

## Appendix 17A: Characteristics of the eTIMSS 2019 with Problem Solving and Inquiry Samples

### Target Population Coverage – eTIMSS 2019 with Problem Solving and Inquiry—Grade 4

| Country                         | International Target Population |   | Exclusions from National Target Population |                          |                    |
|---------------------------------|---------------------------------|---|--|--------------------------|--------------------|
|                                 | Coverage                        | Notes on Coverage   | School-Level Exclusions                    | Within-Sample Exclusions | Overall Exclusions |
| Austria                         | 100%                            |   | 0.9%                                       | 4.5%                     | 5.4%               |
| <sup>1,2</sup> Canada           | 79%                             | Students from the provinces of Alberta, Manitoba, Newfoundland, Ontario, and Quebec | 3.1%                                       | 3.9%                     | 7.0%               |
| Chile                           | 100%                            |   | 1.2%                                       | 2.6%                     | 3.8%               |
| Chinese Taipei                  | 100%                            |   | 0.3%                                       | 1.6%                     | 2.0%               |
| Croatia                         | 100%                            |   | 1.1%                                       | 3.1%                     | 4.2%               |
| Czech Republic                  | 100%                            |   | 2.5%                                       | 2.2%                     | 4.7%               |
| Denmark                         | 100%                            |   | 1.6%                                       | 1.5%                     | 3.1%               |
| <sup>2</sup> England            | 100%                            |   | 2.2%                                       | 3.6%                     | 5.8%               |
| Finland                         | 100%                            |   | 1.8%                                       | 1.5%                     | 3.3%               |
| France                          | 100%                            |   | 2.5%                                       | 1.9%                     | 4.4%               |
| <sup>1</sup> Georgia            | 92%                             | Students taught in Georgian   | 2.8%                                       | 1.8%                     | 4.7%               |
| Germany                         | 100%                            |   | 1.7%                                       | 2.2%                     | 3.9%               |
| Hong Kong SAR                   | 100%                            |   | 1.1%                                       | 2.4%                     | 3.5%               |
| Hungary                         | 100%                            |   | 2.1%                                       | 2.0%                     | 4.1%               |
| Italy                           | 100%                            |   | 0.9%                                       | 4.1%                     | 4.9%               |
| Korea, Rep. of                  | 100%                            |   | 0.9%                                       | 1.5%                     | 2.3%               |
| <sup>2</sup> Lithuania          | 100%                            |   | 2.6%                                       | 4.1%                     | 6.7%               |
| Malta                           | 100%                            |   | 1.4%                                       | 3.1%                     | 4.5%               |
| Netherlands                     | 100%                            |   | 2.6%                                       | 0.9%                     | 3.5%               |
| Norway (5)                      | 100%                            |   | 1.4%                                       | 3.3%                     | 4.7%               |
| <sup>2</sup> Portugal           | 100%                            |   | 0.9%                                       | 6.9%                     | 7.8%               |
| Qatar                           | 100%                            |   | 1.2%                                       | 1.0%                     | 2.2%               |
| <sup>2</sup> Russian Federation | 100%                            |   | 2.4%                                       | 3.9%                     | 6.3%               |
| <sup>3</sup> Singapore          | 100%                            |   | 12.5%                                      | 0.4%                     | 12.8%              |
| <sup>2</sup> Slovak Republic    | 100%                            |   | 3.6%                                       | 1.9%                     | 5.5%               |
| Spain                           | 100%                            |   | 1.6%                                       | 3.8%                     | 5.4%               |
| Sweden                          | 100%                            |   | 1.6%                                       | 3.8%                     | 5.4%               |
| <sup>2</sup> Turkey (5)         | 100%                            |   | 1.0%                                       | 5.9%                     | 7.0%               |
| United Arab Emirates            | 100%                            |   | 1.1%                                       | 2.0%                     | 3.2%               |
| <sup>2</sup> United States      | 100%                            |   | 0.0%                                       | 7.2%                     | 7.2%               |

#### Benchmarking Participants

|                              |      |  |      |      |      |
|------------------------------|------|--|------|------|------|
| <sup>2</sup> Ontario, Canada | 100% |  | 2.3% | 4.7% | 7.0% |
| Quebec, Canada               | 100% |  | 3.3% | 1.2% | 4.4% |
| Moscow City, Russian Fed.    | 100% |  | 0.7% | 1.4% | 2.1% |
| Madrid, Spain                | 100% |  | 0.5% | 3.1% | 3.6% |
| Abu Dhabi, UAE               | 100% |  | 1.1% | 2.5% | 3.6% |
| <sup>2</sup> Dubai, UAE      | 100% |  | 2.6% | 3.0% | 5.6% |

1 National Target Population does not include all of the International Target Population.

2 National Defined Population covers 90% to 95% of National Target Population.

3 National Defined Population covers less than 90% of National Target Population (but at least 77%).

## Target Population Coverage – eTIMSS 2019 with Problem Solving and Inquiry—Grade 8

| Country                          | International Target Population |                             | Exclusions from National Target Population |                          |                    |
|----------------------------------|---------------------------------|-----------------------------|--|--------------------------|--------------------|
|                                  | Coverage                        | Notes on Coverage           | School-Level Exclusions                    | Within-Sample Exclusions | Overall Exclusions |
| Chile                            | 100%                            |                             | 0.3%                                       | 1.9%                     | 2.2%               |
| Chinese Taipei                   | 100%                            |                             | 0.1%                                       | 1.3%                     | 1.5%               |
| England                          | 100%                            |                             | 2.9%                                       | 2.0%                     | 4.8%               |
| Finland                          | 100%                            |                             | 1.5%                                       | 1.5%                     | 3.1%               |
| France                           | 100%                            |                             | 2.8%                                       | 1.0%                     | 3.8%               |
| <sup>1</sup> Georgia             | 91%                             | Students taught in Georgian | 2.2%                                       | 2.1%                     | 4.3%               |
| Hong Kong SAR                    | 100%                            |                             | 1.2%                                       | 2.1%                     | 3.3%               |
| Hungary                          | 100%                            |                             | 2.5%                                       | 1.9%                     | 4.4%               |
| <sup>3</sup> Israel              | 100%                            |                             | 19.5%                                      | 3.8%                     | 23.2%              |
| Italy                            | 100%                            |                             | 0.8%                                       | 3.6%                     | 4.3%               |
| Korea, Rep. of                   | 100%                            |                             | 0.7%                                       | 0.9%                     | 1.6%               |
| Lithuania                        | 100%                            |                             | 3.2%                                       | 2.0%                     | 5.3%               |
| Malaysia                         | 100%                            |                             | 1.9%                                       | 1.3%                     | 3.2%               |
| Norway (9)                       | 100%                            |                             | 1.4%                                       | 2.5%                     | 4.0%               |
| Portugal                         | 100%                            |                             | 1.0%                                       | 4.5%                     | 5.5%               |
| Qatar                            | 100%                            |                             | 1.3%                                       | 0.9%                     | 2.2%               |
| <sup>2</sup> Russian Federation  | 100%                            |                             | 2.8%                                       | 2.9%                     | 5.7%               |
| <sup>2</sup> Singapore           | 100%                            |                             | 10.1%                                      | 0.2%                     | 10.3%              |
| <sup>2</sup> Sweden              | 100%                            |                             | 1.7%                                       | 4.6%                     | 6.3%               |
| Turkey                           | 100%                            |                             | 1.1%                                       | 2.4%                     | 3.4%               |
| United Arab Emirates             | 100%                            |                             | 1.1%                                       | 1.3%                     | 2.4%               |
| United States                    | 100%                            |                             | 0.0%                                       | 3.9%                     | 3.9%               |
| <b>Benchmarking Participants</b> |                                 |                             |  |                          |                    |
| Ontario, Canada                  | 100%                            |                             | 2.1%                                       | 3.4%                     | 5.5%               |
| Quebec, Canada                   | 100%                            |                             | 3.3%                                       | 0.9%                     | 4.2%               |
| Moscow City, Russian Fed.        | 100%                            |                             | 0.7%                                       | 0.8%                     | 1.5%               |
| Abu Dhabi, UAE                   | 100%                            |                             | 0.9%                                       | 0.8%                     | 1.7%               |
| <sup>2</sup> Dubai, UAE          | 100%                            |                             | 3.0%                                       | 2.5%                     | 5.5%               |

1 National Target Population does not include all of the International Target Population.

2 National Defined Population covers 90% to 95% of National Target Population.

3 National Defined Population covers less than 90% of National Target Population (but at least 77%).

## Target Population and Sample Sizes – eTIMSS 2019 with Problem Solving and Inquiry—Grade 4

| Country              | Population |           | Sample  |          |   |
|----------------------|------------|-----------|---------|----------|---|
|                      | Schools    | Students  | Schools | Students | Student Population Size Estimated from Sample |
| Austria              | 3,095      | 81,406    | 193     | 5,097    | 82,158  |
| Canada               | 9,796      | 304,798   | 704     | 15,582   | 306,230                                       |
| Chile                | 6,081      | 252,190   | 169     | 4,775    | 250,230                                       |
| Chinese Taipei       | 2,476      | 190,975   | 162     | 4,295    | 188,886                                       |
| Croatia              | 1,571      | 39,244    | 153     | 4,335    | 39,860  |
| Czech Republic       | 3,578      | 114,774   | 152     | 5,358    | 113,904                                       |
| Denmark              | 1,644      | 66,225    | 166     | 3,693    | 66,950  |
| England              | 15,349     | 644,127   | 139     | 3,872    | 667,451                                       |
| Finland              | 1,840      | 59,755    | 158     | 5,397    | 59,198  |
| France               | 31,716     | 822,438   | 155     | 4,792    | 827,474                                       |
| Georgia              | 1,678      | 42,980    | 154     | 4,316    | 40,185  |
| Germany              | 17,584     | 716,091   | 203     | 3,933    | 725,273                                       |
| Hong Kong SAR        | 564        | 60,786    | 139     | 3,386    | 60,761  |
| Hungary              | 2,888      | 94,673    | 149     | 5,227    | 89,198  |
| Italy                | 6,809      | 556,298   | 162     | 4,269    | 549,275                                       |
| Korea, Rep. of       | 5,478      | 472,130   | 151     | 4,448    | 453,918                                       |
| Lithuania            | 827        | 28,035    | 207     | 4,265    | 28,383  |
| Malta                | 098        | 4,429     | 98      | 4,154    | 4,461   |
| Netherlands          | 6,291      | 178,200   | 112     | 3,831    | 181,849                                       |
| Norway (5)           | 1,945      | 62,012    | 150     | 4,527    | 63,745  |
| Portugal             | 1,245      | 99,927    | 181     | 4,915    | 96,042  |
| Qatar                | 247        | 25,506    | 242     | 5,646    | 24,518  |
| Russian Federation   | 40,575     | 1,414,240 | 200     | 4,596    | 1,602,928                                     |
| Singapore            | 187        | 39,934    | 187     | 6,839    | 40,099  |
| Slovak Republic      | 2,000      | 52,222    | 157     | 4,862    | 51,506  |
| Spain                | 12,861     | 489,765   | 501     | 10,946   | 493,083                                       |
| Sweden               | 3,276      | 114,494   | 145     | 4,535    | 114,323                                       |
| Turkey (5)           | 16,205     | 1,239,900 | 180     | 4,599    | 1,195,922                                     |
| United Arab Emirates | 754        | 85,609    | 688     | 29,515   | 85,132  |
| United States        | 72,902     | 4,153,454 | 287     | 10,029   | 4,056,773                                     |

## Benchmarking Participants

|                           |       |         |     |        |         |
|---------------------------|-------|---------|-----|--------|---------|
| Ontario, Canada           | 3,683 | 147,295 | 163 | 4,360  | 144,324 |
| Quebec, Canada            | 1,764 | 85,132  | 148 | 4,384  | 87,936  |
| Moscow City, Russian Fed. | 695   | 92,630  | 150 | 4,392  | 102,549 |
| Madrid, Spain             | 1,343 | 70,232  | 167 | 3,879  | 72,520  |
| Abu Dhabi, UAE            | 285   | 29,938  | 247 | 10,328 | 29,215  |
| Dubai, UAE                | 184   | 22,567  | 199 | 8,299  | 23,893  |

### Target Population and Sample Sizes – eTIMSS 2019 with Problem Solving and Inquiry—Grade 8

| Country                          | Population |           | Sample  |          |   |
|----------------------------------|------------|-----------|---------|----------|---|
|                                  | Schools    | Students  | Schools | Students | Student Population Size Estimated from Sample |
| Chile                            | 5,767      | 246,120   | 164     | 4,697    | 238,684                                       |
| Chinese Taipei                   | 931        | 214,516   | 203     | 5,610    | 205,439                                       |
| England                          | 3,706      | 584,697   | 136     | 3,858    | 591,308                                       |
| Finland                          | 693        | 57,591    | 154     | 5,570    | 56,237  |
| France                           | 6,977      | 814,850   | 150     | 4,426    | 813,845                                       |
| Georgia                          | 1,837      | 45,339    | 145     | 3,789    | 44,727  |
| Hong Kong SAR                    | 478        | 54,160    | 136     | 3,730    | 55,130  |
| Hungary                          | 2,724      | 87,805    | 154     | 5,219    | 89,223  |
| Israel                           | 979        | 106,971   | 157     | 4,269    | 108,184                                       |
| Italy                            | 5,775      | 566,636   | 158     | 4,138    | 553,839                                       |
| Korea, Rep. of                   | 3,006      | 465,626   | 168     | 4,409    | 444,287                                       |
| Lithuania                        | 706        | 25,394    | 194     | 4,366    | 25,427  |
| Malaysia                         | 2,565      | 423,150   | 177     | 8,077    | 412,165                                       |
| Norway (9)                       | 1,012      | 60,847    | 157     | 5,216    | 62,287  |
| Portugal                         | 1,039      | 108,807   | 156     | 3,867    | 106,814                                       |
| Qatar                            | 156        | 19,513    | 152     | 4,437    | 18,715  |
| Russian Federation               | 37,308     | 1,326,933 | 204     | 4,456    | 1,392,266                                     |
| Singapore                        | 153        | 38,517    | 153     | 5,546    | 38,595  |
| Sweden                           | 1,600      | 108,164   | 150     | 4,565    | 110,810                                       |
| Turkey                           | 16,179     | 1,204,063 | 181     | 4,662    | 1,158,547                                     |
| United Arab Emirates             | 685        | 68,113    | 623     | 25,539   | 68,388  |
| United States                    | 48,557     | 4,059,757 | 273     | 9,944    | 3,800,419                                     |
| <b>Benchmarking Participants</b> |            |           |         |          |   |
| Ontario, Canada                  | 2,896      | 143,484   | 158     | 4,330    | 138,206                                       |
| Quebec, Canada                   | 539        | 80,005    | 124     | 3,638    | 74,939  |
| Moscow City, Russian Fed.        | 704        | 85,856    | 150     | 4,324    | 92,180  |
| Abu Dhabi, UAE                   | 266        | 24,654    | 230     | 9,380    | 23,805  |
| Dubai, UAE                       | 153        | 17,560    | 163     | 6,544    | 18,752  |

## Participation Rates (Weighted) – eTIMSS 2019 with Problem Solving and Inquiry—Grade 4

| Country              | School Participation |                   | Class Participation | Student Participation | Overall Participation |                   |
|----------------------|----------------------|-------------------|---------------------|-----------------------|-----------------------|-------------------|
|                      | Before Replacement   | After Replacement |                     |                       | Before Replacement    | After Replacement |
| Austria              | 99%                  | 99%               | 100%                | 100%                  | 97%                   | 96%               |
| Canada               | 86%                  | 90%               | 100%                | 100%                  | 94%                   | 81%               |
| Chile                | 89%                  | 99%               | 100%                | 100%                  | 95%                   | 85%               |
| Chinese Taipei       | 95%                  | 99%               | 100%                | 100%                  | 98%                   | 94%               |
| Croatia              | 95%                  | 97%               | 99%                 | 99%                   | 90%                   | 84%               |
| Czech Republic       | 99%                  | 100%              | 100%                | 100%                  | 95%                   | 94%               |
| † Denmark            | 70%                  | 95%               | 99%                 | 99%                   | 86%                   | 60%               |
| England              | 86%                  | 93%               | 100%                | 100%                  | 95%                   | 82%               |
| Finland              | 99%                  | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| France               | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Georgia              | 97%                  | 99%               | 100%                | 100%                  | 97%                   | 93%               |
| Germany              | 97%                  | 100%              | 100%                | 100%                  | 96%                   | 94%               |
| † Hong Kong SAR      | 67%                  | 88%               | 100%                | 100%                  | 89%                   | 60%               |
| Hungary              | 93%                  | 99%               | 100%                | 100%                  | 96%                   | 89%               |
| Italy                | 96%                  | 100%              | 100%                | 100%                  | 96%                   | 92%               |
| Korea, Rep. of       | 99%                  | 99%               | 100%                | 100%                  | 98%                   | 97%               |
| Lithuania            | 100%                 | 100%              | 100%                | 100%                  | 93%                   | 93%               |
| Malta                | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| ≡ Netherlands        | 46%                  | 75%               | 100%                | 100%                  | 97%                   | 45%               |
| † Norway (5)         | 70%                  | 90%               | 100%                | 100%                  | 93%                   | 65%               |
| Portugal             | 87%                  | 100%              | 99%                 | 99%                   | 94%                   | 81%               |
| Qatar                | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Russian Federation   | 99%                  | 99%               | 100%                | 100%                  | 98%                   | 97%               |
| Singapore            | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Slovak Republic      | 97%                  | 99%               | 100%                | 100%                  | 96%                   | 93%               |
| Spain                | 97%                  | 99%               | 100%                | 100%                  | 95%                   | 92%               |
| Sweden               | 100%                 | 100%              | 100%                | 100%                  | 94%                   | 94%               |
| Turkey (5)           | 99%                  | 100%              | 100%                | 100%                  | 99%                   | 98%               |
| United Arab Emirates | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 95%               |
| † United States      | 76%                  | 88%               | 100%                | 100%                  | 95%                   | 73%               |

## Benchmarking Participants

|                           |      |      |      |      |     |     |
|---------------------------|------|------|------|------|-----|-----|
| Ontario, Canada           | 93%  | 95%  | 100% | 100% | 94% | 87% |
| Quebec, Canada            | 82%  | 86%  | 100% | 100% | 96% | 79% |
| Moscow City, Russian Fed. | 99%  | 100% | 100% | 100% | 97% | 96% |
| Madrid, Spain             | 100% | 100% | 100% | 100% | 96% | 96% |
| Abu Dhabi, UAE            | 100% | 100% | 100% | 100% | 95% | 95% |
| Dubai, UAE                | 100% | 100% | 100% | 100% | 96% | 96% |

TIMSS guidelines for sampling participation: The minimum acceptable participation rates were 85 percent of both schools and students, or a combined rate (the product of school and student participation) of 75 percent.

Participants not meeting these guidelines were annotated as follows:

- † Met guidelines for sample participation rates only after replacement schools were included
- ‡ Nearly satisfied guidelines for sample participation rates after replacement schools were included
- ≡ Did not satisfy guidelines for sample participation rates

## Participation Rates (Weighted) – eTIMSS 2019 with Problem Solving and Inquiry—Grade 8

| Country              | School Participation |                   | Class Participation | Student Participation | Overall Participation |                   |
|----------------------|----------------------|-------------------|---------------------|-----------------------|-----------------------|-------------------|
|                      | Before Replacement   | After Replacement |                     |                       | Before Replacement    | After Replacement |
| Chile                | 90%                  | 99%               | 100%                | 100%                  | 95%                   | 86%               |
| Chinese Taipei       | 98%                  | 99%               | 100%                | 100%                  | 98%                   | 95%               |
| England              | 83%                  | 90%               | 100%                | 100%                  | 94%                   | 78%               |
| Finland              | 100%                 | 100%              | 100%                | 100%                  | 95%                   | 95%               |
| France               | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| Georgia              | 90%                  | 92%               | 100%                | 100%                  | 97%                   | 87%               |
| † Hong Kong SAR      | 70%                  | 86%               | 100%                | 100%                  | 93%                   | 65%               |
| Hungary              | 95%                  | 99%               | 100%                | 100%                  | 96%                   | 91%               |
| Israel               | 95%                  | 98%               | 100%                | 100%                  | 92%                   | 87%               |
| Italy                | 97%                  | 100%              | 100%                | 100%                  | 97%                   | 93%               |
| Korea, Rep. of       | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Lithuania            | 99%                  | 99%               | 100%                | 100%                  | 92%                   | 92%               |
| Malaysia             | 99%                  | 100%              | 100%                | 100%                  | 98%                   | 97%               |
| † Norway (9)         | 79%                  | 95%               | 99%                 | 99%                   | 88%                   | 68%               |
| Portugal             | 95%                  | 99%               | 99%                 | 99%                   | 95%                   | 89%               |
| Qatar                | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Russian Federation   | 99%                  | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Singapore            | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| Sweden               | 98%                  | 99%               | 100%                | 100%                  | 91%                   | 89%               |
| Turkey               | 100%                 | 100%              | 100%                | 100%                  | 98%                   | 98%               |
| United Arab Emirates | 100%                 | 100%              | 100%                | 100%                  | 95%                   | 95%               |
| † United States      | 72%                  | 85%               | 100%                | 100%                  | 93%                   | 66%               |

## Benchmarking Participants

|                           |      |      |      |      |     |     |
|---------------------------|------|------|------|------|-----|-----|
| Ontario, Canada           | 93%  | 93%  | 100% | 100% | 94% | 87% |
| ‡ Quebec, Canada          | 74%  | 77%  | 99%  | 99%  | 94% | 69% |
| Moscow City, Russian Fed. | 99%  | 100% | 100% | 100% | 97% | 95% |
| Abu Dhabi, UAE            | 100% | 100% | 100% | 100% | 95% | 95% |
| Dubai, UAE                | 100% | 100% | 100% | 100% | 96% | 96% |

TIMSS guidelines for sampling participation: The minimum acceptable participation rates were 85 percent of both schools and students, or a combined rate (the product of school and student participation) of 75 percent.

Participants not meeting these guidelines were annotated as follows:

- † Met guidelines for sample participation rates only after replacement schools were included
- ‡ Nearly satisfied guidelines for sample participation rates after replacement schools were included
- ≡ Did not satisfy guidelines for sample participation rates

## Participation Rates (Unweighted) – eTIMSS 2019 with Problem Solving and Inquiry—Grade 4

| Country              | School Participation |                   | Class Participation | Student Participation | Overall Participation |                   |
|----------------------|----------------------|-------------------|---------------------|-----------------------|-----------------------|-------------------|
|                      | Before Replacement   | After Replacement |                     |                       | Before Replacement    | After Replacement |
| Austria              | 99%                  | 99%               | 100%                | 100%                  | 97%                   | 96%               |
| Canada               | 86%                  | 91%               | 100%                | 100%                  | 94%                   | 81%               |
| Chile                | 88%                  | 98%               | 100%                | 100%                  | 95%                   | 84%               |
| Chinese Taipei       | 95%                  | 99%               | 100%                | 100%                  | 98%                   | 93%               |
| Croatia              | 95%                  | 97%               | 98%                 | 98%                   | 89%                   | 84%               |
| Czech Republic       | 99%                  | 100%              | 100%                | 100%                  | 95%                   | 94%               |
| Denmark              | 71%                  | 95%               | 99%                 | 99%                   | 86%                   | 60%               |
| England              | 86%                  | 93%               | 99%                 | 99%                   | 95%                   | 81%               |
| Finland              | 99%                  | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| France               | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Georgia              | 96%                  | 98%               | 100%                | 100%                  | 97%                   | 93%               |
| Germany              | 98%                  | 100%              | 100%                | 100%                  | 96%                   | 94%               |
| Hong Kong SAR        | 69%                  | 87%               | 100%                | 100%                  | 89%                   | 61%               |
| Hungary              | 93%                  | 99%               | 100%                | 100%                  | 96%                   | 89%               |
| Italy                | 94%                  | 100%              | 100%                | 100%                  | 96%                   | 91%               |
| Korea, Rep. of       | 99%                  | 99%               | 100%                | 100%                  | 98%                   | 97%               |
| Lithuania            | 100%                 | 100%              | 100%                | 100%                  | 93%                   | 93%               |
| Malta                | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| Netherlands          | 48%                  | 75%               | 100%                | 100%                  | 97%                   | 46%               |
| Norway (5)           | 71%                  | 90%               | 100%                | 100%                  | 93%                   | 66%               |
| Portugal             | 87%                  | 100%              | 99%                 | 99%                   | 93%                   | 81%               |
| Qatar                | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Russian Federation   | 99%                  | 99%               | 100%                | 100%                  | 97%                   | 96%               |
| Singapore            | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Slovak Republic      | 97%                  | 99%               | 100%                | 100%                  | 96%                   | 93%               |
| Spain                | 98%                  | 100%              | 100%                | 100%                  | 95%                   | 94%               |
| Sweden               | 99%                  | 100%              | 100%                | 100%                  | 94%                   | 94%               |
| Turkey (5)           | 99%                  | 100%              | 100%                | 100%                  | 98%                   | 98%               |
| United Arab Emirates | 100%                 | 100%              | 100%                | 100%                  | 95%                   | 95%               |
| United States        | 77%                  | 88%               | 100%                | 100%                  | 95%                   | 73%               |

## Benchmarking Participants

|                           |      |      |      |      |     |     |
|---------------------------|------|------|------|------|-----|-----|
| Ontario, Canada           | 94%  | 96%  | 100% | 100% | 94% | 88% |
| Quebec, Canada            | 81%  | 86%  | 100% | 100% | 96% | 78% |
| Moscow City, Russian Fed. | 98%  | 99%  | 100% | 100% | 97% | 95% |
| Madrid, Spain             | 100% | 100% | 100% | 100% | 96% | 96% |
| Abu Dhabi, UAE            | 100% | 100% | 100% | 100% | 95% | 95% |
| Dubai, UAE                | 100% | 100% | 100% | 100% | 96% | 96% |

## Participation Rates (Unweighted) – eTIMSS 2019 with Problem Solving and Inquiry—Grade 8

| Country                          | School Participation |                   | Class Participation | Student Participation | Overall Participation |                   |
|----------------------------------|----------------------|-------------------|---------------------|-----------------------|-----------------------|-------------------|
|                                  | Before Replacement   | After Replacement |                     |                       | Before Replacement    | After Replacement |
| Chile                            | 88%                  | 98%               | 100%                | 100%                  | 95%                   | 84%               |
| Chinese Taipei                   | 98%                  | 99%               | 100%                | 100%                  | 98%                   | 95%               |
| England                          | 83%                  | 90%               | 100%                | 100%                  | 94%                   | 78%               |
| Finland                          | 100%                 | 100%              | 100%                | 100%                  | 95%                   | 95%               |
| France                           | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| Georgia                          | 90%                  | 92%               | 100%                | 100%                  | 97%                   | 87%               |
| Hong Kong SAR                    | 71%                  | 86%               | 100%                | 100%                  | 93%                   | 66%               |
| Hungary                          | 94%                  | 99%               | 100%                | 100%                  | 96%                   | 91%               |
| Israel                           | 94%                  | 98%               | 100%                | 100%                  | 92%                   | 87%               |
| Italy                            | 97%                  | 100%              | 100%                | 100%                  | 97%                   | 94%               |
| Korea, Rep. of                   | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Lithuania                        | 99%                  | 99%               | 100%                | 100%                  | 92%                   | 92%               |
| Malaysia                         | 99%                  | 100%              | 100%                | 100%                  | 98%                   | 97%               |
| Norway (9)                       | 80%                  | 95%               | 98%                 | 98%                   | 89%                   | 70%               |
| Portugal                         | 94%                  | 99%               | 99%                 | 99%                   | 95%                   | 88%               |
| Qatar                            | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Russian Federation               | 100%                 | 100%              | 100%                | 100%                  | 97%                   | 97%               |
| Singapore                        | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 96%               |
| Sweden                           | 99%                  | 99%               | 100%                | 100%                  | 91%                   | 89%               |
| Turkey                           | 99%                  | 100%              | 100%                | 100%                  | 98%                   | 98%               |
| United Arab Emirates             | 100%                 | 100%              | 100%                | 100%                  | 95%                   | 95%               |
| United States                    | 72%                  | 85%               | 100%                | 100%                  | 93%                   | 67%               |
| <b>Benchmarking Participants</b> |                      |                   |                     |                       |                       |                   |
| Ontario, Canada                  | 92%                  | 93%               | 100%                | 100%                  | 93%                   | 86%               |
| Quebec, Canada                   | 74%                  | 77%               | 99%                 | 99%                   | 94%                   | 69%               |
| Moscow City, Russian Fed.        | 97%                  | 99%               | 100%                | 100%                  | 97%                   | 94%               |
| Abu Dhabi, UAE                   | 100%                 | 100%              | 100%                | 100%                  | 95%                   | 95%               |
| Dubai, UAE                       | 100%                 | 100%              | 100%                | 100%                  | 96%                   | 96%               |



## School Sample Sizes – eTIMSS 2019 with Problem Solving and Inquiry—Grade 4

| Country              | Number of Schools in Original Sample | Number of Eligible Schools | Number of Schools in Original Sample that Participated | Number of Replacement Schools that Participated | Total Number of Schools that Participated |
|----------------------|--------------------------------------|----------------------------|--|---|---|
| Austria              | 197                                  | 194                        | 193  | 0   | 193                                       |
| Canada               | 788                                  | 777                        | 669  | 35  | 704                                       |
| Chile                | 174                                  | 172                        | 151  | 18  | 169                                       |
| Chinese Taipei       | 163                                  | 163                        | 155  | 7   | 162                                       |
| Croatia              | 159                                  | 158                        | 150  | 3   | 153                                       |
| Czech Republic       | 156                                  | 152                        | 151  | 1   | 152                                       |
| Denmark              | 175                                  | 174                        | 123  | 43  | 166                                       |
| England              | 150                                  | 150                        | 129  | 10  | 139                                       |
| Finland              | 159                                  | 158                        | 157  | 1   | 158                                       |
| France               | 156                                  | 155                        | 155  | 0   | 155                                       |
| Georgia              | 158                                  | 157                        | 151  | 3   | 154                                       |
| Germany              | 206                                  | 203                        | 198  | 5   | 203                                       |
| Hong Kong SAR        | 159                                  | 159                        | 109  | 30  | 139                                       |
| Hungary              | 151                                  | 150                        | 139  | 10  | 149                                       |
| Italy                | 162                                  | 162                        | 153  | 9   | 162                                       |
| Korea, Rep. of       | 152                                  | 152                        | 151  | 0   | 151                                       |
| Lithuania            | 208                                  | 207                        | 207  | 0   | 207                                       |
| Malta                | 99                                   | 98                         | 98   | 0   | 98  |
| Netherlands          | 151                                  | 149                        | 71   | 41  | 112                                       |
| Norway (5)           | 167                                  | 167                        | 119  | 31  | 150                                       |
| Portugal             | 182                                  | 181                        | 158  | 23  | 181                                       |
| Qatar                | 242                                  | 242                        | 242  | 0   | 242                                       |
| Russian Federation   | 202                                  | 202                        | 200  | 0   | 200                                       |
| Singapore            | 187                                  | 187                        | 187  | 0   | 187                                       |
| Slovak Republic      | 159                                  | 158                        | 153  | 4   | 157                                       |
| Spain                | 502                                  | 502                        | 494  | 7   | 501                                       |
| Sweden               | 150                                  | 145                        | 144  | 1   | 145                                       |
| Turkey (5)           | 181                                  | 180                        | 179  | 1   | 180                                       |
| United Arab Emirates | 697                                  | 688                        | 688  | 0   | 688                                       |
| United States        | 329                                  | 325                        | 249  | 38  | 287                                       |

## Benchmarking Participants

|                           |     |     |     |   |     |
|---------------------------|-----|-----|-----|---|-----|
| Ontario, Canada           | 171 | 170 | 160 | 3 | 163 |
| Quebec, Canada            | 172 | 172 | 140 | 8 | 148 |
| Moscow City, Russian Fed. | 152 | 151 | 148 | 2 | 150 |
| Madrid, Spain             | 167 | 167 | 167 | 0 | 167 |
| Abu Dhabi, UAE            | 249 | 247 | 247 | 0 | 247 |
| Dubai, UAE                | 205 | 199 | 199 | 0 | 199 |

### School Sample Sizes – eTIMSS 2019 with Problem Solving and Inquiry—Grade 8

| Country                          | Number of Schools in Original Sample | Number of Eligible Schools | Number of Schools in Original Sample that Participated | Number of Replacement Schools that Participated | Total Number of Schools that Participated |
|----------------------------------|--------------------------------------|----------------------------|--|---|---|
| Chile                            | 169                                  | 167                        | 147  | 17  | 164                                       |
| Chinese Taipei                   | 206                                  | 205                        | 200  | 3   | 203                                       |
| England                          | 151                                  | 151                        | 125  | 11  | 136                                       |
| Finland                          | 158                                  | 154                        | 154  | 0   | 154                                       |
| France                           | 150                                  | 150                        | 150  | 0   | 150                                       |
| Georgia                          | 158                                  | 157                        | 142  | 3   | 145                                       |
| Hong Kong SAR                    | 158                                  | 158                        | 112  | 24  | 136                                       |
| Hungary                          | 155                                  | 155                        | 146  | 8   | 154                                       |
| Israel                           | 161                                  | 161                        | 152  | 5   | 157                                       |
| Italy                            | 158                                  | 158                        | 153  | 5   | 158                                       |
| Korea, Rep. of                   | 168                                  | 168                        | 168  | 0   | 168                                       |
| Lithuania                        | 195                                  | 195                        | 194  | 0   | 194                                       |
| Malaysia                         | 178                                  | 177                        | 175  | 2   | 177                                       |
| Norway (9)                       | 166                                  | 165                        | 132  | 25  | 157                                       |
| Portugal                         | 158                                  | 158                        | 149  | 7   | 156                                       |
| Qatar                            | 152                                  | 152                        | 152  | 0   | 152                                       |
| Russian Federation               | 204                                  | 204                        | 203  | 1   | 204                                       |
| Singapore                        | 153                                  | 153                        | 153  | 0   | 153                                       |
| Sweden                           | 153                                  | 151                        | 149  | 1   | 150                                       |
| Turkey                           | 181                                  | 181                        | 180  | 1   | 181                                       |
| United Arab Emirates             | 631                                  | 623                        | 623  | 0   | 623                                       |
| United States                    | 325                                  | 321                        | 231  | 42  | 273                                       |
| <b>Benchmarking Participants</b> |                                      |                            |  |   |   |
| Ontario, Canada                  | 172                                  | 170                        | 157  | 1   | 158                                       |
| Quebec, Canada                   | 166                                  | 161                        | 119  | 5   | 124                                       |
| Moscow City, Russian Fed.        | 152                                  | 151                        | 147  | 3   | 150                                       |
| Abu Dhabi, UAE                   | 230                                  | 230                        | 230  | 0   | 230                                       |
| Dubai, UAE                       | 171                                  | 163                        | 163  | 0   | 163                                       |

## Student Sample Sizes – eTIMSS 2019 with Problem Solving and Inquiry—Grade 4

| Country                          | Within-School Student Participation (Weighted Percentage) | Number of Students Sampled in Participating Schools | Number of Students Withdrawn from Class/School | Number of Students Excluded | Number of Eligible Students | Number of Students Absent | Number of Students Assessed |
|----------------------------------|---|---|--|-----------------------------|-----------------------------|---------------------------|-----------------------------|
| Austria                          | 97%   | 5,551   | 33   | 256                         | 5,262                       | 165                       | 5,097                       |
| Canada                           | 94%   | 17,231  | 199  | 429                         | 16,603                      | 1021                      | 15,582                      |
| Chile                            | 95%   | 5,209   | 77   | 112                         | 5,020                       | 245                       | 4,775                       |
| Chinese Taipei                   | 98%   | 4,500   | 65   | 65                          | 4,370                       | 75                        | 4,295                       |
| Croatia                          | 90%   | 5,003   | 8  | 148                         | 4,847                       | 512                       | 4,335                       |
| Czech Republic                   | 95%   | 5,767   | 48   | 53                          | 5,666                       | 308                       | 5,358                       |
| Denmark                          | 86%   | 4,414   | 67   | 48                          | 4,299                       | 606                       | 3,693                       |
| England                          | 95%   | 4,268   | 78   | 127                         | 4,063                       | 191                       | 3,872                       |
| Finland                          | 96%   | 5,685   | 37   | 45                          | 5,603                       | 206                       | 5,397                       |
| France                           | 97%   | 5,079   | 35   | 104                         | 4,940                       | 148                       | 4,792                       |
| Georgia                          | 97%   | 4,575   | 28   | 83                          | 4,464                       | 148                       | 4,316                       |
| Germany                          | 96%   | 4,220   | 51   | 89                          | 4,080                       | 147                       | 3,933                       |
| Hong Kong SAR                    | 89%   | 3,932   | 18   | 101                         | 3,813                       | 427                       | 3,386                       |
| Hungary                          | 96%   | 5,551   | 34   | 89                          | 5,428                       | 201                       | 5,227                       |
| Italy                            | 96%   | 4,664   | 22   | 199                         | 4,443                       | 174                       | 4,269                       |
| Korea, Rep. of                   | 98%   | 4,674   | 50   | 63                          | 4,561                       | 113                       | 4,448                       |
| Lithuania                        | 93%   | 4,763   | 12   | 186                         | 4,565                       | 300                       | 4,265                       |
| Malta                            | 96%   | 4,453   | 17   | 115                         | 4,321                       | 167                       | 4,154                       |
| Netherlands                      | 97%   | 4,056   | 69   | 27                          | 3,960                       | 129                       | 3,831                       |
| Norway (5)                       | 93%   | 5,029   | 27   | 149                         | 4,853                       | 326                       | 4,527                       |
| Portugal                         | 94%   | 5,673   | 35   | 366                         | 5,272                       | 357                       | 4,915                       |
| Qatar                            | 97%   | 5,980   | 127  | 60                          | 5,793                       | 147                       | 5,646                       |
| Russian Federation               | 98%   | 4,871   | 8  | 144                         | 4,719                       | 123                       | 4,596                       |
| Singapore                        | 97%   | 7,090   | 22   | 0                           | 7,068                       | 229                       | 6,839                       |
| Slovak Republic                  | 96%   | 5,111   | 26   | 24                          | 5,061                       | 199                       | 4,862                       |
| Spain                            | 95%   | 11,946  | 48   | 421                         | 11,477                      | 531                       | 10,946                      |
| Sweden                           | 94%   | 5,007   | 31   | 160                         | 4,816                       | 281                       | 4,535                       |
| Turkey (5)                       | 99%   | 5,134   | 142  | 319                         | 4,673                       | 74                        | 4,599                       |
| United Arab Emirates             | 96%   | 31,887  | 414  | 564                         | 30,909                      | 1394                      | 29,515                      |
| United States                    | 95%   | 11,271  | 152  | 601                         | 10,518                      | 489                       | 10,029                      |
| <b>Benchmarking Participants</b> |   |   |  |                             |                             |                           |                             |
| Ontario, Canada                  | 94%   | 4,825   | 83   | 95                          | 4,647                       | 287                       | 4,360                       |
| Quebec, Canada                   | 96%   | 4,618   | 9  | 37                          | 4,572                       | 188                       | 4,384                       |
| Moscow City, Russian Fed.        | 97%   | 4,558   | 11   | 35                          | 4,512                       | 120                       | 4,392                       |
| Madrid, Spain                    | 96%   | 4,177   | 17   | 123                         | 4,037                       | 158                       | 3,879                       |
| Abu Dhabi, UAE                   | 95%   | 11,189  | 38   | 239                         | 10,912                      | 584                       | 10,328                      |
| Dubai, UAE                       | 96%   | 9,205   | 362  | 213                         | 8,630                       | 331                       | 8,299                       |

## Student Sample Sizes – eTIMSS 2019 with Problem Solving and Inquiry—Grade 8

| Country                          | Within-School Student Participation (Weighted Percentage) | Number of Students Sampled in Participating Schools | Number of Students Withdrawn from Class/School | Number of Students Excluded | Number of Eligible Students | Number of Students Absent | Number of Students Assessed |
|----------------------------------|---|---|--|-----------------------------|-----------------------------|---------------------------|-----------------------------|
| Chile                            | 95%   | 5,085   | 68   | 76                          | 4,941                       | 244                       | 4,697                       |
| Chinese Taipei                   | 98%   | 5,901   | 106  | 42                          | 5,753                       | 143                       | 5,610                       |
| England                          | 94%   | 4,310   | 140  | 70                          | 4,100                       | 242                       | 3,858                       |
| Finland                          | 95%   | 5,979   | 62   | 62                          | 5,855                       | 285                       | 5,570                       |
| France                           | 96%   | 4,700   | 53   | 49                          | 4,598                       | 172                       | 4,426                       |
| Georgia                          | 97%   | 4,031   | 37   | 73                          | 3,921                       | 132                       | 3,789                       |
| Hong Kong SAR                    | 93%   | 4,115   | 12   | 73                          | 4,030                       | 300                       | 3,730                       |
| Hungary                          | 96%   | 5,540   | 23   | 86                          | 5,431                       | 212                       | 5,219                       |
| Israel                           | 92%   | 4,737   | 36   | 51                          | 4,650                       | 381                       | 4,269                       |
| Italy                            | 97%   | 4,456   | 22   | 153                         | 4,281                       | 143                       | 4,138                       |
| Korea, Rep. of                   | 97%   | 4,593   | 18   | 37                          | 4,538                       | 129                       | 4,409                       |
| Lithuania                        | 92%   | 4,843   | 19   | 98                          | 4,726                       | 360                       | 4,366                       |
| Malaysia                         | 98%   | 8,354   | 120  | 0                           | 8,234                       | 157                       | 8,077                       |
| Norway (9)                       | 88%   | 6,069   | 41   | 141                         | 5,887                       | 671                       | 5,216                       |
| Portugal                         | 95%   | 4,268   | 32   | 152                         | 4,084                       | 217                       | 3,867                       |
| Qatar                            | 97%   | 4,767   | 138  | 32                          | 4,597                       | 160                       | 4,437                       |
| Russian Federation               | 97%   | 4,692   | 28   | 76                          | 4,588                       | 132                       | 4,456                       |
| Singapore                        | 96%   | 5,797   | 19   | 0                           | 5,778                       | 232                       | 5,546                       |
| Sweden                           | 91%   | 5,313   | 64   | 213                         | 5,036                       | 471                       | 4,565                       |
| Turkey                           | 98%   | 4,971   | 111  | 123                         | 4,737                       | 75                        | 4,662                       |
| United Arab Emirates             | 95%   | 27,322  | 251  | 315                         | 26,756                      | 1217                      | 25,539                      |
| United States                    | 93%   | 11,270  | 307  | 242                         | 10,721                      | 777                       | 9,944                       |
| <b>Benchmarking Participants</b> |   |   |  |                             |                             |                           |                             |
| Ontario, Canada                  | 94%   | 4,779   | 63   | 75                          | 4,641                       | 311                       | 4,330                       |
| Quebec, Canada                   | 94%   | 3,895   | 28   | 7                           | 3,860                       | 222                       | 3,638                       |
| Moscow City, Russian Fed.        | 97%   | 4,517   | 21   | 19                          | 4,477                       | 153                       | 4,324                       |
| Abu Dhabi, UAE                   | 95%   | 9,997   | 41   | 86                          | 9,870                       | 490                       | 9,380                       |
| Dubai, UAE                       | 96%   | 7,164   | 199  | 141                         | 6,824                       | 280                       | 6,544                       |