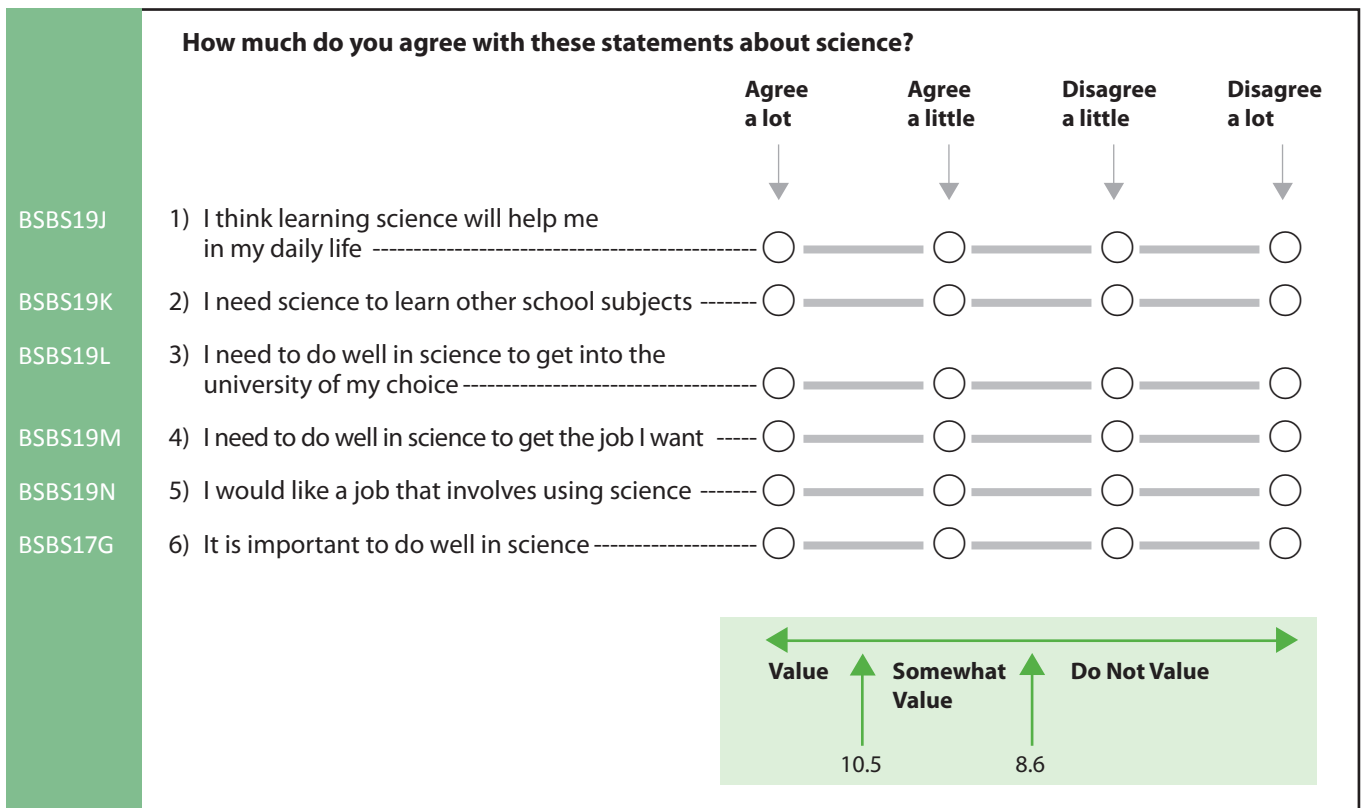


# TIMSS 2011

## The TIMSS 2011 Students Value Science Scale, Eighth Grade

The Students Value Science (SVS) scale was created based on students' degree of agreement to the six statements described below. See [Creating and Interpreting TIMSS and PIRLS 2011 Context Questionnaire Scales](#) for more information on how the scales were formed.

Exhibit 1: Items in the TIMSS 2011 Students Value Science Scale, Eighth Grade



**Exhibit 2: Item Parameters for the TIMSS 2011 Students Value Science Scale, Eighth Grade**

| Item    | delta    | tau_1    | tau_2    | tau_3   |
|---------|----------|----------|----------|---------|
| BSBS19J | -1.86291 | -1.31772 | -0.40709 | 1.72481 |
| BSBS19K | -1.15063 | -1.84346 | -0.00645 | 1.84991 |
| BSBS19L | -1.58210 | -1.34163 | 0.00913  | 1.33250 |
| BSBS19M | -1.22846 | -1.40722 | 0.16601  | 1.24121 |
| BSBS19N | -0.38015 | -1.27454 | 0.03926  | 1.23528 |
| BSBS17G | -2.19301 | -1.22498 | -0.30686 | 1.53184 |

**Exhibit 3: Scale Transformation Constants**

Scale Transformation Constants

A = 10.08528

B = 1.09123

Transformed Scale Score = 10.08528 + 1.09123 • Logit Scale Score

**Exhibit 4: Equivalence Table of the Raw Score and the Transformed Scale Score**

| Raw Score | Transformed Scale Score | Cutpoint | Raw Score | Transformed Scale Score | Cutpoint |
|-----------|-------------------------|----------|-----------|-------------------------|----------|
| 0         | 4.13635                 |          | 10        | 8.84836                 |          |
| 1         | 5.40984                 |          | 11        | 9.15956                 |          |
| 2         | 6.05617                 |          | 12        | 9.47921                 |          |
| 3         | 6.52660                 |          | 13        | 9.81631                 |          |
| 4         | 6.91883                 |          | 14        | 10.17921                |          |
| 5         | 7.27088                 |          | 15        | 10.59285                | 10.5     |
| 6         | 7.60129                 |          | 16        | 11.09147                |          |
| 7         | 7.91985                 |          | 17        | 11.77902                |          |
| 8         | 8.23142                 |          | 18        | 13.10324                |          |
| 9         | 8.54023                 | 8.6      |           |                         |          |

**Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Value Science Scale, Eighth Grade**

| Country               | Cronbach's Alpha Reliability Coefficient | Percent of Variance Explained | Factor Loadings for Each Item |         |         |         |         |         |
|-----------------------|--|-------------------------------|-------------------------------|---------|---------|---------|---------|---------|
|                       |  |                               | BSBS19J                       | BSBS19K | BSBS19L | BSBS19M | BSBS19N | BSBS17G |
| Australia             | 0.91                                     | 70                            | 0.85                          | 0.81    | 0.88    | 0.87    | 0.80    | 0.79    |
| Bahrain               | 0.87                                     | 62                            | 0.79                          | 0.77    | 0.85    | 0.85    | 0.75    | 0.69    |
| Chile                 | 0.85                                     | 57                            | 0.76                          | 0.70    | 0.84    | 0.85    | 0.73    | 0.66    |
| Chinese Taipei        | 0.89                                     | 65                            | 0.79                          | 0.78    | 0.84    | 0.86    | 0.78    | 0.77    |
| England               | 0.87                                     | 62                            | 0.81                          | 0.76    | 0.82    | 0.84    | 0.74    | 0.74    |
| Ghana                 | 0.77                                     | 48                            | 0.70                          | 0.63    | 0.76    | 0.78    | 0.66    | 0.61    |
| Hong Kong SAR         | 0.89                                     | 64                            | 0.75                          | 0.79    | 0.86    | 0.86    | 0.78    | 0.75    |
| Iran, Islamic Rep. of | 0.82                                     | 53                            | 0.68                          | 0.71    | 0.84    | 0.84    | 0.78    | 0.43    |
| Israel                | 0.90                                     | 67                            | 0.83                          | 0.84    | 0.86    | 0.87    | 0.76    | 0.75    |
| Italy                 | 0.84                                     | 56                            | 0.74                          | 0.70    | 0.77    | 0.81    | 0.76    | 0.68    |
| Japan                 | 0.85                                     | 58                            | 0.74                          | 0.75    | 0.81    | 0.84    | 0.70    | 0.71    |

**Exhibit 5: Cronbach's Alpha Reliability Coefficient and Principal Components Analysis of the Items in the TIMSS 2011 Students Value Science Scale, Eighth Grade (Continued)**

| Country                          | Cronbach's Alpha Reliability Coefficient | Percent of Variance Explained | Factor Loadings for Each Item |         |         |         |         |         |
|----------------------------------|--|-------------------------------|-------------------------------|---------|---------|---------|---------|---------|
|                                  |  |                               | BSBS19J                       | BSBS19K | BSBS19L | BSBS19M | BSBS19N | BSBS17G |
| Jordan                           | 0.80                                     | 52                            | 0.71                          | 0.75    | 0.80    | 0.79    | 0.63    | 0.62    |
| Korea, Rep. of                   | 0.88                                     | 62                            | 0.76                          | 0.79    | 0.85    | 0.85    | 0.72    | 0.75    |
| Malaysia                         | 0.87                                     | 61                            | 0.75                          | 0.71    | 0.85    | 0.85    | 0.77    | 0.76    |
| New Zealand                      | 0.90                                     | 67                            | 0.85                          | 0.81    | 0.85    | 0.85    | 0.78    | 0.76    |
| Norway                           | 0.88                                     | 63                            | 0.79                          | 0.74    | 0.87    | 0.87    | 0.75    | 0.72    |
| Oman                             | 0.78                                     | 49                            | 0.69                          | 0.70    | 0.78    | 0.78    | 0.65    | 0.58    |
| Palestinian Nat'l Auth.          | 0.82                                     | 54                            | 0.74                          | 0.76    | 0.80    | 0.79    | 0.62    | 0.68    |
| Qatar                            | 0.88                                     | 63                            | 0.81                          | 0.77    | 0.86    | 0.85    | 0.73    | 0.73    |
| Saudi Arabia                     | 0.83                                     | 55                            | 0.72                          | 0.74    | 0.83    | 0.81    | 0.69    | 0.65    |
| Singapore                        | 0.87                                     | 61                            | 0.77                          | 0.73    | 0.84    | 0.84    | 0.76    | 0.73    |
| Thailand                         | 0.83                                     | 55                            | 0.73                          | 0.69    | 0.80    | 0.82    | 0.69    | 0.70    |
| Tunisia                          | 0.83                                     | 55                            | 0.69                          | 0.74    | 0.83    | 0.82    | 0.72    | 0.62    |
| Turkey                           | 0.82                                     | 53                            | 0.62                          | 0.73    | 0.82    | 0.84    | 0.74    | 0.59    |
| United Arab Emirates             | 0.86                                     | 60                            | 0.78                          | 0.73    | 0.84    | 0.84    | 0.75    | 0.69    |
| United States                    | 0.87                                     | 62                            | 0.82                          | 0.77    | 0.81    | 0.84    | 0.74    | 0.73    |
| <b>Ninth Grade Participants</b>  |  |                               |                               |         |         |         |         |         |
| Botswana                         | 0.77                                     | 48                            | 0.70                          | 0.61    | 0.74    | 0.74    | 0.66    | 0.68    |
| Honduras                         | –  | –                             | –                             | –       | –       | –       | –       | –       |
| South Africa                     | 0.86                                     | 59                            | 0.75                          | 0.71    | 0.84    | 0.84    | 0.78    | 0.68    |
| <b>Benchmarking Participants</b> |  |                               |                               |         |         |         |         |         |
| Alberta, Canada                  | 0.89                                     | 65                            | 0.82                          | 0.76    | 0.86    | 0.86    | 0.79    | 0.73    |
| Ontario, Canada                  | 0.89                                     | 65                            | 0.82                          | 0.76    | 0.86    | 0.86    | 0.79    | 0.74    |
| Quebec, Canada                   | 0.88                                     | 63                            | 0.81                          | 0.76    | 0.84    | 0.85    | 0.75    | 0.75    |
| Abu Dhabi, UAE                   | 0.85                                     | 59                            | 0.77                          | 0.73    | 0.83    | 0.84    | 0.74    | 0.67    |
| Dubai, UAE                       | 0.87                                     | 61                            | 0.79                          | 0.73    | 0.85    | 0.85    | 0.77    | 0.70    |
| Alabama, US                      | 0.86                                     | 60                            | 0.82                          | 0.74    | 0.81    | 0.84    | 0.72    | 0.71    |
| California, US                   | 0.87                                     | 61                            | 0.82                          | 0.76    | 0.81    | 0.83    | 0.72    | 0.71    |
| Colorado, US                     | 0.88                                     | 63                            | 0.82                          | 0.77    | 0.83    | 0.84    | 0.75    | 0.74    |
| Connecticut, US                  | 0.87                                     | 61                            | 0.82                          | 0.76    | 0.80    | 0.84    | 0.73    | 0.72    |
| Florida, US                      | 0.86                                     | 59                            | 0.82                          | 0.76    | 0.80    | 0.83    | 0.72    | 0.70    |
| Indiana, US                      | 0.89                                     | 64                            | 0.84                          | 0.79    | 0.83    | 0.85    | 0.75    | 0.75    |
| Massachusetts, US                | 0.86                                     | 60                            | 0.80                          | 0.74    | 0.80    | 0.85    | 0.74    | 0.70    |
| Minnesota, US                    | 0.88                                     | 63                            | 0.83                          | 0.77    | 0.81    | 0.85    | 0.75    | 0.75    |
| North Carolina, US               | 0.87                                     | 62                            | 0.82                          | 0.74    | 0.82    | 0.84    | 0.75    | 0.74    |

A dash (–) indicates that the item was not administered or comparable data was not available.

**Exhibit 6: Relationship Between the TIMSS 2011 Students Value Science Scale, Eighth Grade, and TIMSS 2011 Science Achievement**

| Country                         | Pearson's Correlation with Science Achievement |                   | Variance in Science Achievement Accounted for by Difference Between Regions of the Scale ( $\eta^2$ ) |
|---------------------------------|--|-------------------|---|
|                                 | (r)  | (r <sup>2</sup> ) |   |
| Australia                       | 0.32   | 0.10              | 0.09  |
| Bahrain                         | 0.20   | 0.04              | 0.03  |
| Chile                           | 0.04   | 0.00              | 0.00  |
| Chinese Taipei                  | 0.37   | 0.14              | 0.10  |
| England                         | 0.18   | 0.03              | 0.02  |
| Ghana                           | 0.28   | 0.08              | 0.06  |
| Hong Kong SAR                   | 0.23   | 0.05              | 0.04  |
| Iran, Islamic Rep. of           | 0.04   | 0.00              | 0.00  |
| Israel                          | 0.14   | 0.02              | 0.02  |
| Italy                           | 0.20   | 0.04              | 0.03  |
| Japan                           | 0.34   | 0.11              | 0.07  |
| Jordan                          | 0.20   | 0.04              | 0.04  |
| Korea, Rep. of                  | 0.38   | 0.15              | 0.11  |
| Malaysia                        | 0.34   | 0.11              | 0.09  |
| New Zealand                     | 0.15   | 0.02              | 0.02  |
| Norway                          | 0.13   | 0.02              | 0.01  |
| Oman                            | 0.26   | 0.07              | 0.06  |
| Palestinian Nat'l Auth.         | 0.20   | 0.04              | 0.04  |
| Qatar                           | 0.24   | 0.06              | 0.05  |
| Saudi Arabia                    | 0.14   | 0.02              | 0.01  |
| Singapore                       | 0.26   | 0.07              | 0.07  |
| Thailand                        | 0.19   | 0.04              | 0.03  |
| Tunisia                         | 0.05   | 0.00              | 0.00  |
| Turkey                          | 0.15   | 0.02              | 0.02  |
| United Arab Emirates            | 0.11   | 0.01              | 0.01  |
| United States                   | 0.20   | 0.04              | 0.04  |
| <b>International Median</b>     | <b>0.20</b>                                    | <b>0.04</b>       | <b>0.04</b>   |
| <b>Ninth Grade Participants</b> |  |                   |   |
| Botswana                        | 0.37   | 0.14              | 0.14  |
| Honduras                        | –  | –                 | –   |
| South Africa                    | 0.03   | 0.00              | 0.01  |

**Exhibit 6: Relationship Between the TIMSS 2011 Students Value Science Scale, Eighth Grade, and TIMSS 2011 Science Achievement (Continued)**

| Country                          | Pearson's Correlation with Science Achievement |                   | Variance in Science Achievement Accounted for by Difference Between Regions of the Scale ( $\eta^2$ ) |
|----------------------------------|--|-------------------|---|
|                                  | (r)  | (r <sup>2</sup> ) |   |
| <b>Benchmarking Participants</b> |  |                   |   |
| Alberta, Canada                  | 0.20   | 0.04              | 0.03  |
| Ontario, Canada                  | 0.23   | 0.05              | 0.05  |
| Quebec, Canada                   | 0.21   | 0.05              | 0.05  |
| Abu Dhabi, UAE                   | 0.12   | 0.01              | 0.01  |
| Dubai, UAE                       | 0.09   | 0.01              | 0.01  |
| Alabama, US                      | 0.10   | 0.01              | 0.01  |
| California, US                   | 0.14   | 0.02              | 0.02  |
| Colorado, US                     | 0.16   | 0.03              | 0.02  |
| Connecticut, US                  | 0.17   | 0.03              | 0.03  |
| Florida, US                      | 0.26   | 0.07              | 0.04  |
| Indiana, US                      | 0.23   | 0.05              | 0.05  |
| Massachusetts, US                | 0.21   | 0.04              | 0.04  |
| Minnesota, US                    | 0.26   | 0.07              | 0.06  |
| North Carolina, US               | 0.23   | 0.05              | 0.05  |

A dash (-) indicates that the item was not administered or comparable data was not available.