water cycle.	57	2.4	59	2.8	55	2.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Singapore SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	86	0.9	87	1.3	86	1.1
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	73	1.6	77	2.1	67	2.5
F04	No	Predict type of area where soil erosion by rain is most likely.	94	0.8	93	1.0	94	1.0
G12	No	Identify a nonrenewable natural resource.	74	2.0	76	2.2	71	2.7
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	71	1.9	74	2.4	69	3.0
I13	Yes	Select best scale for accurate measurement.	80	2.3	78	3.0	81	2.7
I15	Yes	Identify the type of scientific statement given in an experimental report.	75	2.1	74	2.8	75	3.1
I18	Yes	Write conclusion from summary of experimental observations.	65	2.6	62	3.4	69	3.6
K19	Yes	Write an example of how computers are used to do work.	94	1.2	94	1.6	95	1.5
N01	Yes	Determine correct control experiment to test hypothesis.	71	1.8	68	2.6	74	3.0
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	80	1.8	80	2.4	79	2.8
N05	Yes	Identify a principal cause of acid rain.	31	2.3	31	3.1	31	3.0
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	65	2.2	66	3.2	64	3.1
Z02A	Yes	Write a reason why not all people have enough water.	85	1.7	82	2.8	87	2.1
Z02B	Yes	Write a second reason why not all people have enough water.	70	2.2	65	3.1	74	2.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Singapore SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	79	1.2	73	1.9	86	1.1
B04	No	Predict pulse/breathing rate change after exercise.	97	0.4	96	0.6	97	0.5
C08	No	Identify carrier of signals from eye to brain.	85	1.4	85	1.7	85	1.5
D05	No	Identify system carrying sensory messages to the brain.	81	1.3	81	1.5	81	1.7
D06	No	Relate plant part to seed development.	87	0.9	88	1.3	87	1.2
E08	No	Select correct statement of trait heredity from parents.	73	1.6	69	2.3	77	1.9
E10	No	Determine characteristics for classifying animals.	65	1.5	69	1.8	61	2.0
F01	No	Identify characteristic of mammal.	62	1.8	65	2.4	59	2.1
F03	No	Identify human organ which interprets senses.	84	1.3	84	1.6	83	1.8
G08	No	Identify main function of red blood cells.	89	0.9	90	1.3	88	1.5
G09	No	Identify reproductive cells involved in heredity.	78	1.2	77	1.5	79	1.7
H01	No	Identify the functions of blood.	74	1.4	76	1.8	72	1.7
H02	No	Identify the role of vitamins.	87	1.3	83	1.8	90	1.2
I10	Yes	Identify nutrition content of fruits and vegetables.	87	1.5	87	2.1	87	2.0
I11	Yes	Know identifying features of insects.	68	1.9	74	2.7	60	3.1
I14	Yes	Relate elbow action to a simple machine.	56	2.4	53	2.9	59	3.6
I19	Yes	Identify statement of oxygen production consistent with data.	67	2.4	65	3.5	70	3.0
J02	Yes	Choose species on Earth for shortest time.	53	2.6	57	3.6	48	3.6
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	64	2.5	62	3.6	66	3.2
J09	Yes	Explain how to determine the age of a cut tree.	59	2.7	73	3.0	42	3.7
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	91	1.4	91	1.7	91	1.9
K12	Yes	Relate reproductive cell production to population.	79	1.8	77	2.3	82	2.4
K16	Yes	Identify common product made with bacteria.	64	2.3	66	3.4	61	3.1
K18	Yes	Identify main function of chloroplasts in plant cell.	57	2.7	53	3.9	61	3.4
L02	Yes	Select reason why algae are close to ocean surface.	69	2.2	74	2.7	63	3.6
L03	Yes	Identify skull features typical of predators.	83	1.9	85	2.3	81	2.5
L05	Yes	Select most likely purpose for birds' singing.	51	2.1	56	2.6	45	3.1
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	72	2.2	77	2.6	67	3.1
M11	Yes	Complete a food web showing energy relationships.	94	1.3	94	2.2	93	1.5
N02	Yes	Choose meal which would give the most nutrients.	66	2.4	59	3.0	73	3.0
N04	Yes	Identify how decaying fish fertilize plants.	88	1.2	87	1.6	89	1.6
N06	Yes	Identify the most basic unit of living things.	81	2.0	82	2.8	80	2.6
O16	Yes	Give reason for thirst on a hot day.	92	1.2	92	1.9	92	1.4
O17	Yes	Describe how disease may be transmitted.	73	2.3	70	2.9	76	2.9
P04	Yes	Identify what happens to animals' biological processes during hibernation.	44	3.1	47	3.8	39	3.9
P06	Yes	Describe digestion occuring in the mouth.	38	2.4	37	3.1	39	3.3
Q17	Yes	Describe the advantage of having two eyes.	89	1.4	89	1.8	89	2.2
R03	Yes	Give example of consequences of introducing new species.	26	2.2	28	3.0	24	2.9
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	32	1.8	29	2.2	35	2.6
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	96	0.7	96	0.9	96	0.8
X02B	Yes	Explain why light is important in aquarium ecosystem.	78	2.0	77	2.7	79	2.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Singapore SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	78	0.8	77	0.8	79	1.4
A10	No	Relate light level and reflectance to vision of object.	89	0.9	90	1.0	88	1.2
B02	No	Know type of energy released from combustion engine.	58	1.4	56	1.8	60	1.9
B03	No	Determine density from mass/volume table.	49	2.0	54	2.6	45	2.4
B06	No	Relate color of object to amount of light reflection.	94	0.6	94	0.8	94	0.9
C09	No	Identify correct position of reflected image.	89	1.3	89	1.7	89	1.5
C12	No	Identify substance which is NOT a fossil fuel.	63	1.8	64	2.2	62	2.2
D01	No	Identify correct diagram of light rays through lens.	52	1.8	58	2.2	45	2.2
D02	No	Identify substance from magnetic properties.	91	0.8	90	1.3	92	0.9
D04	No	Relate physical event to its sequence of energy changes.	82	1.0	82	1.3	82	1.6
E07	No	Identify particles found in the nucleus of atoms.	45	2.3	47	3.1	42	3.0
E11	No	Find shadow size from diagram of bulb/card/screen distances.	65	1.5	69	2.2	61	1.7
F02	No	Relate color and light reflection to temperature of object.	87	1.3	90	1.4	84	2.0
G07	No	Identify correct way to place batteries in a flashlight.	96	0.4	97	0.6	96	0.7
H05	No	Identify source of energy stored in food.	72	2.0	72	2.4	72	2.4
I16	Yes	Identify material with greatest heat conductivity.	98	0.7	98	0.7	98	1.3
J05	Yes	Identify type of solar radiation that causes sunburn.	82	1.9	84	2.5	80	2.8
K10	Yes	Describe a method demonstrating the existence of air.	51	2.4	54	3.5	49	3.1
K13	Yes	Identify electrical conductors that form complete circuits.	97	0.8	98	0.8	96	1.1
K14	Yes	Relate evaporation rate to surface area.	98	0.6	98	0.9	99	0.5
K17	Yes	Relate presence of gravitational force to position of falling object.	59	2.4	64	3.1	54	3.3
L01	Yes	Select diagram showing forces resulting in rotation.	59	2.3	64	2.8	53	3.2
L04	Yes	Explain most efficient engine.	48	2.7	47	3.8	50	3.5
L07	Yes	Relate sound transmission to air.	86	1.9	90	2.1	81	2.9
M12	Yes	Complete table of voltage/current data for circuit.	81	2.0	87	1.8	76	3.5
M14	Yes	Draw reflected image of object.	85	1.1	87	1.9	84	1.9
N08	Yes	Relate lever arm lengths to balanced weights.	83	1.9	86	2.2	79	2.9
N10	Yes	Determine effect of tipping container on water surface.	76	2.2	83	2.7	68	3.3
O10	Yes	Identify polarity of ends of cut magnet.	81	1.7	81	2.4	80	2.4
O13	Yes	Relate circular motion to centripetal force.	68	1.9	70	2.9	66	2.5
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	96	1.0	95	1.5	97	1.0
P02	Yes	Explain relationship between illuminance and distance of light source.	28	2.4	31	4.1	24	2.6
P05	Yes	Explain why balloon expands upon heating.	58	2.8	59	3.8	56	3.4
Q12	Yes	Explain how focusing affects the amount of light.	46	2.4	49	2.9	43	3.3
Q13	Yes	Compare heat expansion properties of metal and glass.	87	1.6	87	2.2	88	2.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	33	2.1	32	3.4	35	2.9
R01	Yes	Choose diagram showing angle of reflected light.	92	1.1	94	1.3	90	1.8
R02	Yes	Identify reflection/absorption properties from color.	69	2.2	69	3.3	69	2.7
Y01	Yes	Explain amount of light/electric energy in a lamp.	19	2.5	20	3.3	18	3.1
Y02	Yes	Explain temperature of melting snowball.	18	1.8	21	1.9	15	2.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=South Africa SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	40	1.7	42	2.5	38	1.8
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	57	1.8	59	2.7	56	2.3
F06	No	Relate rusting iron to the presence of oxygen and moisture.	29	1.9	30	2.9	27	2.1
G10	No	Select correct statement regarding the atomic makeup of matter.	43	1.5	43	1.8	43	2.0
H06	No	Know if wood-burning reaction absorbs or releases energy.	22	2.1	26	3.0	17	1.7
J03	Yes	Know relationship between molecules, atoms and cells.	7	1.6	9	2.7	6	1.6
J04	Yes	Distiguish between a chemical reaction and a physical change.	36	2.3	33	2.7	38	3.2
J06	Yes	Know what happens to atoms in animal after death.	21	2.6	25	3.6	18	3.1
J08	Yes	Identify gas involved in fire ignition.	39	2.9	46	4.0	33	4.2
M10	Yes	Identify substances which are mixtures.	23	2.3	22	3.7	23	2.8
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	19	2.0	21	3.1	17	2.8
N07	Yes	Explain oxygen fuel requirements of burning candle.	35	3.3	34	4.6	34	3.3
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	34	3.5	32	5.2	36	3.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	29	2.5	33	3.8	25	3.5
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	13	1.7	14	2.2	11	2.7
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	41	2.4	42	3.7	41	3.9
Q15	Yes	Determine physical processes involving chemical change.	26	2.1	25	3.4	27	3.1
R05	Yes	Explain how carbon dioxide fire extinguishers work.	15	2.9	16	4.3	14	3.4
Z01A	Yes	Explain why steel bridges must be painted.	16	2.9	17	4.8	15	3.0
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	4	1.7	3	2.2	5	2.2
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	3	1.2	3	1.7	4	1.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=South Africa SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	29	1.4	31	1.9	27	1.5
B01	No	Identify hottest layer of the Earth.	62	1.5	63	2.2	62	1.7
B05	No	Use elevation/weather diagram to locate earth feature.	34	1.9	33	2.5	36	2.4
C07	No	Relate mountain shape to age.	14	1.3	16	1.8	13	1.7
D03	No	Identify direction of river flow on contour map.	24	1.1	26	1.8	21	1.6
E09	No	Use table of time/temperature to determine point when weather changes.	28	2.6	31	3.8	24	2.7
E12	No	Identify type of stone involved in cave formation.	25	1.1	28	1.9	23	1.5
F05	No	Relate level of oxygen to elevation.	43	2.5	50	3.6	36	2.3
G11	No	Identify type of rock from description of its formation.	25	1.4	23	1.7	26	1.7
H03	No	Select explanation for moonlight.	58	1.9	59	2.4	57	2.3
H04	No	Identify ground layer containing the most organic material.	33	1.5	37	2.4	28	1.8
I17	Yes	Know energy source for Earth’s water cycle.	28	2.5	29	4.3	27	3.1
J01	Yes	Know changes in Earth’s surface over billions of years.	19	1.9	24	3.0	15	2.0
K15	Yes	Know organic origins of fossil fuels.	24	2.4	22	3.3	24	3.2
O12	Yes	Know relative amounts of components in air.	11	1.5	12	2.3	9	1.8
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	9	2.7	11	3.9	7	2.5
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	26	3.3	27	4.4	25	4.4
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	26	2.5	27	3.6	25	2.8
Q16	Yes	Estimate time for light from star to reach Earth.	24	2.2	24	3.5	22	3.0
R04	Yes	Give reason why ozone layer is important for life.	6	1.8	6	2.9	6	2.1
W01A	Yes	Give reason region in land/water diagram is a good farming location.	38	2.5	40	3.3	37	2.5
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	14	2.0	18	3.7	10	2.6
W02	Yes	Draw diagram showing Earth’s water cycle.	6	1.2	7	1.6	6	1.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=South Africa SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	51	1.9	56	2.0	47	2.2
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	29	1.6	33	1.9	25	1.8
F04	No	Predict type of area where soil erosion by rain is most likely.	31	2.7	36	3.9	26	2.5
G12	No	Identify a nonrenewable natural resource.	30	1.6	37	2.4	24	2.0
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	23	2.0	23	2.7	22	2.6
I13	Yes	Select best scale for accurate measurement.	26	2.4	26	3.4	26	3.1
I15	Yes	Identify the type of scientific statement given in an experimental report.	26	3.1	30	4.5	21	3.9
I18	Yes	Write conclusion from summary of experimental observations.	8	2.1	6	2.5	8	2.5
K19	Yes	Write an example of how computers are used to do work.	31	3.3	30	4.5	32	3.9
N01	Yes	Determine correct control experiment to test hypothesis.	33	2.2	30	3.3	35	3.3
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	25	3.1	24	4.7	25	3.8
N05	Yes	Identify a principal cause of acid rain.	22	2.1	25	4.0	19	3.2
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	23	2.1	20	3.0	26	2.8
Z02A	Yes	Write a reason why not all people have enough water.	16	3.1	18	5.1	14	3.8
Z02B	Yes	Write a second reason why not all people have enough water.	10	2.3	10	3.0	11	3.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=South Africa SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	30	1.8	31	2.6	29	1.9
B04	No	Predict pulse/breathing rate change after exercise.	40	2.3	43	2.9	37	2.7
C08	No	Identify carrier of signals from eye to brain.	36	2.4	40	2.9	33	2.5
D05	No	Identify system carrying sensory messages to the brain.	36	2.1	39	3.0	32	2.1
D06	No	Relate plant part to seed development.	38	2.0	44	3.0	31	2.0
E08	No	Select correct statement of trait heredity from parents.	48	1.4	47	1.8	50	1.8
E10	No	Determine characteristics for classifying animals.	21	1.6	22	2.3	20	2.0
F01	No	Identify characteristic of mammal.	58	1.8	61	2.4	55	2.2
F03	No	Identify human organ which interprets senses.	34	2.4	38	3.6	31	2.4
G08	No	Identify main function of red blood cells.	35	1.5	32	2.5	37	2.1
G09	No	Identify reproductive cells involved in heredity.	45	1.5	44	2.1	47	2.1
H01	No	Identify the functions of blood.	39	2.0	40	2.6	38	2.4
H02	No	Identify the role of vitamins.	34	2.6	34	2.9	33	3.0
I10	Yes	Identify nutrition content of fruits and vegetables.	54	2.8	54	3.4	53	3.5
I11	Yes	Know identifying features of insects.	27	2.5	30	2.8	24	3.8
I14	Yes	Relate elbow action to a simple machine.	28	2.9	26	3.2	29	3.8
I19	Yes	Identify statement of oxygen production consistent with data.	20	2.1	21	3.4	18	3.0
J02	Yes	Choose species on Earth for shortest time.	30	2.5	35	3.1	26	3.1
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	22	2.4	27	3.9	18	2.5
J09	Yes	Explain how to determine the age of a cut tree.	17	2.9	26	5.6	9	2.5
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	41	2.2	40	3.4	42	3.1
K12	Yes	Relate reproductive cell production to population.	27	2.5	28	4.2	26	3.1
K16	Yes	Identify common product made with bacteria.	25	2.2	21	2.8	29	2.8
K18	Yes	Identify main function of chloroplasts in plant cell.	30	2.4	34	3.2	28	3.4
L02	Yes	Select reason why algae are close to ocean surface.	22	2.0	23	2.3	22	3.0
L03	Yes	Identify skull features typical of predators.	31	2.6	36	4.0	28	3.1
L05	Yes	Select most likely purpose for birds' singing.	31	2.0	29	2.8	32	2.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	30	2.2	31	3.5	28	2.5
M11	Yes	Complete a food web showing energy relationships.	18	3.1	22	5.1	14	2.6
N02	Yes	Choose meal which would give the most nutrients.	20	2.2	20	2.9	19	3.0
N04	Yes	Identify how decaying fish fertilize plants.	24	2.6	26	3.6	21	2.5
N06	Yes	Identify the most basic unit of living things.	34	2.2	34	3.2	35	2.9
O16	Yes	Give reason for thirst on a hot day.	12	2.9	15	4.6	9	3.1
O17	Yes	Describe how disease may be transmitted.	12	2.5	12	3.5	12	3.1
P04	Yes	Identify what happens to animals' biological processes during hibernation.	16	2.1	18	3.1	16	3.2
P06	Yes	Describe digestion occuring in the mouth.	10	2.5	13	4.1	8	2.6
Q17	Yes	Describe the advantage of having two eyes.	19	3.1	23	5.0	15	3.1
R03	Yes	Give example of consequences of introducing new species.	4	1.4	5	2.1	4	1.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	5	1.4	7	2.3	3	1.0
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	34	2.8	40	4.2	27	2.5
X02B	Yes	Explain why light is important in aquarium ecosystem.	9	1.7	10	2.2	8	2.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=South Africa SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	44	1.5	49	1.9	39	1.9
A10	No	Relate light level and reflectance to vision of object.	37	2.1	40	3.0	34	2.1
B02	No	Know type of energy released from combustion engine.	40	1.5	41	2.2	39	2.1
B03	No	Determine density from mass/volume table.	18	1.3	18	1.8	20	1.5
B06	No	Relate color of object to amount of light reflection.	71	1.5	74	1.5	68	2.4
C09	No	Identify correct position of reflected image.	29	2.0	34	3.2	25	1.8
C12	No	Identify substance which is NOT a fossil fuel.	31	1.6	35	2.4	27	1.9
D01	No	Identify correct diagram of light rays through lens.	20	1.7	26	2.9	13	1.4
D02	No	Identify substance from magnetic properties.	49	2.5	52	3.6	46	2.1
D04	No	Relate physical event to its sequence of energy changes.	24	2.0	28	2.9	21	2.4
E07	No	Identify particles found in the nucleus of atoms.	27	1.3	27	2.0	27	1.8
E11	No	Find shadow size from diagram of bulb/card/screen distances.	57	1.3	54	2.0	59	2.2
F02	No	Relate color and light reflection to temperature of object.	22	2.4	25	3.8	20	2.1
G07	No	Identify correct way to place batteries in a flashlight.	62	2.0	73	2.0	52	2.8
H05	No	Identify source of energy stored in food.	19	2.0	20	2.7	18	2.1
I16	Yes	Identify material with greatest heat conductivity.	42	2.5	41	3.8	43	2.9
J05	Yes	Identify type of solar radiation that causes sunburn.	22	2.7	29	4.6	15	2.8
K10	Yes	Describe a method demonstrating the existence of air.	13	1.8	15	3.1	10	2.5
K13	Yes	Identify electrical conductors that form complete circuits.	42	3.2	52	4.3	33	3.4
K14	Yes	Relate evaporation rate to surface area.	46	3.1	49	4.9	43	2.8
K17	Yes	Relate presence of gravitational force to position of falling object.	36	2.5	35	4.0	36	2.9
L01	Yes	Select diagram showing forces resulting in rotation.	19	1.9	17	3.0	21	2.6
L04	Yes	Explain most efficient engine.	8	1.8	7	2.4	8	2.0
L07	Yes	Relate sound transmission to air.	32	2.6	35	4.9	28	3.3
M12	Yes	Complete table of voltage/current data for circuit.	10	2.1	12	3.1	8	2.2
M14	Yes	Draw reflected image of object.	21	3.3	23	4.5	20	3.5
N08	Yes	Relate lever arm lengths to balanced weights.	35	2.6	33	3.3	36	3.3
N10	Yes	Determine effect of tipping container on water surface.	16	2.4	16	3.1	15	2.8
O10	Yes	Identify polarity of ends of cut magnet.	13	2.7	16	3.6	10	2.6
O13	Yes	Relate circular motion to centripetal force.	23	2.7	25	3.5	23	3.6
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	59	2.8	61	4.1	57	3.8
P02	Yes	Explain relationship between illuminance and distance of light source.	4	1.2	4	1.5	4	1.6
P05	Yes	Explain why balloon expands upon heating.	17	2.6	20	3.8	14	3.0
Q12	Yes	Explain how focusing affects the amount of light.	17	2.9	19	4.2	15	3.3
Q13	Yes	Compare heat expansion properties of metal and glass.	29	3.0	30	4.6	28	3.9
Q18	Yes	Explain effect of melting on the mass of ice cubes.	5	1.6	7	3.0	3	1.5
R01	Yes	Choose diagram showing angle of reflected light.	36	2.7	36	3.7	36	3.8
R02	Yes	Identify reflection/absorption properties from color.	25	2.3	27	2.9	24	2.9
Y01	Yes	Explain amount of light/electric energy in a lamp.	2	0.6	2	0.7	2	0.9
Y02	Yes	Explain temperature of melting snowball.	4	0.9	3	0.9	5	1.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Spain SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	79	0.9	84	1.2	73	1.5
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	78	1.2	78	1.9	78	1.5
F06	No	Relate rusting iron to the presence of oxygen and moisture.	78	1.3	80	1.6	76	1.7
G10	No	Select correct statement regarding the atomic makeup of matter.	57	1.7	61	2.4	52	2.0
H06	No	Know if wood-burning reaction absorbs or releases energy.	62	1.6	69	2.0	55	2.2
J03	Yes	Know relationship between molecules, atoms and cells.	41	2.2	40	3.6	42	2.7
J04	Yes	Distiguish between a chemical reaction and a physical change.	43	2.9	48	3.7	40	3.7
J06	Yes	Know what happens to atoms in animal after death.	23	2.2	20	2.9	25	3.3
J08	Yes	Identify gas involved in fire ignition.	38	2.5	44	3.6	34	3.2
M10	Yes	Identify substances which are mixtures.	32	2.5	34	3.1	30	3.3
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	72	2.5	72	3.3	73	3.3
N07	Yes	Explain oxygen fuel requirements of burning candle.	89	1.7	93	1.8	84	2.8
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	43	2.9	44	3.6	42	3.8
O11	Yes	Identify which change in elemental form is due to a chemical change.	30	2.4	38	3.5	24	3.1
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	70	2.3	72	3.4	68	2.9
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	59	2.9	54	4.1	64	3.8
Q15	Yes	Determine physical processes involving chemical change.	17	2.2	17	2.8	17	3.0
R05	Yes	Explain how carbon dioxide fire extinguishers work.	43	2.9	49	4.1	37	3.6
Z01A	Yes	Explain why steel bridges must be painted.	67	2.2	71	3.3	63	3.7
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	35	2.3	34	2.9	36	3.5
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	22	2.0	21	2.8	24	2.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Spain SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	67	0.9	70	1.3	64	1.4
B01	No	Identify hottest layer of the Earth.	90	1.0	93	1.1	87	1.3
B05	No	Use elevation/weather diagram to locate earth feature.	43	1.5	44	1.9	43	1.9
C07	No	Relate mountain shape to age.	58	1.8	60	2.3	57	2.5
D03	No	Identify direction of river flow on contour map.	23	1.2	30	1.8	17	1.4
E09	No	Use table of time/temperature to determine point when weather changes.	87	1.0	88	1.4	86	1.4
E12	No	Identify type of stone involved in cave formation.	54	1.6	56	2.1	51	2.1
F05	No	Relate level of oxygen to elevation.	83	1.1	83	1.4	82	1.5
G11	No	Identify type of rock from description of its formation.	46	1.4	44	1.9	48	2.3
H03	No	Select explanation for moonlight.	84	1.2	89	1.3	78	1.9
H04	No	Identify ground layer containing the most organic material.	53	1.5	59	2.0	46	2.1
I17	Yes	Know energy source for Earth’s water cycle.	40	2.5	41	3.8	38	3.5
J01	Yes	Know changes in Earth’s surface over billions of years.	49	2.5	47	3.4	51	3.6
K15	Yes	Know organic origins of fossil fuels.	73	2.2	78	2.8	68	3.3
O12	Yes	Know relative amounts of components in air.	9	1.5	11	2.2	8	2.0
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	64	2.2	72	2.9	56	3.3
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	89	1.4	88	2.1	89	2.1
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	45	2.5	53	3.5	36	3.2
Q16	Yes	Estimate time for light from star to reach Earth.	33	2.5	37	3.5	29	3.0
R04	Yes	Give reason why ozone layer is important for life.	68	2.4	73	3.1	63	3.9
W01A	Yes	Give reason region in land/water diagram is a good farming location.	87	1.2	85	1.8	89	1.4
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	35	1.8	34	2.5	35	2.6
W02	Yes	Draw diagram showing Earth’s water cycle.	34	1.8	35	2.5	33	2.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Spain SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	58	1.4	62	1.7	54	1.8
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	49	1.4	53	2.3	45	1.9
F04	No	Predict type of area where soil erosion by rain is most likely.	73	1.3	76	1.9	70	1.6
G12	No	Identify a nonrenewable natural resource.	57	1.6	62	2.1	51	2.0
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	27	2.4	26	3.2	28	3.2
I13	Yes	Select best scale for accurate measurement.	67	2.5	66	3.8	68	3.1
I15	Yes	Identify the type of scientific statement given in an experimental report.	40	2.2	41	3.6	39	2.7
I18	Yes	Write conclusion from summary of experimental observations.	39	3.0	39	4.4	40	3.2
K19	Yes	Write an example of how computers are used to do work.	75	2.3	75	3.3	76	2.8
N01	Yes	Determine correct control experiment to test hypothesis.	49	2.7	49	3.3	49	4.1
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	60	2.8	61	3.5	59	3.8
N05	Yes	Identify a principal cause of acid rain.	34	2.5	36	3.2	33	4.0
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	28	2.3	26	3.5	31	3.4
Z02A	Yes	Write a reason why not all people have enough water.	82	1.7	79	2.6	85	2.7
Z02B	Yes	Write a second reason why not all people have enough water.	57	2.5	50	3.5	66	3.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Spain SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	72	1.0	72	1.3	72	1.3
B04	No	Predict pulse/breathing rate change after exercise.	94	0.6	94	1.0	94	0.7
C08	No	Identify carrier of signals from eye to brain.	80	1.4	82	1.7	78	1.9
D05	No	Identify system carrying sensory messages to the brain.	66	1.4	71	1.9	61	1.8
D06	No	Relate plant part to seed development.	56	1.4	60	1.9	52	2.2
E08	No	Select correct statement of trait heredity from parents.	92	0.7	90	1.2	94	0.8
E10	No	Determine characteristics for classifying animals.	51	1.8	54	2.3	48	2.3
F01	No	Identify characteristic of mammal.	68	1.7	70	2.2	66	2.1
F03	No	Identify human organ which interprets senses.	78	1.4	78	1.7	78	1.8
G08	No	Identify main function of red blood cells.	82	1.1	87	1.5	77	1.8
G09	No	Identify reproductive cells involved in heredity.	88	0.8	87	1.2	89	1.3
H01	No	Identify the functions of blood.	60	1.5	60	2.0	59	1.9
H02	No	Identify the role of vitamins.	79	1.2	79	1.5	80	1.6
I10	Yes	Identify nutrition content of fruits and vegetables.	61	2.5	66	3.4	57	3.6
I11	Yes	Know identifying features of insects.	30	2.1	33	2.8	27	3.3
I14	Yes	Relate elbow action to a simple machine.	55	2.2	55	3.6	55	3.4
I19	Yes	Identify statement of oxygen production consistent with data.	53	2.4	53	3.4	52	3.2
J02	Yes	Choose species on Earth for shortest time.	53	2.0	60	3.2	48	3.0
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	56	2.1	59	2.8	54	2.8
J09	Yes	Explain how to determine the age of a cut tree.	73	1.9	78	2.9	68	3.1
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	62	2.5	59	3.4	64	3.6
K12	Yes	Relate reproductive cell production to population.	50	2.8	49	3.5	52	3.7
K16	Yes	Identify common product made with bacteria.	41	2.6	46	3.1	37	3.5
K18	Yes	Identify main function of chloroplasts in plant cell.	54	2.4	56	3.4	53	3.2
L02	Yes	Select reason why algae are close to ocean surface.	53	2.6	62	3.8	44	3.6
L03	Yes	Identify skull features typical of predators.	68	2.4	71	3.3	64	3.1
L05	Yes	Select most likely purpose for birds' singing.	72	2.2	71	3.1	72	3.0
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	55	2.7	55	3.8	55	3.3
M11	Yes	Complete a food web showing energy relationships.	52	2.5	56	3.7	48	3.6
N02	Yes	Choose meal which would give the most nutrients.	27	2.5	23	3.0	32	3.5
N04	Yes	Identify how decaying fish fertilize plants.	46	2.6	53	3.1	38	3.6
N06	Yes	Identify the most basic unit of living things.	64	2.8	67	3.3	61	4.2
O16	Yes	Give reason for thirst on a hot day.	60	2.5	67	3.2	53	3.5
O17	Yes	Describe how disease may be transmitted.	52	2.7	49	3.4	55	3.6
P04	Yes	Identify what happens to animals' biological processes during hibernation.	47	2.7	50	4.2	44	3.6
P06	Yes	Describe digestion occuring in the mouth.	62	3.0	61	4.0	62	4.0
Q17	Yes	Describe the advantage of having two eyes.	68	2.5	70	3.6	66	3.2
R03	Yes	Give example of consequences of introducing new species.	14	1.8	16	2.5	12	2.3
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	10	1.1	11	1.6	8	1.3
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	57	2.1	58	2.4	56	3.0
X02B	Yes	Explain why light is important in aquarium ecosystem.	35	1.9	38	2.3	32	2.4

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Spain SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	69	1.0	70	1.2	68	1.3
A10	No	Relate light level and reflectance to vision of object.	74	0.9	74	1.1	74	1.3
B02	No	Know type of energy released from combustion engine.	56	1.4	55	2.2	57	1.7
B03	No	Determine density from mass/volume table.	14	1.2	15	1.5	14	1.4
B06	No	Relate color of object to amount of light reflection.	87	0.8	85	1.4	89	1.0
C09	No	Identify correct position of reflected image.	72	1.2	76	1.5	67	2.0
C12	No	Identify substance which is NOT a fossil fuel.	53	1.5	56	2.2	51	2.0
D01	No	Identify correct diagram of light rays through lens.	39	1.8	49	2.3	29	2.0
D02	No	Identify substance from magnetic properties.	77	1.3	79	1.8	76	1.9
D04	No	Relate physical event to its sequence of energy changes.	58	1.5	64	2.4	52	1.9
E07	No	Identify particles found in the nucleus of atoms.	63	1.7	63	2.1	64	2.2
E11	No	Find shadow size from diagram of bulb/card/screen distances.	59	1.6	63	2.2	55	2.2
F02	No	Relate color and light reflection to temperature of object.	55	1.5	59	1.9	51	2.1
G07	No	Identify correct way to place batteries in a flashlight.	91	0.9	93	1.2	89	1.3
H05	No	Identify source of energy stored in food.	14	1.1	14	1.4	14	1.5
I16	Yes	Identify material with greatest heat conductivity.	86	1.9	88	2.6	84	2.7
J05	Yes	Identify type of solar radiation that causes sunburn.	74	2.1	78	2.8	70	3.2
K10	Yes	Describe a method demonstrating the existence of air.	49	2.6	51	3.5	48	3.7
K13	Yes	Identify electrical conductors that form complete circuits.	82	1.8	85	2.2	79	2.9
K14	Yes	Relate evaporation rate to surface area.	79	2.2	79	2.7	79	3.0
K17	Yes	Relate presence of gravitational force to position of falling object.	55	2.4	58	3.2	52	3.3
L01	Yes	Select diagram showing forces resulting in rotation.	52	2.7	57	4.0	46	3.7
L04	Yes	Explain most efficient engine.	24	2.1	29	3.0	18	2.8
L07	Yes	Relate sound transmission to air.	69	2.8	76	2.9	61	4.2
M12	Yes	Complete table of voltage/current data for circuit.	39	2.7	47	3.5	31	2.8
M14	Yes	Draw reflected image of object.	66	2.2	66	3.2	65	3.3
N08	Yes	Relate lever arm lengths to balanced weights.	71	2.2	75	2.9	66	3.2
N10	Yes	Determine effect of tipping container on water surface.	48	2.5	56	3.3	38	3.6
O10	Yes	Identify polarity of ends of cut magnet.	70	2.6	71	3.8	69	3.3
O13	Yes	Relate circular motion to centripetal force.	63	2.4	71	3.6	55	3.2
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	85	1.7	87	2.1	82	2.7
P02	Yes	Explain relationship between illuminance and distance of light source.	20	2.2	23	3.0	18	3.3
P05	Yes	Explain why balloon expands upon heating.	67	2.4	71	3.2	62	3.3
Q12	Yes	Explain how focusing affects the amount of light.	54	2.5	61	3.6	48	3.7
Q13	Yes	Compare heat expansion properties of metal and glass.	47	2.5	47	3.5	46	3.5
Q18	Yes	Explain effect of melting on the mass of ice cubes.	32	2.7	35	3.3	29	3.8
R01	Yes	Choose diagram showing angle of reflected light.	69	2.6	73	3.2	65	3.7
R02	Yes	Identify reflection/absorption properties from color.	39	2.5	40	3.3	38	3.5
Y01	Yes	Explain amount of light/electric energy in a lamp.	3	0.5	3	0.7	2	0.7
Y02	Yes	Explain temperature of melting snowball.	10	1.0	10	1.5	11	1.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Sweden SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	89	0.7	90	0.9	88	0.9
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	82	1.1	82	1.4	82	1.5
F06	No	Relate rusting iron to the presence of oxygen and moisture.	78	1.3	81	1.8	76	1.7
G10	No	Select correct statement regarding the atomic makeup of matter.	64	1.6	70	2.0	59	2.2
H06	No	Know if wood-burning reaction absorbs or releases energy.	47	1.6	54	2.2	39	2.1
J03	Yes	Know relationship between molecules, atoms and cells.	39	2.6	43	3.4	34	3.0
J04	Yes	Distiguish between a chemical reaction and a physical change.	36	2.2	40	3.2	33	3.1
J06	Yes	Know what happens to atoms in animal after death.	26	1.8	31	2.9	21	2.7
J08	Yes	Identify gas involved in fire ignition.	69	2.0	73	3.0	65	2.9
M10	Yes	Identify substances which are mixtures.	58	2.3	58	3.2	57	3.1
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	53	2.6	66	3.2	42	3.7
N07	Yes	Explain oxygen fuel requirements of burning candle.	97	0.9	97	1.4	97	1.0
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	41	2.1	41	3.0	41	2.8
O11	Yes	Identify which change in elemental form is due to a chemical change.	25	2.1	27	3.0	22	3.1
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	44	3.1	42	3.8	45	3.7
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	40	2.7	43	3.8	36	3.5
Q15	Yes	Determine physical processes involving chemical change.	22	1.9	27	2.8	18	2.4
R05	Yes	Explain how carbon dioxide fire extinguishers work.	70	2.3	76	3.0	64	3.3
Z01A	Yes	Explain why steel bridges must be painted.	73	2.5	79	3.0	67	3.1
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	70	2.2	73	3.0	67	2.8
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	49	2.2	49	3.3	49	3.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Sweden SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	66	1.1	66	1.2	66	1.3
B01	No	Identify hottest layer of the Earth.	95	0.6	97	0.7	94	0.9
B05	No	Use elevation/weather diagram to locate earth feature.	55	1.3	56	2.0	55	1.6
C07	No	Relate mountain shape to age.	62	1.8	65	2.1	60	2.3
D03	No	Identify direction of river flow on contour map.	48	1.4	53	2.1	42	1.8
E09	No	Use table of time/temperature to determine point when weather changes.	82	1.2	84	1.6	81	1.7
E12	No	Identify type of stone involved in cave formation.	57	1.4	57	2.0	58	1.9
F05	No	Relate level of oxygen to elevation.	88	1.0	89	1.0	87	1.5
G11	No	Identify type of rock from description of its formation.	36	1.9	40	2.1	32	2.3
H03	No	Select explanation for moonlight.	91	0.8	93	1.0	89	1.2
H04	No	Identify ground layer containing the most organic material.	53	1.4	58	1.7	48	2.2
I17	Yes	Know energy source for Earth’s water cycle.	38	2.2	41	3.6	36	3.6
J01	Yes	Know changes in Earth’s surface over billions of years.	41	2.7	41	3.2	40	3.6
K15	Yes	Know organic origins of fossil fuels.	70	2.0	71	3.1	70	3.6
O12	Yes	Know relative amounts of components in air.	25	2.5	28	2.8	22	3.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	79	2.5	83	3.3	75	3.3
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	89	1.2	89	1.9	90	2.1
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	57	2.1	59	2.6	54	3.6
Q16	Yes	Estimate time for light from star to reach Earth.	37	2.3	43	3.4	30	2.7
R04	Yes	Give reason why ozone layer is important for life.	69	2.0	75	2.9	62	3.5
W01A	Yes	Give reason region in land/water diagram is a good farming location.	83	1.4	80	1.9	86	1.5
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	44	2.0	41	2.6	46	2.2
W02	Yes	Draw diagram showing Earth’s water cycle.	49	2.0	50	2.3	49	2.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Sweden SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	55	1.2	58	1.5	53	1.6
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	57	1.8	63	2.1	51	2.1
F04	No	Predict type of area where soil erosion by rain is most likely.	78	1.3	80	1.8	76	1.5
G12	No	Identify a nonrenewable natural resource.	37	1.4	40	1.9	34	1.8
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	30	2.0	32	3.5	28	3.0
I13	Yes	Select best scale for accurate measurement.	64	2.0	67	3.4	61	3.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	27	2.4	26	3.0	27	3.4
I18	Yes	Write conclusion from summary of experimental observations.	22	2.1	16	2.0	27	3.4
K19	Yes	Write an example of how computers are used to do work.	82	1.9	80	2.7	83	2.3
N01	Yes	Determine correct control experiment to test hypothesis.	63	2.1	60	2.8	65	3.1
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	61	2.3	70	3.1	51	3.0
N05	Yes	Identify a principal cause of acid rain.	31	1.9	39	3.0	24	2.4
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	68	2.1	63	3.0	74	2.7
Z02A	Yes	Write a reason why not all people have enough water.	64	2.1	60	3.1	68	2.6
Z02B	Yes	Write a second reason why not all people have enough water.	40	3.0	37	3.8	43	3.7

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Sweden SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	80	0.9	77	1.1	83	1.2
B04	No	Predict pulse/breathing rate change after exercise.	95	0.5	95	0.8	95	0.8
C08	No	Identify carrier of signals from eye to brain.	69	1.4	71	1.7	67	2.1
D05	No	Identify system carrying sensory messages to the brain.	59	1.4	60	1.8	58	2.4
D06	No	Relate plant part to seed development.	90	0.9	88	1.2	92	1.1
E08	No	Select correct statement of trait heredity from parents.	84	1.2	82	1.5	85	1.7
E10	No	Determine characteristics for classifying animals.	61	1.5	59	1.9	64	1.9
F01	No	Identify characteristic of mammal.	71	1.4	66	1.9	76	2.2
F03	No	Identify human organ which interprets senses.	67	1.6	70	2.1	65	2.1
G08	No	Identify main function of red blood cells.	59	1.6	62	2.2	56	1.8
G09	No	Identify reproductive cells involved in heredity.	76	1.4	75	1.7	78	1.6
H01	No	Identify the functions of blood.	85	0.9	84	1.4	87	1.5
H02	No	Identify the role of vitamins.	87	1.0	86	1.3	89	1.5
I10	Yes	Identify nutrition content of fruits and vegetables.	85	1.5	85	2.1	85	2.5
I11	Yes	Know identifying features of insects.	61	2.1	62	3.0	60	3.6
I14	Yes	Relate elbow action to a simple machine.	62	2.0	66	2.9	59	3.2
I19	Yes	Identify statement of oxygen production consistent with data.	62	2.3	60	3.1	65	3.8
J02	Yes	Choose species on Earth for shortest time.	89	1.5	92	1.6	86	2.3
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	51	2.6	53	3.4	50	3.6
J09	Yes	Explain how to determine the age of a cut tree.	93	1.1	94	1.6	93	1.7
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	52	2.4	52	3.3	51	3.6
K12	Yes	Relate reproductive cell production to population.	49	2.5	49	3.6	47	4.0
K16	Yes	Identify common product made with bacteria.	40	2.3	43	2.9	36	3.0
K18	Yes	Identify main function of chloroplasts in plant cell.	67	2.2	70	2.8	64	3.4
L02	Yes	Select reason why algae are close to ocean surface.	62	2.8	64	3.8	60	2.9
L03	Yes	Identify skull features typical of predators.	71	2.3	72	2.5	69	2.9
L05	Yes	Select most likely purpose for birds' singing.	82	1.6	80	2.3	84	2.1
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	55	2.4	53	3.1	57	3.0
M11	Yes	Complete a food web showing energy relationships.	57	2.6	55	4.0	58	3.2
N02	Yes	Choose meal which would give the most nutrients.	51	2.2	50	3.3	53	3.4
N04	Yes	Identify how decaying fish fertilize plants.	40	2.3	41	3.1	40	3.3
N06	Yes	Identify the most basic unit of living things.	78	2.0	79	2.8	77	2.8
O16	Yes	Give reason for thirst on a hot day.	69	2.5	72	3.2	65	3.8
O17	Yes	Describe how disease may be transmitted.	67	2.4	57	3.6	79	3.4
P04	Yes	Identify what happens to animals' biological processes during hibernation.	61	2.1	68	2.5	53	3.7
P06	Yes	Describe digestion occuring in the mouth.	22	2.2	22	2.7	22	2.9
Q17	Yes	Describe the advantage of having two eyes.	70	2.4	70	3.2	71	3.1
R03	Yes	Give example of consequences of introducing new species.	5	1.1	6	1.5	5	1.4
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	18	1.6	14	1.7	22	2.3
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	68	1.6	68	2.2	69	2.1
X02B	Yes	Explain why light is important in aquarium ecosystem.	24	1.4	25	1.8	23	2.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Sweden SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	70	0.8	68	1.2	71	1.1
A10	No	Relate light level and reflectance to vision of object.	75	1.0	75	1.2	75	1.1
B02	No	Know type of energy released from combustion engine.	53	1.6	55	1.8	51	2.0
B03	No	Determine density from mass/volume table.	25	1.3	29	1.4	21	2.0
B06	No	Relate color of object to amount of light reflection.	82	0.9	84	1.4	79	1.5
C09	No	Identify correct position of reflected image.	60	1.5	64	1.9	55	2.0
C12	No	Identify substance which is NOT a fossil fuel.	49	1.3	54	1.7	45	1.7
D01	No	Identify correct diagram of light rays through lens.	52	1.4	65	1.6	37	2.2
D02	No	Identify substance from magnetic properties.	80	1.0	83	1.3	77	1.6
D04	No	Relate physical event to its sequence of energy changes.	41	1.5	45	1.9	37	2.3
E07	No	Identify particles found in the nucleus of atoms.	40	1.8	39	2.2	42	2.4
E11	No	Find shadow size from diagram of bulb/card/screen distances.	65	1.5	70	1.7	60	2.7
F02	No	Relate color and light reflection to temperature of object.	71	1.4	75	1.8	68	1.8
G07	No	Identify correct way to place batteries in a flashlight.	92	0.8	93	1.0	90	1.3
H05	No	Identify source of energy stored in food.	33	1.6	33	1.8	33	2.1
I16	Yes	Identify material with greatest heat conductivity.	87	1.5	85	2.5	89	2.0
J05	Yes	Identify type of solar radiation that causes sunburn.	73	2.1	77	2.6	68	3.2
K10	Yes	Describe a method demonstrating the existence of air.	39	2.4	39	3.6	38	3.4
K13	Yes	Identify electrical conductors that form complete circuits.	88	1.8	91	1.7	85	2.9
K14	Yes	Relate evaporation rate to surface area.	84	1.7	85	2.3	83	2.4
K17	Yes	Relate presence of gravitational force to position of falling object.	59	2.6	61	3.3	57	3.5
L01	Yes	Select diagram showing forces resulting in rotation.	47	2.2	56	3.8	39	3.1
L04	Yes	Explain most efficient engine.	42	2.8	41	3.4	42	3.4
L07	Yes	Relate sound transmission to air.	71	2.3	72	3.1	70	3.3
M12	Yes	Complete table of voltage/current data for circuit.	58	2.2	64	3.1	52	3.0
M14	Yes	Draw reflected image of object.	65	2.2	66	2.7	65	3.0
N08	Yes	Relate lever arm lengths to balanced weights.	80	2.0	82	2.4	77	3.1
N10	Yes	Determine effect of tipping container on water surface.	65	1.8	74	2.7	55	3.1
O10	Yes	Identify polarity of ends of cut magnet.	54	2.7	48	3.8	62	3.2
O13	Yes	Relate circular motion to centripetal force.	64	2.1	75	2.6	52	3.3
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	88	1.6	90	2.1	87	2.9
P02	Yes	Explain relationship between illuminance and distance of light source.	29	1.8	32	3.0	25	2.6
P05	Yes	Explain why balloon expands upon heating.	69	2.1	74	2.8	65	3.4
Q12	Yes	Explain how focusing affects the amount of light.	39	2.2	46	3.2	30	3.0
Q13	Yes	Compare heat expansion properties of metal and glass.	81	2.3	82	3.0	81	3.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	30	2.4	32	3.0	28	3.2
R01	Yes	Choose diagram showing angle of reflected light.	55	2.7	58	3.4	52	3.6
R02	Yes	Identify reflection/absorption properties from color.	36	2.8	38	3.9	35	3.3
Y01	Yes	Explain amount of light/electric energy in a lamp.	3	0.5	4	0.8	2	0.7
Y02	Yes	Explain temperature of melting snowball.	15	1.3	14	1.7	17	1.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Switzerland SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	79	1.1	84	1.2	75	1.4
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	83	1.1	82	1.7	83	1.7
F06	No	Relate rusting iron to the presence of oxygen and moisture.	74	1.4	76	2.1	72	1.9
G10	No	Select correct statement regarding the atomic makeup of matter.	43	1.7	49	2.1	37	2.3
H06	No	Know if wood-burning reaction absorbs or releases energy.	57	1.6	64	2.5	49	2.0
J03	Yes	Know relationship between molecules, atoms and cells.	20	1.6	24	2.7	15	2.2
J04	Yes	Distiguish between a chemical reaction and a physical change.	35	2.8	36	2.9	33	4.2
J06	Yes	Know what happens to atoms in animal after death.	20	1.7	23	2.9	17	2.5
J08	Yes	Identify gas involved in fire ignition.	38	2.6	42	3.7	34	3.2
M10	Yes	Identify substances which are mixtures.	60	2.3	61	3.4	58	3.5
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	56	2.5	62	3.4	49	3.4
N07	Yes	Explain oxygen fuel requirements of burning candle.	96	1.0	96	1.6	95	0.9
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	50	2.7	53	3.5	44	3.6
O11	Yes	Identify which change in elemental form is due to a chemical change.	45	3.0	52	3.9	37	3.7
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	22	2.2	26	3.4	18	2.7
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	28	2.5	31	3.7	26	3.5
Q15	Yes	Determine physical processes involving chemical change.	25	2.4	29	3.6	21	3.3
R05	Yes	Explain how carbon dioxide fire extinguishers work.	57	2.5	64	3.7	51	4.0
Z01A	Yes	Explain why steel bridges must be painted.	64	2.6	66	4.0	61	3.4
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	54	2.4	54	3.1	54	4.2
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	34	2.3	38	3.5	29	3.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Switzerland SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	67	1.1	67	1.4	66	1.4
B01	No	Identify hottest layer of the Earth.	91	0.9	94	1.1	88	1.3
B05	No	Use elevation/weather diagram to locate earth feature.	58	1.7	60	2.3	56	1.9
C07	No	Relate mountain shape to age.	30	1.5	32	2.1	28	2.1
D03	No	Identify direction of river flow on contour map.	45	1.8	50	2.3	39	2.2
E09	No	Use table of time/temperature to determine point when weather changes.	88	1.0	89	1.2	88	1.4
E12	No	Identify type of stone involved in cave formation.	61	1.8	59	2.3	63	2.4
F05	No	Relate level of oxygen to elevation.	83	1.2	82	1.5	84	1.6
G11	No	Identify type of rock from description of its formation.	55	1.7	54	1.8	56	2.4
H03	No	Select explanation for moonlight.	87	1.0	88	1.6	86	1.7
H04	No	Identify ground layer containing the most organic material.	60	1.7	64	2.1	55	2.6
I17	Yes	Know energy source for Earth’s water cycle.	45	2.6	48	4.1	42	3.2
J01	Yes	Know changes in Earth’s surface over billions of years.	32	2.3	32	3.3	32	3.0
K15	Yes	Know organic origins of fossil fuels.	52	2.5	55	3.8	50	3.7
O12	Yes	Know relative amounts of components in air.	20	2.5	22	3.3	19	3.2
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	70	2.4	70	3.6	71	3.4
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	84	1.6	82	2.4	86	2.3
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	55	2.7	61	3.4	49	3.6
Q16	Yes	Estimate time for light from star to reach Earth.	26	2.3	32	3.9	21	2.7
R04	Yes	Give reason why ozone layer is important for life.	51	2.6	59	3.2	44	3.4
W01A	Yes	Give reason region in land/water diagram is a good farming location.	81	1.5	79	2.2	83	1.9
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	53	1.6	55	2.0	51	2.7
W02	Yes	Draw diagram showing Earth’s water cycle.	38	1.9	40	2.5	36	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Switzerland SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	58	1.2	60	1.6	56	1.5
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	44	1.5	50	2.4	37	2.2
F04	No	Predict type of area where soil erosion by rain is most likely.	71	1.5	75	1.7	66	2.3
G12	No	Identify a nonrenewable natural resource.	39	1.8	44	2.4	34	2.1
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	39	3.0	43	4.0	35	3.5
I13	Yes	Select best scale for accurate measurement.	69	2.7	75	3.7	63	4.0
I15	Yes	Identify the type of scientific statement given in an experimental report.	68	2.6	65	3.8	72	3.4
I18	Yes	Write conclusion from summary of experimental observations.	32	2.3	32	3.4	32	3.0
K19	Yes	Write an example of how computers are used to do work.	73	2.1	71	3.1	74	3.4
N01	Yes	Determine correct control experiment to test hypothesis.	51	3.0	52	4.1	50	3.7
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	52	2.7	59	4.0	43	3.0
N05	Yes	Identify a principal cause of acid rain.	39	2.6	42	3.2	34	3.8
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	25	1.9	28	2.5	23	2.9
Z02A	Yes	Write a reason why not all people have enough water.	62	2.6	59	3.1	66	3.9
Z02B	Yes	Write a second reason why not all people have enough water.	41	2.6	35	3.6	49	4.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Switzerland SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	72	1.0	68	1.3	77	1.5
B04	No	Predict pulse/breathing rate change after exercise.	91	0.9	90	1.0	92	1.3
C08	No	Identify carrier of signals from eye to brain.	61	1.8	60	2.4	62	2.1
D05	No	Identify system carrying sensory messages to the brain.	63	1.5	64	2.1	62	2.1
D06	No	Relate plant part to seed development.	83	1.5	84	1.6	82	1.9
E08	No	Select correct statement of trait heredity from parents.	86	1.1	81	1.9	90	0.9
E10	No	Determine characteristics for classifying animals.	62	1.8	63	2.3	61	2.1
F01	No	Identify characteristic of mammal.	74	1.2	70	1.6	77	1.6
F03	No	Identify human organ which interprets senses.	55	1.9	62	2.4	48	2.2
G08	No	Identify main function of red blood cells.	64	1.6	67	2.0	60	2.4
G09	No	Identify reproductive cells involved in heredity.	74	1.3	70	2.2	78	1.8
H01	No	Identify the functions of blood.	79	1.3	79	1.9	79	1.9
H02	No	Identify the role of vitamins.	79	1.5	79	2.0	79	2.3
I10	Yes	Identify nutrition content of fruits and vegetables.	85	1.6	85	2.6	86	2.2
I11	Yes	Know identifying features of insects.	49	2.2	56	3.5	42	3.4
I14	Yes	Relate elbow action to a simple machine.	59	2.9	65	3.5	54	3.6
I19	Yes	Identify statement of oxygen production consistent with data.	50	2.6	50	4.1	50	3.5
J02	Yes	Choose species on Earth for shortest time.	72	2.2	69	3.1	76	3.1
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	41	2.5	46	3.5	36	3.5
J09	Yes	Explain how to determine the age of a cut tree.	86	1.9	87	2.3	84	2.5
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	52	2.4	47	3.1	57	3.8
K12	Yes	Relate reproductive cell production to population.	56	2.6	53	4.3	59	4.0
K16	Yes	Identify common product made with bacteria.	32	2.4	33	3.5	32	2.8
K18	Yes	Identify main function of chloroplasts in plant cell.	48	2.7	47	3.5	49	3.8
L02	Yes	Select reason why algae are close to ocean surface.	61	2.5	62	4.1	60	3.5
L03	Yes	Identify skull features typical of predators.	81	2.5	81	3.5	82	3.1
L05	Yes	Select most likely purpose for birds' singing.	69	2.5	67	4.0	72	2.8
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	60	2.9	57	3.9	62	3.8
M11	Yes	Complete a food web showing energy relationships.	77	2.4	75	3.1	78	3.4
N02	Yes	Choose meal which would give the most nutrients.	36	2.4	33	3.3	41	3.4
N04	Yes	Identify how decaying fish fertilize plants.	43	2.4	42	3.3	44	3.8
N06	Yes	Identify the most basic unit of living things.	54	2.4	58	3.3	49	3.1
O16	Yes	Give reason for thirst on a hot day.	68	2.4	73	3.1	63	3.8
O17	Yes	Describe how disease may be transmitted.	59	2.5	58	3.8	61	3.3
P04	Yes	Identify what happens to animals' biological processes during hibernation.	67	2.3	73	3.4	63	3.7
P06	Yes	Describe digestion occuring in the mouth.	32	2.4	30	3.2	33	3.6
Q17	Yes	Describe the advantage of having two eyes.	60	2.8	61	3.7	59	3.7
R03	Yes	Give example of consequences of introducing new species.	8	1.2	10	1.8	6	1.3
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	14	1.2	12	1.6	17	1.7
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	73	2.1	70	2.3	75	2.6
X02B	Yes	Explain why light is important in aquarium ecosystem.	33	1.8	36	2.3	30	2.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Switzerland SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	73	1.0	72	1.5	74	1.2
A10	No	Relate light level and reflectance to vision of object.	71	0.9	72	1.5	69	1.4
B02	No	Know type of energy released from combustion engine.	50	1.5	51	2.1	49	1.9
B03	No	Determine density from mass/volume table.	26	1.2	31	2.0	20	1.3
B06	No	Relate color of object to amount of light reflection.	88	0.8	88	1.2	88	1.4
C09	No	Identify correct position of reflected image.	85	1.2	88	1.5	81	1.8
C12	No	Identify substance which is NOT a fossil fuel.	42	1.8	45	2.0	39	2.5
D01	No	Identify correct diagram of light rays through lens.	42	1.8	51	2.5	33	2.6
D02	No	Identify substance from magnetic properties.	73	1.5	78	1.6	68	2.4
D04	No	Relate physical event to its sequence of energy changes.	52	1.6	55	2.1	49	2.3
E07	No	Identify particles found in the nucleus of atoms.	36	2.0	39	2.8	33	2.0
E11	No	Find shadow size from diagram of bulb/card/screen distances.	64	1.6	66	2.0	62	2.1
F02	No	Relate color and light reflection to temperature of object.	74	1.5	77	2.0	71	1.9
G07	No	Identify correct way to place batteries in a flashlight.	88	1.0	91	1.0	84	1.8
H05	No	Identify source of energy stored in food.	25	1.6	25	1.9	25	2.3
I16	Yes	Identify material with greatest heat conductivity.	84	2.3	85	3.1	81	2.8
J05	Yes	Identify type of solar radiation that causes sunburn.	65	2.6	71	3.7	60	3.2
K10	Yes	Describe a method demonstrating the existence of air.	32	2.3	33	3.5	32	3.5
K13	Yes	Identify electrical conductors that form complete circuits.	77	2.1	87	1.8	68	3.6
K14	Yes	Relate evaporation rate to surface area.	84	2.4	84	2.8	83	3.9
K17	Yes	Relate presence of gravitational force to position of falling object.	53	2.9	56	4.6	50	3.3
L01	Yes	Select diagram showing forces resulting in rotation.	53	2.8	55	4.2	52	3.8
L04	Yes	Explain most efficient engine.	50	2.5	51	3.6	49	3.7
L07	Yes	Relate sound transmission to air.	76	2.3	83	2.8	69	3.7
M12	Yes	Complete table of voltage/current data for circuit.	75	2.3	80	2.7	71	3.3
M14	Yes	Draw reflected image of object.	81	2.2	83	2.9	80	3.3
N08	Yes	Relate lever arm lengths to balanced weights.	83	1.9	85	2.7	81	3.3
N10	Yes	Determine effect of tipping container on water surface.	68	3.1	75	4.0	58	4.3
O10	Yes	Identify polarity of ends of cut magnet.	59	2.9	56	3.7	62	3.8
O13	Yes	Relate circular motion to centripetal force.	67	2.6	72	3.1	61	3.7
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	90	1.5	91	1.9	89	2.0
P02	Yes	Explain relationship between illuminance and distance of light source.	11	1.2	14	2.2	8	1.5
P05	Yes	Explain why balloon expands upon heating.	61	2.0	64	3.1	58	3.3
Q12	Yes	Explain how focusing affects the amount of light.	46	2.5	52	3.4	41	3.6
Q13	Yes	Compare heat expansion properties of metal and glass.	69	2.3	71	3.0	67	3.7
Q18	Yes	Explain effect of melting on the mass of ice cubes.	25	2.1	26	3.0	24	2.8
R01	Yes	Choose diagram showing angle of reflected light.	71	2.2	75	3.1	66	3.3
R02	Yes	Identify reflection/absorption properties from color.	37	2.6	35	3.9	38	3.9
Y01	Yes	Explain amount of light/electric energy in a lamp.	7	1.0	8	1.5	4	1.1
Y02	Yes	Explain temperature of melting snowball.	18	1.4	19	2.1	17	1.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Thailand SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	61	1.9	62	2.0	61	2.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	28	1.7	29	2.4	27	1.9
F06	No	Relate rusting iron to the presence of oxygen and moisture.	73	1.4	73	2.1	74	1.7
G10	No	Select correct statement regarding the atomic makeup of matter.	37	1.6	37	2.2	37	2.5
H06	No	Know if wood-burning reaction absorbs or releases energy.	52	1.9	54	2.3	52	2.5
J03	Yes	Know relationship between molecules, atoms and cells.	31	2.8	27	3.4	34	3.6
J04	Yes	Distiguish between a chemical reaction and a physical change.	37	2.7	30	3.7	43	3.3
J06	Yes	Know what happens to atoms in animal after death.	19	1.8	16	2.4	22	2.5
J08	Yes	Identify gas involved in fire ignition.	55	3.1	53	4.6	57	3.3
M10	Yes	Identify substances which are mixtures.	36	2.6	37	3.6	36	3.2
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	39	2.3	38	4.0	39	3.0
N07	Yes	Explain oxygen fuel requirements of burning candle.	81	1.8	79	2.7	83	2.2
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	40	2.3	40	3.4	41	3.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	37	2.4	38	3.6	37	3.0
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	16	1.7	10	1.9	19	2.6
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	45	2.6	39	3.8	50	3.7
Q15	Yes	Determine physical processes involving chemical change.	16	1.9	16	2.9	16	2.1
R05	Yes	Explain how carbon dioxide fire extinguishers work.	34	2.4	37	4.1	33	3.4
Z01A	Yes	Explain why steel bridges must be painted.	73	2.0	73	3.2	73	2.7
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	51	2.4	49	3.3	52	2.9
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	42	2.6	42	3.8	43	3.2

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Thailand SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	68	1.2	66	1.5	69	1.3
B01	No	Identify hottest layer of the Earth.	80	1.4	82	1.5	79	1.8
B05	No	Use elevation/weather diagram to locate earth feature.	40	1.4	42	2.1	40	1.4
C07	No	Relate mountain shape to age.	32	1.9	32	2.3	32	2.1
D03	No	Identify direction of river flow on contour map.	33	1.4	37	2.1	31	1.8
E09	No	Use table of time/temperature to determine point when weather changes.	89	1.0	88	1.6	90	1.0
E12	No	Identify type of stone involved in cave formation.	55	1.9	53	2.4	55	2.4
F05	No	Relate level of oxygen to elevation.	83	1.1	84	1.5	82	1.3
G11	No	Identify type of rock from description of its formation.	57	1.4	57	1.8	57	1.9
H03	No	Select explanation for moonlight.	84	1.1	86	1.4	84	1.4
H04	No	Identify ground layer containing the most organic material.	77	1.6	78	2.0	76	1.8
I17	Yes	Know energy source for Earth’s water cycle.	36	2.3	35	4.0	36	2.7
J01	Yes	Know changes in Earth’s surface over billions of years.	35	2.5	31	3.2	38	3.0
K15	Yes	Know organic origins of fossil fuels.	58	2.6	58	2.9	57	3.4
O12	Yes	Know relative amounts of components in air.	18	2.3	17	3.0	18	2.7
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	51	2.5	56	3.3	49	3.4
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	71	2.5	66	3.9	74	3.1
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	57	2.3	56	3.8	58	2.8
R04	Yes	Give reason why ozone layer is important for life.	45	2.7	42	3.6	47	3.4
W01A	Yes	Give reason region in land/water diagram is a good farming location.	95	0.7	95	0.9	94	1.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	75	1.6	77	2.2	73	1.8
W02	Yes	Draw diagram showing Earth’s water cycle.	16	1.4	16	2.0	16	1.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Thailand SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	73	1.0	73	1.3	73	1.2
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	67	1.5	70	1.8	65	2.0
F04	No	Predict type of area where soil erosion by rain is most likely.	84	1.2	84	1.6	85	1.4
G12	No	Identify a nonrenewable natural resource.	60	1.7	64	2.2	58	2.2
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	38	2.2	34	3.3	39	3.0
I13	Yes	Select best scale for accurate measurement.	46	2.9	47	3.8	46	3.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	65	1.9	61	3.6	68	2.5
I18	Yes	Write conclusion from summary of experimental observations.	53	3.0	50	4.1	54	3.4
K19	Yes	Write an example of how computers are used to do work.	85	1.9	87	2.6	83	2.4
N01	Yes	Determine correct control experiment to test hypothesis.	29	2.6	28	3.8	29	3.6
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	45	2.1	48	3.3	43	2.9
N05	Yes	Identify a principal cause of acid rain.	62	2.2	65	2.9	60	2.9
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	77	2.1	71	3.1	81	2.5
Z02A	Yes	Write a reason why not all people have enough water.	86	1.5	84	2.3	87	1.7
Z02B	Yes	Write a second reason why not all people have enough water.	60	2.3	58	3.0	61	3.2

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Thailand SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	91	0.5	89	0.8	92	0.6
B04	No	Predict pulse/breathing rate change after exercise.	91	0.8	90	1.3	92	0.9
C08	No	Identify carrier of signals from eye to brain.	93	0.6	92	1.0	93	0.8
D05	No	Identify system carrying sensory messages to the brain.	88	1.1	88	1.3	88	1.3
D06	No	Relate plant part to seed development.	83	1.5	84	2.1	82	1.5
E08	No	Select correct statement of trait heredity from parents.	77	1.5	71	1.8	80	1.5
E10	No	Determine characteristics for classifying animals.	66	1.4	66	2.0	66	1.8
F01	No	Identify characteristic of mammal.	76	1.1	79	1.4	74	1.6
F03	No	Identify human organ which interprets senses.	39	1.9	40	2.9	38	2.1
G08	No	Identify main function of red blood cells.	68	1.8	68	2.1	68	2.0
G09	No	Identify reproductive cells involved in heredity.	82	1.3	81	1.8	83	1.6
H01	No	Identify the functions of blood.	93	0.6	92	1.0	94	0.8
H02	No	Identify the role of vitamins.	82	1.2	81	1.8	82	1.3
I10	Yes	Identify nutrition content of fruits and vegetables.	81	1.9	75	3.1	84	1.8
I11	Yes	Know identifying features of insects.	44	2.5	44	3.5	43	2.8
I14	Yes	Relate elbow action to a simple machine.	27	2.1	27	3.2	27	2.5
I19	Yes	Identify statement of oxygen production consistent with data.	64	2.3	60	4.1	67	2.6
J02	Yes	Choose species on Earth for shortest time.	81	1.8	81	2.4	82	2.3
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	59	2.1	57	3.2	60	2.6
J09	Yes	Explain how to determine the age of a cut tree.	48	2.7	48	3.2	48	3.6
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	71	2.1	67	2.8	74	2.7
K12	Yes	Relate reproductive cell production to population.	48	2.4	39	3.2	53	3.3
K16	Yes	Identify common product made with bacteria.	77	2.1	77	2.8	78	2.5
K18	Yes	Identify main function of chloroplasts in plant cell.	47	2.2	41	3.5	51	2.6
L02	Yes	Select reason why algae are close to ocean surface.	57	2.8	57	4.0	57	3.2
L03	Yes	Identify skull features typical of predators.	71	1.9	73	3.0	70	2.7
L05	Yes	Select most likely purpose for birds' singing.	72	2.0	70	3.4	72	2.7
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	53	2.7	56	4.3	51	3.0
M11	Yes	Complete a food web showing energy relationships.	79	2.0	81	2.8	77	2.6
N02	Yes	Choose meal which would give the most nutrients.	65	2.2	65	3.1	64	3.0
N04	Yes	Identify how decaying fish fertilize plants.	77	2.4	83	2.7	74	2.9
N06	Yes	Identify the most basic unit of living things.	78	2.3	75	3.3	80	2.6
O16	Yes	Give reason for thirst on a hot day.	77	2.3	78	2.8	77	3.0
O17	Yes	Describe how disease may be transmitted.	40	2.3	34	3.3	44	2.7
P06	Yes	Describe digestion occuring in the mouth.	54	2.3	50	3.5	56	3.3
Q17	Yes	Describe the advantage of having two eyes.	87	1.5	85	2.5	89	1.8
R03	Yes	Give example of consequences of introducing new species.	19	3.2	17	3.9	20	3.9
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	18	1.7	15	1.9	20	2.3
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	79	1.6	77	2.3	80	1.8
X02B	Yes	Explain why light is important in aquarium ecosystem.	49	2.5	46	3.4	51	2.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Thailand SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	75	1.1	73	1.5	77	1.3
A10	No	Relate light level and reflectance to vision of object.	69	1.2	67	1.5	70	1.4
B02	No	Know type of energy released from combustion engine.	61	1.5	57	1.9	63	1.8
B03	No	Determine density from mass/volume table.	29	1.7	28	2.5	30	2.1
B06	No	Relate color of object to amount of light reflection.	71	1.4	70	1.9	72	1.7
C09	No	Identify correct position of reflected image.	58	1.5	60	2.2	57	1.8
C12	No	Identify substance which is NOT a fossil fuel.	58	1.5	61	2.1	57	1.8
D01	No	Identify correct diagram of light rays through lens.	47	1.8	51	2.1	44	2.5
D02	No	Identify substance from magnetic properties.	71	1.6	72	2.2	71	2.0
D04	No	Relate physical event to its sequence of energy changes.	71	1.2	71	1.7	72	1.5
E07	No	Identify particles found in the nucleus of atoms.	49	2.2	45	2.7	52	2.6
E11	No	Find shadow size from diagram of bulb/card/screen distances.	65	1.4	62	2.1	67	1.8
F02	No	Relate color and light reflection to temperature of object.	45	1.8	51	2.5	42	2.3
G07	No	Identify correct way to place batteries in a flashlight.	94	0.6	95	0.7	93	0.9
H05	No	Identify source of energy stored in food.	24	1.5	22	1.8	25	1.8
I16	Yes	Identify material with greatest heat conductivity.	86	1.5	82	2.8	89	1.6
J05	Yes	Identify type of solar radiation that causes sunburn.	89	1.3	87	1.9	91	1.8
K10	Yes	Describe a method demonstrating the existence of air.	38	2.6	36	3.2	40	3.3
K13	Yes	Identify electrical conductors that form complete circuits.	78	1.7	82	2.5	75	2.3
K14	Yes	Relate evaporation rate to surface area.	90	1.4	89	2.2	91	1.6
K17	Yes	Relate presence of gravitational force to position of falling object.	57	2.3	59	3.3	56	2.8
L01	Yes	Select diagram showing forces resulting in rotation.	31	2.2	36	3.9	28	2.9
L04	Yes	Explain most efficient engine.	5	1.0	4	1.2	6	1.4
L07	Yes	Relate sound transmission to air.	70	2.0	76	3.2	66	2.8
M12	Yes	Complete table of voltage/current data for circuit.	55	2.4	54	4.0	57	3.0
M14	Yes	Draw reflected image of object.	65	2.3	69	3.3	62	2.8
N08	Yes	Relate lever arm lengths to balanced weights.	83	1.7	87	2.6	80	2.3
N10	Yes	Determine effect of tipping container on water surface.	41	2.4	50	3.0	36	3.3
O10	Yes	Identify polarity of ends of cut magnet.	66	2.2	65	3.5	67	3.1
O13	Yes	Relate circular motion to centripetal force.	44	2.4	45	3.4	43	3.5
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	83	1.6	83	2.8	84	1.9
P02	Yes	Explain relationship between illuminance and distance of light source.	5	1.1	4	1.3	6	1.6
P05	Yes	Explain why balloon expands upon heating.	64	2.0	65	3.6	63	2.4
Q12	Yes	Explain how focusing affects the amount of light.	41	2.7	41	3.3	41	3.3
Q13	Yes	Compare heat expansion properties of metal and glass.	57	2.0	57	3.0	58	2.9
Q18	Yes	Explain effect of melting on the mass of ice cubes.	23	2.3	19	3.3	25	2.8
R01	Yes	Choose diagram showing angle of reflected light.	76	1.9	76	2.7	77	2.6
R02	Yes	Identify reflection/absorption properties from color.	47	2.2	42	4.0	51	2.9
Y01	Yes	Explain amount of light/electric energy in a lamp.	2	0.5	2	0.7	2	0.6
Y02	Yes	Explain temperature of melting snowball.	9	1.0	11	1.8	8	1.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=England SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	86	1.0	89	1.2	83	1.5
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	77	1.9	79	2.6	74	2.7
F06	No	Relate rusting iron to the presence of oxygen and moisture.	73	1.9	74	2.8	72	2.4
G10	No	Select correct statement regarding the atomic makeup of matter.	56	2.1	61	2.4	51	3.1
H06	No	Know if wood-burning reaction absorbs or releases energy.	67	2.2	71	2.7	62	3.5
J03	Yes	Know relationship between molecules, atoms and cells.	34	3.0	35	4.5	32	4.2
J04	Yes	Distiguish between a chemical reaction and a physical change.	44	3.4	39	4.6	50	5.6
J06	Yes	Know what happens to atoms in animal after death.	32	3.4	35	4.9	29	4.8
J08	Yes	Identify gas involved in fire ignition.	41	3.2	45	5.2	37	4.6
M10	Yes	Identify substances which are mixtures.	45	2.9	44	4.5	46	4.3
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	59	2.9	63	4.2	55	5.0
N07	Yes	Explain oxygen fuel requirements of burning candle.	97	1.1	98	1.2	96	2.0
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	69	2.5	66	3.7	74	4.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	28	3.2	35	4.5	21	3.9
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	28	2.9	28	4.2	27	4.3
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	49	4.3	51	5.2	47	5.3
Q15	Yes	Determine physical processes involving chemical change.	41	3.5	42	4.7	40	4.7
R05	Yes	Explain how carbon dioxide fire extinguishers work.	71	3.1	78	3.4	62	4.9
Z01A	Yes	Explain why steel bridges must be painted.	85	2.6	86	3.1	84	4.2
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	49	3.0	53	4.7	44	5.1
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	30	3.5	28	4.5	32	5.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=England SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	56	1.4	57	2.1	54	1.5
B01	No	Identify hottest layer of the Earth.	91	0.9	93	1.2	88	1.7
B05	No	Use elevation/weather diagram to locate earth feature.	47	2.0	48	2.8	46	2.4
C07	No	Relate mountain shape to age.	36	2.2	37	2.9	34	2.8
D03	No	Identify direction of river flow on contour map.	45	2.0	52	2.8	36	2.8
E09	No	Use table of time/temperature to determine point when weather changes.	86	1.5	86	1.9	86	2.1
E12	No	Identify type of stone involved in cave formation.	58	2.4	60	3.1	57	3.1
F05	No	Relate level of oxygen to elevation.	91	1.1	91	1.6	90	1.3
G11	No	Identify type of rock from description of its formation.	59	2.0	54	2.8	65	2.7
H03	No	Select explanation for moonlight.	77	1.5	81	2.2	74	2.1
H04	No	Identify ground layer containing the most organic material.	48	2.2	55	3.1	40	3.3
I17	Yes	Know energy source for Earth’s water cycle.	53	3.1	54	4.6	51	4.4
J01	Yes	Know changes in Earth’s surface over billions of years.	38	3.1	34	4.7	42	4.5
K15	Yes	Know organic origins of fossil fuels.	85	2.6	88	3.8	81	3.2
O12	Yes	Know relative amounts of components in air.	17	2.6	18	3.7	15	3.4
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	60	3.7	66	4.9	54	5.1
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	88	2.3	84	3.2	94	2.4
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	33	3.2	38	4.6	27	3.9
Q16	Yes	Estimate time for light from star to reach Earth.	32	2.9	37	4.5	26	4.4
R04	Yes	Give reason why ozone layer is important for life.	38	3.1	46	4.4	30	4.7
W01A	Yes	Give reason region in land/water diagram is a good farming location.	92	1.5	92	1.9	92	1.9
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	74	2.2	71	3.0	76	3.3
W02	Yes	Draw diagram showing Earth’s water cycle.	53	2.3	54	3.5	52	3.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=England SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	73	1.3	75	1.6	72	1.9
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	63	2.0	70	2.7	54	2.6
F04	No	Predict type of area where soil erosion by rain is most likely.	79	1.7	79	2.5	79	2.0
G12	No	Identify a nonrenewable natural resource.	70	1.8	74	2.3	66	2.8
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	53	3.4	56	4.7	50	4.5
I13	Yes	Select best scale for accurate measurement.	52	2.8	54	4.7	49	4.5
I15	Yes	Identify the type of scientific statement given in an experimental report.	62	3.0	62	4.4	62	4.5
I18	Yes	Write conclusion from summary of experimental observations.	56	3.8	50	4.9	62	4.8
K19	Yes	Write an example of how computers are used to do work.	91	2.2	89	3.3	93	2.5
N01	Yes	Determine correct control experiment to test hypothesis.	44	3.2	43	4.4	45	5.4
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	72	3.4	75	4.4	67	5.2
N05	Yes	Identify a principal cause of acid rain.	44	3.5	47	4.9	40	4.7
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	64	3.5	57	4.4	73	4.7
Z02A	Yes	Write a reason why not all people have enough water.	83	2.3	80	3.7	87	3.8
Z02B	Yes	Write a second reason why not all people have enough water.	62	3.6	62	4.7	63	4.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=England SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	67	1.3	63	1.8	71	2.0
B04	No	Predict pulse/breathing rate change after exercise.	96	0.6	95	1.0	96	0.9
C08	No	Identify carrier of signals from eye to brain.	80	1.6	79	2.1	81	2.1
D05	No	Identify system carrying sensory messages to the brain.	70	1.8	74	2.6	66	2.7
D06	No	Relate plant part to seed development.	62	2.1	64	2.7	60	2.9
E08	No	Select correct statement of trait heredity from parents.	86	1.2	85	1.8	88	1.6
E10	No	Determine characteristics for classifying animals.	65	2.0	67	2.4	63	2.9
F01	No	Identify characteristic of mammal.	49	2.3	52	3.1	45	2.8
F03	No	Identify human organ which interprets senses.	80	1.5	79	2.3	80	2.3
G08	No	Identify main function of red blood cells.	78	1.5	84	2.2	72	2.6
G09	No	Identify reproductive cells involved in heredity.	82	1.7	81	2.6	84	1.9
H01	No	Identify the functions of blood.	74	2.1	72	2.8	77	3.0
H02	No	Identify the role of vitamins.	82	1.7	77	2.4	86	2.0
I10	Yes	Identify nutrition content of fruits and vegetables.	66	3.4	63	4.4	69	4.4
I11	Yes	Know identifying features of insects.	50	3.4	54	4.9	45	4.8
I14	Yes	Relate elbow action to a simple machine.	70	3.5	69	4.2	72	4.8
I19	Yes	Identify statement of oxygen production consistent with data.	65	3.4	65	4.4	64	5.3
J02	Yes	Choose species on Earth for shortest time.	82	3.0	83	3.6	80	4.3
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	45	3.3	43	4.9	48	4.5
J09	Yes	Explain how to determine the age of a cut tree.	79	2.6	81	3.2	76	4.4
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	67	3.1	69	4.5	65	4.3
K12	Yes	Relate reproductive cell production to population.	70	3.6	72	5.2	68	4.9
K16	Yes	Identify common product made with bacteria.	48	3.5	53	4.3	42	5.2
K18	Yes	Identify main function of chloroplasts in plant cell.	58	3.3	54	5.4	62	4.8
L02	Yes	Select reason why algae are close to ocean surface.	49	4.3	51	5.5	47	5.1
L03	Yes	Identify skull features typical of predators.	66	2.9	74	4.1	58	5.3
L05	Yes	Select most likely purpose for birds' singing.	67	3.6	70	4.9	65	5.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	65	3.4	68	4.4	62	5.3
M11	Yes	Complete a food web showing energy relationships.	81	2.3	84	3.4	78	4.0
N02	Yes	Choose meal which would give the most nutrients.	35	3.5	37	3.9	33	4.9
N04	Yes	Identify how decaying fish fertilize plants.	48	3.5	51	4.2	45	5.3
N06	Yes	Identify the most basic unit of living things.	59	3.3	65	4.4	52	5.6
O16	Yes	Give reason for thirst on a hot day.	61	2.9	69	4.2	54	4.5
O17	Yes	Describe how disease may be transmitted.	78	2.9	82	4.0	74	4.4
P04	Yes	Identify what happens to animals' biological processes during hibernation.	53	3.5	58	4.6	47	4.9
P06	Yes	Describe digestion occuring in the mouth.	62	3.4	59	5.1	66	4.6
Q17	Yes	Describe the advantage of having two eyes.	85	2.5	88	3.3	81	3.5
R03	Yes	Give example of consequences of introducing new species.	26	3.1	22	3.8	31	5.3
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	26	2.3	23	3.3	29	3.4
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	69	2.5	70	3.3	69	3.3
X02B	Yes	Explain why light is important in aquarium ecosystem.	22	2.1	22	3.2	21	2.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=England SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	78	1.0	79	1.4	77	1.6
A10	No	Relate light level and reflectance to vision of object.	76	1.1	76	1.7	76	1.4
B02	No	Know type of energy released from combustion engine.	67	1.6	68	2.1	66	2.4
B03	No	Determine density from mass/volume table.	22	1.8	28	2.6	15	1.9
B06	No	Relate color of object to amount of light reflection.	87	1.5	89	1.8	84	1.9
C09	No	Identify correct position of reflected image.	83	1.3	84	2.0	83	1.9
C12	No	Identify substance which is NOT a fossil fuel.	58	2.2	61	2.9	55	3.0
D01	No	Identify correct diagram of light rays through lens.	33	2.0	38	2.9	28	2.5
D02	No	Identify substance from magnetic properties.	88	1.4	90	2.0	87	1.6
D04	No	Relate physical event to its sequence of energy changes.	76	1.5	79	2.4	73	2.3
E07	No	Identify particles found in the nucleus of atoms.	40	2.0	40	3.3	41	2.9
E11	No	Find shadow size from diagram of bulb/card/screen distances.	60	2.4	61	3.3	59	3.2
F02	No	Relate color and light reflection to temperature of object.	72	2.0	74	2.8	70	2.6
G07	No	Identify correct way to place batteries in a flashlight.	94	0.9	95	1.3	93	1.5
H05	No	Identify source of energy stored in food.	39	1.9	40	2.9	37	2.6
I16	Yes	Identify material with greatest heat conductivity.	91	2.0	93	2.3	87	3.2
J05	Yes	Identify type of solar radiation that causes sunburn.	70	3.3	73	4.4	67	4.6
K10	Yes	Describe a method demonstrating the existence of air.	35	2.8	32	3.8	38	4.4
K13	Yes	Identify electrical conductors that form complete circuits.	90	1.9	91	2.8	90	3.1
K14	Yes	Relate evaporation rate to surface area.	84	2.5	83	3.7	86	2.9
K17	Yes	Relate presence of gravitational force to position of falling object.	51	3.4	55	4.7	47	4.7
L01	Yes	Select diagram showing forces resulting in rotation.	59	3.4	66	4.8	53	4.4
L04	Yes	Explain most efficient engine.	51	4.1	54	5.4	49	5.0
L07	Yes	Relate sound transmission to air.	76	3.0	79	4.1	73	4.1
M12	Yes	Complete table of voltage/current data for circuit.	51	3.1	59	4.5	42	4.7
M14	Yes	Draw reflected image of object.	84	2.4	81	3.4	87	3.3
N08	Yes	Relate lever arm lengths to balanced weights.	78	3.0	78	4.1	78	4.5
N10	Yes	Determine effect of tipping container on water surface.	70	2.9	76	3.8	61	4.5
O10	Yes	Identify polarity of ends of cut magnet.	66	3.4	60	5.2	72	4.1
O13	Yes	Relate circular motion to centripetal force.	60	3.7	69	4.6	52	5.1
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	88	2.2	88	2.9	87	3.7
P02	Yes	Explain relationship between illuminance and distance of light source.	35	3.6	37	4.4	32	5.0
P05	Yes	Explain why balloon expands upon heating.	69	2.9	72	3.9	66	4.5
Q12	Yes	Explain how focusing affects the amount of light.	65	3.0	69	4.0	61	4.5
Q13	Yes	Compare heat expansion properties of metal and glass.	63	3.4	67	4.5	58	5.7
Q18	Yes	Explain effect of melting on the mass of ice cubes.	34	3.1	34	3.8	33	4.3
R01	Yes	Choose diagram showing angle of reflected light.	84	2.7	85	3.7	82	3.6
R02	Yes	Identify reflection/absorption properties from color.	48	3.9	50	4.9	45	5.3
Y01	Yes	Explain amount of light/electric energy in a lamp.	12	1.8	12	2.3	11	2.5
Y02	Yes	Explain temperature of melting snowball.	17	1.9	17	2.6	17	2.7

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Scotland SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	84	1.0	87	1.0	80	1.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	69	1.6	71	2.3	66	2.3
F06	No	Relate rusting iron to the presence of oxygen and moisture.	67	1.8	70	2.6	63	2.1
G10	No	Select correct statement regarding the atomic makeup of matter.	51	2.0	55	2.7	46	2.6
H06	No	Know if wood-burning reaction absorbs or releases energy.	61	2.0	66	2.4	54	2.3
J03	Yes	Know relationship between molecules, atoms and cells.	27	2.8	30	3.7	24	3.3
J04	Yes	Distiguish between a chemical reaction and a physical change.	34	3.3	35	4.7	33	3.6
J06	Yes	Know what happens to atoms in animal after death.	22	3.1	29	4.4	14	2.6
J08	Yes	Identify gas involved in fire ignition.	49	3.2	56	4.5	42	4.1
M10	Yes	Identify substances which are mixtures.	44	2.5	48	3.0	40	3.8
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	56	2.7	61	3.7	50	4.3
N07	Yes	Explain oxygen fuel requirements of burning candle.	93	1.4	94	1.9	91	2.2
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	58	2.7	61	4.0	56	3.4
O11	Yes	Identify which change in elemental form is due to a chemical change.	32	2.8	34	4.2	29	3.4
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	21	2.1	23	3.1	19	3.1
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	59	3.3	56	4.2	63	4.2
Q15	Yes	Determine physical processes involving chemical change.	33	2.9	38	4.4	27	3.7
R05	Yes	Explain how carbon dioxide fire extinguishers work.	59	3.5	64	4.4	53	4.7
Z01A	Yes	Explain why steel bridges must be painted.	81	2.4	87	2.9	74	3.3
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	48	3.0	52	4.3	44	4.0
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	29	3.0	33	4.1	24	3.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Scotland SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	52	1.6	54	2.1	51	1.7
B01	No	Identify hottest layer of the Earth.	87	1.1	92	1.1	82	1.7
B05	No	Use elevation/weather diagram to locate earth feature.	42	1.5	43	2.0	41	2.2
C07	No	Relate mountain shape to age.	25	1.6	29	2.1	21	2.0
D03	No	Identify direction of river flow on contour map.	40	1.8	49	2.2	31	2.2
E09	No	Use table of time/temperature to determine point when weather changes.	84	1.4	87	1.5	81	2.0
E12	No	Identify type of stone involved in cave formation.	37	1.9	40	2.5	35	2.1
F05	No	Relate level of oxygen to elevation.	88	1.2	89	1.3	86	1.8
G11	No	Identify type of rock from description of its formation.	46	2.0	48	2.3	44	2.8
H03	No	Select explanation for moonlight.	70	2.1	75	2.2	64	2.9
H04	No	Identify ground layer containing the most organic material.	47	1.7	49	1.9	46	2.7
I17	Yes	Know energy source for Earth’s water cycle.	41	2.9	42	3.7	40	3.8
J01	Yes	Know changes in Earth’s surface over billions of years.	38	2.9	41	4.1	34	4.2
K15	Yes	Know organic origins of fossil fuels.	65	2.8	70	3.8	59	3.3
O12	Yes	Know relative amounts of components in air.	25	2.9	25	3.6	26	3.6
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	56	2.8	64	3.5	48	4.2
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	84	2.3	82	3.4	87	2.8
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	21	2.4	25	4.1	15	3.1
Q16	Yes	Estimate time for light from star to reach Earth.	32	2.6	37	3.6	27	3.5
R04	Yes	Give reason why ozone layer is important for life.	42	2.7	51	3.6	31	4.4
W01A	Yes	Give reason region in land/water diagram is a good farming location.	81	1.7	81	2.1	81	2.6
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	52	2.0	56	2.7	48	3.0
W02	Yes	Draw diagram showing Earth’s water cycle.	40	2.2	46	3.4	34	3.1

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Scotland SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	66	1.5	68	1.5	64	1.9
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	58	2.0	62	2.5	54	2.5
F04	No	Predict type of area where soil erosion by rain is most likely.	74	1.7	76	2.2	73	2.1
G12	No	Identify a nonrenewable natural resource.	65	1.6	70	2.1	60	2.0
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	39	3.3	47	4.2	31	4.1
I13	Yes	Select best scale for accurate measurement.	49	2.7	55	3.7	42	4.3
I15	Yes	Identify the type of scientific statement given in an experimental report.	44	3.3	42	4.2	47	4.4
I18	Yes	Write conclusion from summary of experimental observations.	46	2.9	45	4.2	47	4.4
K19	Yes	Write an example of how computers are used to do work.	85	2.2	81	3.2	90	2.1
N01	Yes	Determine correct control experiment to test hypothesis.	40	2.8	40	4.0	39	4.4
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	72	2.8	71	3.5	74	3.7
N05	Yes	Identify a principal cause of acid rain.	32	3.0	39	4.5	26	3.4
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	63	2.8	58	4.0	68	3.8
Z02A	Yes	Write a reason why not all people have enough water.	78	2.7	80	3.4	77	3.9
Z02B	Yes	Write a second reason why not all people have enough water.	47	3.0	42	4.2	52	4.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Scotland SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	61	1.7	59	2.1	64	1.8
B04	No	Predict pulse/breathing rate change after exercise.	95	0.7	95	1.1	95	0.9
C08	No	Identify carrier of signals from eye to brain.	71	1.8	71	2.1	70	2.7
D05	No	Identify system carrying sensory messages to the brain.	64	2.0	66	2.5	62	2.6
D06	No	Relate plant part to seed development.	48	1.7	52	2.0	45	2.5
E08	No	Select correct statement of trait heredity from parents.	83	1.1	79	1.5	87	1.4
E10	No	Determine characteristics for classifying animals.	56	1.9	60	2.2	52	2.5
F01	No	Identify characteristic of mammal.	48	2.1	51	2.9	45	2.5
F03	No	Identify human organ which interprets senses.	84	1.2	83	1.8	85	1.6
G08	No	Identify main function of red blood cells.	71	1.5	73	1.9	69	2.1
G09	No	Identify reproductive cells involved in heredity.	77	1.7	75	2.3	79	2.2
H01	No	Identify the functions of blood.	71	1.6	71	2.1	70	2.2
H02	No	Identify the role of vitamins.	81	1.5	81	1.9	81	2.2
I10	Yes	Identify nutrition content of fruits and vegetables.	64	3.0	61	4.2	67	4.1
I11	Yes	Know identifying features of insects.	36	3.0	46	4.3	25	3.4
I14	Yes	Relate elbow action to a simple machine.	62	2.8	59	3.8	64	4.0
I19	Yes	Identify statement of oxygen production consistent with data.	56	2.7	56	3.5	55	3.7
J02	Yes	Choose species on Earth for shortest time.	77	2.5	78	3.2	77	3.4
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	47	2.8	51	3.9	44	4.0
J09	Yes	Explain how to determine the age of a cut tree.	81	2.1	84	2.4	77	2.8
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	53	3.1	59	4.2	46	4.0
K12	Yes	Relate reproductive cell production to population.	62	3.2	65	4.3	58	4.0
K16	Yes	Identify common product made with bacteria.	25	2.7	30	3.7	18	3.2
K18	Yes	Identify main function of chloroplasts in plant cell.	49	2.7	47	3.2	50	4.2
L02	Yes	Select reason why algae are close to ocean surface.	39	2.7	43	2.9	34	4.7
L03	Yes	Identify skull features typical of predators.	65	2.8	70	3.6	59	4.1
L05	Yes	Select most likely purpose for birds' singing.	63	2.7	65	4.0	60	3.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	60	2.8	66	3.6	53	3.4
M11	Yes	Complete a food web showing energy relationships.	74	2.5	76	3.5	73	3.6
N02	Yes	Choose meal which would give the most nutrients.	36	2.4	31	3.2	41	3.7
N04	Yes	Identify how decaying fish fertilize plants.	41	2.8	43	4.2	40	3.5
N06	Yes	Identify the most basic unit of living things.	59	3.1	63	4.4	56	4.0
O16	Yes	Give reason for thirst on a hot day.	59	3.0	65	4.0	52	3.7
O17	Yes	Describe how disease may be transmitted.	59	2.9	52	3.8	67	3.6
P04	Yes	Identify what happens to animals' biological processes during hibernation.	42	2.8	43	4.0	42	4.1
P06	Yes	Describe digestion occuring in the mouth.	39	2.6	41	3.4	36	3.7
Q17	Yes	Describe the advantage of having two eyes.	65	3.1	65	4.0	66	4.1
R03	Yes	Give example of consequences of introducing new species.	13	2.1	13	2.9	12	2.8
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	25	2.4	23	2.7	27	3.0
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	54	2.3	58	3.0	49	3.4
X02B	Yes	Explain why light is important in aquarium ecosystem.	13	1.9	16	2.7	11	2.0

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Scotland SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	77	1.0	79	1.3	75	1.3
A10	No	Relate light level and reflectance to vision of object.	73	1.2	73	1.6	72	1.2
B02	No	Know type of energy released from combustion engine.	53	1.7	55	2.3	52	2.1
B03	No	Determine density from mass/volume table.	21	1.7	23	2.5	18	1.4
B06	No	Relate color of object to amount of light reflection.	83	1.3	88	1.4	78	2.2
C09	No	Identify correct position of reflected image.	86	1.2	89	1.4	84	1.8
C12	No	Identify substance which is NOT a fossil fuel.	54	1.7	57	2.4	51	2.2
D01	No	Identify correct diagram of light rays through lens.	38	1.8	45	2.3	30	2.1
D02	No	Identify substance from magnetic properties.	83	1.4	86	1.7	81	1.9
D04	No	Relate physical event to its sequence of energy changes.	74	1.5	75	2.0	72	2.1
E07	No	Identify particles found in the nucleus of atoms.	38	1.4	42	2.1	34	1.8
E11	No	Find shadow size from diagram of bulb/card/screen distances.	56	1.7	58	2.1	54	2.2
F02	No	Relate color and light reflection to temperature of object.	74	1.9	77	2.4	70	2.4
G07	No	Identify correct way to place batteries in a flashlight.	88	1.1	90	1.4	87	1.4
H05	No	Identify source of energy stored in food.	35	2.1	32	2.6	38	2.3
I16	Yes	Identify material with greatest heat conductivity.	90	1.6	86	2.6	94	1.9
J05	Yes	Identify type of solar radiation that causes sunburn.	64	3.1	68	4.1	59	4.1
K10	Yes	Describe a method demonstrating the existence of air.	30	2.7	28	3.5	32	3.7
K13	Yes	Identify electrical conductors that form complete circuits.	82	2.6	84	3.0	79	3.5
K14	Yes	Relate evaporation rate to surface area.	81	2.1	84	3.0	77	2.9
K17	Yes	Relate presence of gravitational force to position of falling object.	48	2.6	51	3.4	45	4.2
L01	Yes	Select diagram showing forces resulting in rotation.	50	3.2	56	4.2	44	4.1
L04	Yes	Explain most efficient engine.	51	2.7	50	3.9	52	4.0
L07	Yes	Relate sound transmission to air.	77	2.2	82	2.9	72	3.9
M12	Yes	Complete table of voltage/current data for circuit.	51	2.6	60	3.4	43	3.6
M14	Yes	Draw reflected image of object.	78	2.4	76	2.9	81	3.4
N08	Yes	Relate lever arm lengths to balanced weights.	64	3.1	68	3.8	60	4.4
N10	Yes	Determine effect of tipping container on water surface.	51	2.8	56	4.4	45	3.1
O10	Yes	Identify polarity of ends of cut magnet.	50	2.8	48	4.1	53	3.4
O13	Yes	Relate circular motion to centripetal force.	59	3.0	63	4.0	55	3.8
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	92	1.5	89	2.7	95	1.4
P02	Yes	Explain relationship between illuminance and distance of light source.	22	2.6	26	4.0	19	3.4
P05	Yes	Explain why balloon expands upon heating.	47	2.6	54	4.1	40	3.9
Q12	Yes	Explain how focusing affects the amount of light.	56	3.1	55	4.1	57	4.3
Q13	Yes	Compare heat expansion properties of metal and glass.	67	2.9	66	4.0	67	3.8
Q18	Yes	Explain effect of melting on the mass of ice cubes.	26	2.3	29	3.1	22	3.2
R01	Yes	Choose diagram showing angle of reflected light.	81	2.3	81	3.1	80	3.6
R02	Yes	Identify reflection/absorption properties from color.	46	2.7	50	3.5	42	3.3
Y01	Yes	Explain amount of light/electric energy in a lamp.	5	0.8	5	1.3	5	1.2
Y02	Yes	Explain temperature of melting snowball.	14	1.3	15	1.8	13	1.6

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=United States SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	83	1.1	85	1.1	80	1.3
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	81	1.1	82	1.4	80	1.5
F06	No	Relate rusting iron to the presence of oxygen and moisture.	62	1.6	63	2.2	62	1.6
G10	No	Select correct statement regarding the atomic makeup of matter.	68	1.7	71	2.1	64	2.0
H06	No	Know if wood-burning reaction absorbs or releases energy.	64	1.6	71	2.2	57	1.7
J03	Yes	Know relationship between molecules, atoms and cells.	29	1.9	35	2.6	22	2.3
J04	Yes	Distiguish between a chemical reaction and a physical change.	59	2.3	58	3.3	59	2.6
J06	Yes	Know what happens to atoms in animal after death.	42	2.0	47	3.1	38	3.0
J08	Yes	Identify gas involved in fire ignition.	27	2.0	31	3.1	22	2.6
M10	Yes	Identify substances which are mixtures.	41	2.4	38	3.1	44	3.1
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	54	2.6	57	3.0	51	3.0
N07	Yes	Explain oxygen fuel requirements of burning candle.	90	1.3	93	1.2	88	2.2
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	49	3.0	47	3.1	51	4.1
O11	Yes	Identify which change in elemental form is due to a chemical change.	42	2.1	44	2.5	39	3.2
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	47	2.7	49	3.2	44	3.0
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	53	2.2	52	3.3	54	3.3
Q15	Yes	Determine physical processes involving chemical change.	43	2.7	47	3.6	39	3.1
R05	Yes	Explain how carbon dioxide fire extinguishers work.	62	2.7	68	3.5	55	3.0
Z01A	Yes	Explain why steel bridges must be painted.	66	2.0	65	2.4	66	2.7
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	32	1.9	35	3.3	30	2.5
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	22	2.4	21	2.4	23	3.5

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=United States SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	54	1.5	55	1.6	53	1.7
B01	No	Identify hottest layer of the Earth.	92	0.6	93	0.7	91	0.8
B05	No	Use elevation/weather diagram to locate earth feature.	48	0.9	50	1.4	46	1.4
C07	No	Relate mountain shape to age.	43	1.8	45	2.0	41	1.9
D03	No	Identify direction of river flow on contour map.	46	1.8	50	2.1	42	2.2
E09	No	Use table of time/temperature to determine point when weather changes.	80	1.0	80	1.3	79	1.4
E12	No	Identify type of stone involved in cave formation.	44	1.4	46	1.7	43	1.8
F05	No	Relate level of oxygen to elevation.	90	0.8	90	1.1	91	0.9
G11	No	Identify type of rock from description of its formation.	58	1.8	57	2.4	59	1.7
H03	No	Select explanation for moonlight.	88	1.0	91	1.2	84	1.4
H04	No	Identify ground layer containing the most organic material.	38	1.3	44	1.9	32	1.5
I17	Yes	Know energy source for Earth’s water cycle.	44	2.3	43	3.0	45	3.0
J01	Yes	Know changes in Earth’s surface over billions of years.	50	2.4	49	3.1	52	2.8
K15	Yes	Know organic origins of fossil fuels.	71	2.0	71	2.9	71	2.2
O12	Yes	Know relative amounts of components in air.	20	1.8	22	2.2	16	2.5
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	56	3.0	61	2.7	50	4.6
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	86	1.7	84	2.4	89	2.0
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	52	2.6	53	3.0	51	3.2
Q16	Yes	Estimate time for light from star to reach Earth.	35	1.9	41	3.3	28	2.5
R04	Yes	Give reason why ozone layer is important for life.	52	2.7	61	3.2	42	2.9
W01A	Yes	Give reason region in land/water diagram is a good farming location.	91	0.8	90	1.1	92	1.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	58	1.7	59	2.1	57	2.4
W02	Yes	Draw diagram showing Earth’s water cycle.	40	2.3	42	2.7	37	2.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=United States SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	65	1.3	68	1.7	62	1.4
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	58	1.8	63	1.9	54	2.2
F04	No	Predict type of area where soil erosion by rain is most likely.	71	1.5	71	1.7	70	2.1
G12	No	Identify a nonrenewable natural resource.	60	1.2	64	1.9	56	2.1
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	32	2.0	31	2.6	33	2.8
I15	Yes	Identify the type of scientific statement given in an experimental report.	62	2.3	55	2.8	69	2.6
I18	Yes	Write conclusion from summary of experimental observations.	54	2.3	46	3.1	62	3.0
K19	Yes	Write an example of how computers are used to do work.	89	1.3	85	1.8	93	1.4
N01	Yes	Determine correct control experiment to test hypothesis.	47	2.5	47	2.7	47	4.1
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	75	2.0	73	2.5	77	2.3
N05	Yes	Identify a principal cause of acid rain.	32	1.7	37	2.6	26	1.9
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	61	1.9	54	3.1	69	2.5
Z02A	Yes	Write a reason why not all people have enough water.	78	2.0	74	2.7	81	2.5
Z02B	Yes	Write a second reason why not all people have enough water.	55	2.6	51	3.5	59	2.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=United States SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	76	1.1	72	1.3	81	1.3
B04	No	Predict pulse/breathing rate change after exercise.	91	0.8	90	0.9	92	1.0
C08	No	Identify carrier of signals from eye to brain.	83	1.4	84	1.5	83	1.5
D05	No	Identify system carrying sensory messages to the brain.	69	1.3	72	1.8	67	1.7
D06	No	Relate plant part to seed development.	59	1.6	61	1.8	56	2.1
E08	No	Select correct statement of trait heredity from parents.	89	0.9	87	1.3	91	1.0
E10	No	Determine characteristics for classifying animals.	58	1.9	59	2.4	58	2.1
F01	No	Identify characteristic of mammal.	59	1.4	58	1.9	60	1.7
F03	No	Identify human organ which interprets senses.	81	1.0	81	1.3	81	1.1
G08	No	Identify main function of red blood cells.	69	1.5	72	2.0	67	1.5
G09	No	Identify reproductive cells involved in heredity.	83	1.1	79	1.5	85	1.5
H01	No	Identify the functions of blood.	80	1.1	80	1.5	80	1.8
H02	No	Identify the role of vitamins.	75	1.0	72	1.6	79	1.5
I10	Yes	Identify nutrition content of fruits and vegetables.	70	1.9	67	2.3	74	2.8
I11	Yes	Know identifying features of insects.	44	2.1	48	2.7	39	2.9
I14	Yes	Relate elbow action to a simple machine.	48	2.2	47	2.9	49	2.7
I19	Yes	Identify statement of oxygen production consistent with data.	59	2.3	56	3.2	62	2.6
J02	Yes	Choose species on Earth for shortest time.	82	1.7	86	2.4	79	2.2
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	63	2.6	63	3.5	62	3.4
J09	Yes	Explain how to determine the age of a cut tree.	81	2.1	83	2.6	80	2.2
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	59	2.2	60	3.1	58	2.6
K12	Yes	Relate reproductive cell production to population.	71	2.0	70	2.7	73	2.7
K16	Yes	Identify common product made with bacteria.	42	2.7	42	3.7	41	3.1
K18	Yes	Identify main function of chloroplasts in plant cell.	54	2.3	54	3.2	53	2.8
L02	Yes	Select reason why algae are close to ocean surface.	58	2.2	59	2.6	57	2.9
L03	Yes	Identify skull features typical of predators.	75	2.0	75	3.1	76	2.4
L05	Yes	Select most likely purpose for birds' singing.	58	2.0	60	3.1	56	2.1
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	62	2.0	57	3.0	66	2.7
M11	Yes	Complete a food web showing energy relationships.	71	2.2	70	2.9	72	2.9
N02	Yes	Choose meal which would give the most nutrients.	59	2.3	56	2.6	63	3.3
N04	Yes	Identify how decaying fish fertilize plants.	51	1.8	53	2.5	49	2.7
N06	Yes	Identify the most basic unit of living things.	72	2.3	73	2.5	71	2.7
O16	Yes	Give reason for thirst on a hot day.	64	2.3	65	3.2	63	3.5
O17	Yes	Describe how disease may be transmitted.	61	2.3	56	2.6	69	3.5
P04	Yes	Identify what happens to animals' biological processes during hibernation.	57	1.9	61	2.8	53	2.9
P06	Yes	Describe digestion occuring in the mouth.	58	2.7	63	3.6	52	3.1
Q17	Yes	Describe the advantage of having two eyes.	59	2.5	64	3.0	54	3.1
R03	Yes	Give example of consequences of introducing new species.	18	2.0	19	2.7	16	2.5
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	14	1.2	10	1.2	17	1.7
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	63	1.6	63	2.1	63	2.2
X02B	Yes	Explain why light is important in aquarium ecosystem.	26	1.3	27	1.8	25	1.8

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=United States SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	80	0.9	82	0.8	78	1.2
A10	No	Relate light level and reflectance to vision of object.	77	0.8	76	1.1	78	0.9
B02	No	Know type of energy released from combustion engine.	59	1.1	59	1.6	60	1.7
B03	No	Determine density from mass/volume table.	19	0.8	22	1.2	16	1.2
B06	No	Relate color of object to amount of light reflection.	83	1.1	83	1.5	83	1.2
C09	No	Identify correct position of reflected image.	71	1.1	76	1.3	65	1.7
C12	No	Identify substance which is NOT a fossil fuel.	70	1.3	71	1.8	68	1.6
D01	No	Identify correct diagram of light rays through lens.	35	1.2	43	1.6	28	1.7
D02	No	Identify substance from magnetic properties.	74	1.2	77	1.5	72	1.7
D04	No	Relate physical event to its sequence of energy changes.	61	1.2	65	1.7	58	1.6
E07	No	Identify particles found in the nucleus of atoms.	57	1.5	55	2.4	58	1.8
E11	No	Find shadow size from diagram of bulb/card/screen distances.	54	1.4	53	1.7	55	1.8
F02	No	Relate color and light reflection to temperature of object.	60	1.5	63	2.1	57	1.7
G07	No	Identify correct way to place batteries in a flashlight.	88	0.8	89	1.2	87	1.2
H05	No	Identify source of energy stored in food.	23	1.5	24	2.0	22	1.7
I16	Yes	Identify material with greatest heat conductivity.	89	1.4	85	2.1	93	1.3
J05	Yes	Identify type of solar radiation that causes sunburn.	79	1.5	79	2.1	79	2.0
K10	Yes	Describe a method demonstrating the existence of air.	51	2.0	46	3.4	55	2.5
K13	Yes	Identify electrical conductors that form complete circuits.	78	2.0	79	2.9	77	2.7
K14	Yes	Relate evaporation rate to surface area.	79	1.6	79	2.5	79	2.0
K17	Yes	Relate presence of gravitational force to position of falling object.	64	2.2	63	3.0	65	2.7
L01	Yes	Select diagram showing forces resulting in rotation.	45	1.7	46	3.4	44	2.7
L04	Yes	Explain most efficient engine.	48	2.6	48	3.2	48	3.3
L07	Yes	Relate sound transmission to air.	65	2.6	65	3.7	64	3.1
M12	Yes	Complete table of voltage/current data for circuit.	33	1.9	39	3.6	26	2.1
M14	Yes	Draw reflected image of object.	61	1.9	62	2.5	61	3.0
N08	Yes	Relate lever arm lengths to balanced weights.	71	2.2	76	2.5	66	3.2
N10	Yes	Determine effect of tipping container on water surface.	42	2.2	53	2.9	30	3.0
O10	Yes	Identify polarity of ends of cut magnet.	58	2.4	57	2.8	59	3.4
O13	Yes	Relate circular motion to centripetal force.	63	2.1	67	2.6	58	3.6
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	87	1.8	90	2.1	83	2.3
P02	Yes	Explain relationship between illuminance and distance of light source.	27	2.5	30	3.1	23	2.5
P05	Yes	Explain why balloon expands upon heating.	43	2.3	50	3.3	35	3.2
Q12	Yes	Explain how focusing affects the amount of light.	39	2.2	41	2.9	38	3.1
Q13	Yes	Compare heat expansion properties of metal and glass.	56	3.0	58	3.3	53	4.1
Q18	Yes	Explain effect of melting on the mass of ice cubes.	32	2.3	35	3.0	29	2.6
R01	Yes	Choose diagram showing angle of reflected light.	67	1.5	69	3.1	64	2.9
R02	Yes	Identify reflection/absorption properties from color.	49	2.5	51	3.6	46	3.1
Y01	Yes	Explain amount of light/electric energy in a lamp.	3	0.4	4	0.6	2	0.6
Y02	Yes	Explain temperature of melting snowball.	25	1.6	23	2.1	27	2.3

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Slovenia SCALE=Chemistry

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A09	No	Relate fire temperature to oxygen supply.	81	1.0	82	1.3	79	1.4
C10	No	Use physical description to identify substance as solution, compound, mixture or element.	84	1.4	84	1.9	84	1.7
F06	No	Relate rusting iron to the presence of oxygen and moisture.	75	1.5	79	1.8	72	2.1
G10	No	Select correct statement regarding the atomic makeup of matter.	59	1.6	65	2.2	53	2.3
H06	No	Know if wood-burning reaction absorbs or releases energy.	61	2.1	70	2.4	53	2.7
J03	Yes	Know relationship between molecules, atoms and cells.	28	2.9	29	3.5	27	4.2
J04	Yes	Distiguish between a chemical reaction and a physical change.	52	3.0	54	4.0	49	4.6
J06	Yes	Know what happens to atoms in animal after death.	25	2.9	27	3.8	23	3.8
J08	Yes	Identify gas involved in fire ignition.	71	2.7	69	3.8	73	3.2
M10	Yes	Identify substances which are mixtures.	55	2.6	54	4.0	55	4.0
M13	Yes	Know if oil-burning reaction absorbs or releases energy.	48	2.7	53	4.0	43	3.8
N07	Yes	Explain oxygen fuel requirements of burning candle.	99	0.4	100	0.0	99	0.8
N09	Yes	Choose materials that can be separated using a funnel lined with filter paper.	60	2.8	61	4.5	59	3.9
O11	Yes	Identify which change in elemental form is due to a chemical change.	35	2.7	38	4.0	32	3.9
O15	Yes	Relate the loss of an electron from a netural atom to ion formation.	80	2.1	81	2.9	80	2.9
Q14	Yes	Identify type of substance formed by heating a mixture of two elemental powders.	52	2.9	57	3.9	46	4.3
Q15	Yes	Determine physical processes involving chemical change.	22	2.6	23	3.6	21	3.6
R05	Yes	Explain how carbon dioxide fire extinguishers work.	52	3.2	60	3.9	44	4.1
Z01A	Yes	Explain why steel bridges must be painted.	77	2.6	79	3.4	75	3.9
Z01B	Yes	Describe a consequence of using longer-lasting paint on bridge requiring year-round painting.	41	3.1	46	3.4	37	4.4
Z01C	Yes	Describe second consequence of using longer-lasting paint on bridge requiring year-round painting.	29	3.0	31	3.9	27	3.9

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Slovenia SCALE=Earth Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A12	No	Predict how river shape/speed changes due to terrain.	74	1.3	78	1.5	69	1.5
B01	No	Identify hottest layer of the Earth.	95	0.6	97	0.6	94	1.0
B05	No	Use elevation/weather diagram to locate earth feature.	66	1.6	67	1.8	66	2.3
C07	No	Relate mountain shape to age.	50	2.2	58	3.2	43	2.6
D03	No	Identify direction of river flow on contour map.	58	2.0	67	2.6	50	2.8
E09	No	Use table of time/temperature to determine point when weather changes.	86	1.1	86	1.6	86	1.5
E12	No	Identify type of stone involved in cave formation.	96	0.7	95	0.9	96	1.1
F05	No	Relate level of oxygen to elevation.	87	1.0	86	1.6	88	1.3
G11	No	Identify type of rock from description of its formation.	62	2.4	58	2.9	65	2.6
H03	No	Select explanation for moonlight.	82	1.5	88	1.7	77	2.1
H04	No	Identify ground layer containing the most organic material.	80	1.4	85	1.7	76	2.3
I17	Yes	Know energy source for Earth’s water cycle.	36	3.1	38	4.4	34	4.0
J01	Yes	Know changes in Earth’s surface over billions of years.	42	3.3	38	4.3	45	4.6
K15	Yes	Know organic origins of fossil fuels.	82	2.4	84	3.7	80	3.4
O12	Yes	Know relative amounts of components in air.	31	3.2	38	4.6	23	3.3
O14	Yes	Explain relative size of Sun and Moon as viewed from Earth.	60	3.0	75	3.5	46	4.0
P03	Yes	Give reason why planet would be uninhabitable from physical data table.	88	1.8	87	2.8	89	2.2
Q11	Yes	Choose statement explaining Earth’s day/night cycle.	53	2.6	55	3.7	51	3.8
Q16	Yes	Estimate time for light from star to reach Earth.	39	3.2	40	4.0	38	4.3
R04	Yes	Give reason why ozone layer is important for life.	61	2.8	67	3.7	55	4.1
W01A	Yes	Give reason region in land/water diagram is a good farming location.	90	1.2	91	1.5	89	2.0
W01B	Yes	Give reason region in land/water diagram is NOT a good farming location.	49	2.1	49	3.1	50	2.6
W02	Yes	Draw diagram showing Earth’s water cycle.	24	1.9	28	2.8	21	2.4

REL: Release Status (Yes= Item in Released Item Set)

Percent Correct on the Science Items - Eighth Grade

COUNTRY ID=Slovenia SCALE=Environment and other content

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A11	No	Identify major problem of overgrazing livestock.	65	1.5	70	2.0	61	1.9
C11	No	Predict environmental effect of increased carbon dioxide in atmosphere.	36	2.0	45	2.7	28	2.3
F04	No	Predict type of area where soil erosion by rain is most likely.	77	1.4	81	1.8	73	2.0
G12	No	Identify a nonrenewable natural resource.	46	1.8	46	2.4	46	2.5
I12	Yes	Determine which set of trials to include in a controlled scientific experiment.	43	3.0	46	4.4	42	4.4
I13	Yes	Select best scale for accurate measurement.	76	2.2	79	3.3	73	3.4
I15	Yes	Identify the type of scientific statement given in an experimental report.	69	2.9	69	4.3	70	3.4
I18	Yes	Write conclusion from summary of experimental observations.	37	3.2	37	4.6	38	3.9
K19	Yes	Write an example of how computers are used to do work.	83	2.4	85	3.0	80	3.2
N01	Yes	Determine correct control experiment to test hypothesis.	41	2.9	38	4.0	45	4.2
N03	Yes	Select conclusion shown from experiment comparing liquid evaporation rates.	77	2.7	81	2.9	74	3.4
N05	Yes	Identify a principal cause of acid rain.	55	3.4	57	4.6	53	4.0
P07	Yes	Select statement best describing the precision of repeated scientific measurements.	73	2.7	69	3.6	78	3.5
Z02A	Yes	Write a reason why not all people have enough water.	61	3.2	59	4.4	62	3.7
Z02B	Yes	Write a second reason why not all people have enough water.	39	3.1	37	4.3	41	3.6

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Slovenia SCALE=Life Science

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A07	No	Identify location of organs in the body.	82	1.1	81	1.4	84	1.3
B04	No	Predict pulse/breathing rate change after exercise.	95	0.6	95	0.8	95	1.0
C08	No	Identify carrier of signals from eye to brain.	76	1.6	78	2.0	74	2.4
D05	No	Identify system carrying sensory messages to the brain.	81	1.3	81	1.8	80	1.8
D06	No	Relate plant part to seed development.	88	1.1	87	1.7	88	1.5
E08	No	Select correct statement of trait heredity from parents.	89	1.2	87	1.7	90	1.4
E10	No	Determine characteristics for classifying animals.	54	1.8	57	2.4	51	2.5
F01	No	Identify characteristic of mammal.	91	1.1	89	1.4	92	1.3
F03	No	Identify human organ which interprets senses.	44	1.8	50	2.2	38	2.4
G08	No	Identify main function of red blood cells.	52	1.9	56	2.2	48	2.5
G09	No	Identify reproductive cells involved in heredity.	76	1.5	73	2.1	78	1.6
H01	No	Identify the functions of blood.	74	1.7	76	2.2	71	2.3
H02	No	Identify the role of vitamins.	91	0.9	91	1.4	90	1.1
I10	Yes	Identify nutrition content of fruits and vegetables.	96	1.1	96	1.7	96	1.6
I11	Yes	Know identifying features of insects.	45	3.2	48	4.5	41	3.8
I14	Yes	Relate elbow action to a simple machine.	38	2.9	47	4.4	29	3.8
I19	Yes	Identify statement of oxygen production consistent with data.	60	2.8	64	3.2	57	4.3
J02	Yes	Choose species on Earth for shortest time.	53	3.1	57	3.8	49	4.1
J07	Yes	Identify how warm-blooded and cold-blooded animals differ.	67	3.0	67	4.1	68	4.2
J09	Yes	Explain how to determine the age of a cut tree.	90	1.6	91	1.9	90	2.4
K11	Yes	Identify oxygen/carbon dioxide cycle in aquarium.	67	2.6	69	3.7	65	3.7
K12	Yes	Relate reproductive cell production to population.	45	3.2	47	4.0	44	4.2
K16	Yes	Identify common product made with bacteria.	39	3.0	35	3.9	42	4.1
K18	Yes	Identify main function of chloroplasts in plant cell.	72	3.1	70	4.5	74	4.3
L02	Yes	Select reason why algae are close to ocean surface.	72	3.0	81	3.3	64	4.2
L03	Yes	Identify skull features typical of predators.	82	2.2	83	3.0	81	3.2
L05	Yes	Select most likely purpose for birds' singing.	79	2.4	81	3.3	77	3.6
L06	Yes	Compare cold-weather activity of warm-blooded and cold-blooded animals.	64	2.9	64	4.2	64	3.8
M11	Yes	Complete a food web showing energy relationships.	70	2.6	69	3.9	70	3.5
N02	Yes	Choose meal which would give the most nutrients.	32	3.0	27	3.6	37	4.2
N04	Yes	Identify how decaying fish fertilize plants.	51	3.3	51	4.4	51	4.2
N06	Yes	Identify the most basic unit of living things.	75	2.8	76	3.6	75	4.0
O16	Yes	Give reason for thirst on a hot day.	72	2.6	74	3.6	71	3.2
O17	Yes	Describe how disease may be transmitted.	58	3.0	57	3.8	60	4.4
P04	Yes	Identify what happens to animals' biological processes during hibernation.	71	2.6	77	3.8	66	3.9
P06	Yes	Describe digestion occuring in the mouth.	51	3.1	55	4.6	48	4.0
Q17	Yes	Describe the advantage of having two eyes.	68	3.3	65	3.9	71	4.6
R03	Yes	Give example of consequences of introducing new species.	16	2.5	21	3.4	12	2.7
X01	Yes	Describe materials and procedures used in exercise/heart-rate investigation.	20	1.9	21	2.6	19	2.1
X02A	Yes	Explain why a plant is important in aquarium ecosystem.	74	2.0	74	2.7	73	2.7
X02B	Yes	Explain why light is important in aquarium ecosystem.	45	2.2	48	3.2	43	2.8

REL: Release Status (Yes= Item in Released Item Set)

COUNTRY ID=Slovenia SCALE=Physics

			Eighth Grade					
			Overall		Boys		Girls	
ITEM	REL	LABEL	%	(se)	%	(se)	%	(se)
A08	No	Compare stored energy of two compressed springs.	75	1.0	79	1.4	71	1.5
A10	No	Relate light level and reflectance to vision of object.	82	1.0	83	1.1	81	1.5
B02	No	Know type of energy released from combustion engine.	66	1.5	69	2.2	62	2.0
B03	No	Determine density from mass/volume table.	36	1.7	42	2.5	30	1.9
B06	No	Relate color of object to amount of light reflection.	91	1.1	93	1.1	89	1.5
C09	No	Identify correct position of reflected image.	70	1.7	76	2.4	64	2.3
C12	No	Identify substance which is NOT a fossil fuel.	61	1.8	60	2.6	62	2.9
D01	No	Identify correct diagram of light rays through lens.	43	2.1	54	2.8	33	2.7
D02	No	Identify substance from magnetic properties.	85	1.2	88	1.4	81	1.7
D04	No	Relate physical event to its sequence of energy changes.	63	1.7	72	2.2	55	2.4
E07	No	Identify particles found in the nucleus of atoms.	58	2.0	55	2.6	61	2.7
E11	No	Find shadow size from diagram of bulb/card/screen distances.	61	1.7	64	2.3	59	2.4
F02	No	Relate color and light reflection to temperature of object.	84	1.2	85	1.6	83	1.5
G07	No	Identify correct way to place batteries in a flashlight.	93	0.8	96	0.9	91	1.2
H05	No	Identify source of energy stored in food.	13	1.3	13	1.8	14	1.6
I16	Yes	Identify material with greatest heat conductivity.	76	2.7	81	3.1	71	3.7
J05	Yes	Identify type of solar radiation that causes sunburn.	82	2.2	83	3.0	81	3.3
K10	Yes	Describe a method demonstrating the existence of air.	26	2.5	26	3.5	26	3.4
K13	Yes	Identify electrical conductors that form complete circuits.	88	1.7	91	2.2	86	2.6
K14	Yes	Relate evaporation rate to surface area.	87	1.7	90	2.4	85	2.9
K17	Yes	Relate presence of gravitational force to position of falling object.	57	2.9	52	3.6	61	4.0
L01	Yes	Select diagram showing forces resulting in rotation.	56	2.9	67	4.2	45	4.0
L04	Yes	Explain most efficient engine.	52	2.7	56	3.6	48	3.6
L07	Yes	Relate sound transmission to air.	76	2.5	83	3.1	70	3.8
M12	Yes	Complete table of voltage/current data for circuit.	64	2.6	68	3.4	61	4.1
M14	Yes	Draw reflected image of object.	71	2.3	72	3.3	70	3.5
N08	Yes	Relate lever arm lengths to balanced weights.	75	2.2	80	3.4	70	3.5
N10	Yes	Determine effect of tipping container on water surface.	65	2.6	75	4.2	56	3.2
O10	Yes	Identify polarity of ends of cut magnet.	54	2.7	60	3.5	48	4.2
O13	Yes	Relate circular motion to centripetal force.	66	3.0	69	3.6	62	4.0
P01	Yes	Extrapolate distance/time graph to determine distance travelled at fixed speed.	92	1.4	93	1.8	91	2.1
P02	Yes	Explain relationship between illuminance and distance of light source.	27	2.7	34	4.2	19	2.6
P05	Yes	Explain why balloon expands upon heating.	65	2.4	67	3.6	63	4.0
Q12	Yes	Explain how focusing affects the amount of light.	52	2.9	60	4.3	44	3.8
Q13	Yes	Compare heat expansion properties of metal and glass.	66	3.0	70	3.8	62	4.2
Q18	Yes	Explain effect of melting on the mass of ice cubes.	38	2.9	42	3.9	35	4.1
R01	Yes	Choose diagram showing angle of reflected light.	74	2.7	72	3.5	75	4.1
R02	Yes	Identify reflection/absorption properties from color.	35	3.0	34	4.0	37	4.4
Y01	Yes	Explain amount of light/electric energy in a lamp.	18	1.9	23	2.8	13	2.2
Y02	Yes	Explain temperature of melting snowball.	13	1.6	16	2.3	11	1.7

REL: Release Status (Yes= Item in Released Item Set)