


Exhibit 2.11: Description of the TIMSS 2019 Intermediate International Benchmark (475) of Science Achievement **Intermediate** International Benchmark**475** **Summary**

Students show knowledge and understanding of some aspects of science. Students demonstrate some basic knowledge of plants and animals. They demonstrate knowledge about some properties of matter and some facts related to electricity, and can apply elementary knowledge of forces and motion. They show some understanding of Earth's physical characteristics.

Students show basic knowledge of what plants and animals need to survive as well as some knowledge of the characteristics of animals.

Students can recognize different properties of matter, demonstrate understanding of simple electrical circuits, and apply elementary knowledge of forces and motion, such as the force between a magnet and different materials.

Students show some understanding of Earth's physical characteristics.

Students can relate information in diagrams to some basic science concepts.

Exhibit 2.11.1: Intermediate International Benchmark of Science Achievement – Example Item 1

Content Domain: Life Science

Cognitive Domain: Knowing

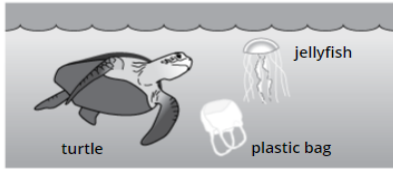
Description: States one reason why plastic objects in the ocean are dangerous for sea animals

Country	Percent Full Credit	
Sweden	86 (1.8)	▲
Finland	85 (1.4)	▲
† Norway (5)	85 (1.9)	▲
Australia	84 (1.6)	▲
Japan	83 (1.6)	▲
≡ Netherlands	83 (1.8)	▲
³ Singapore	83 (1.2)	▲
Cyprus	83 (1.7)	▲
² England	81 (2.1)	▲
Ireland	81 (1.9)	▲
^{2†} United States	79 (1.2)	▲
† Denmark	78 (2.2)	▲
† Belgium (Flemish)	78 (2.1)	▲
† Northern Ireland	76 (2.5)	▲
Malta	76 (1.8)	▲
Chinese Taipei	75 (2.2)	▲
^{1 2} Canada	75 (1.6)	▲
² Russian Federation	74 (2.3)	▲
Czech Republic	73 (1.9)	▲
Germany	73 (2.1)	▲
Korea, Rep. of	73 (2.1)	▲
² Lithuania	71 (1.9)	▲
Spain	70 (2.0)	▲
² New Zealand	70 (1.7)	▲
² Portugal	70 (2.2)	▲
Austria	70 (2.2)	▲
Hungary	68 (2.0)	▲
Poland	67 (1.9)	▲
Italy	65 (2.1)	▲
² Slovak Republic	63 (2.4)	▲
France	62 (2.6)	▲
† Hong Kong SAR	62 (3.0)	▲
Chile	61 (2.1)	▲
² Latvia	60 (2.2)	▲
² Turkey (5)	58 (2.4)	▲
International Average	57 (0.3)	
² Serbia	54 (2.7)	
Croatia	51 (2.3)	▼
Bahrain	48 (2.2)	▼
Armenia	45 (2.4)	▼
Qatar	45 (2.6)	▼
United Arab Emirates	44 (1.0)	▼
Bulgaria	42 (3.1)	▼
Albania	40 (2.9)	▼
Bosnia and Herzegovina	39 (2.5)	▼
¹ Georgia	36 (2.8)	▼
Montenegro	35 (2.1)	▼
Oman	34 (2.1)	▼
² Kazakhstan	33 (2.0)	▼
South Africa (5)	28 (1.5)	▼
Kuwait	28 (2.0)	▼
Iran, Islamic Rep. of	21 (1.8)	▼
Morocco	21 (1.9)	▼
Azerbaijan	20 (1.9)	▼
North Macedonia	19 (2.3)	▼
² Kosovo	17 (1.9)	▼
² Saudi Arabia	14 (1.4)	▼
² Philippines	11 (1.5)	▼
² Pakistan	7 (1.9)	▼
Benchmarking Participants		
Moscow City, Russian Fed.	78 (2.0)	▲
Madrid, Spain	76 (2.6)	▲
² Ontario, Canada	76 (2.7)	▲
Quebec, Canada	73 (2.4)	▲
² Dubai, UAE	60 (2.1)	▼
Abu Dhabi, UAE	34 (1.4)	▼

- ▲ Percent significantly higher than international average
- ▼ Percent significantly lower than international average

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡. () Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

The picture shows a turtle and jellyfish swimming in the ocean. A plastic bag is floating nearby.



Write down one reason why plastic objects in the ocean are dangerous for animals such as turtles.

The turtle's flippers could get tangled up in the bag and make it hard for it to swim.

The answer shown illustrates the type of response that would receive full credit (1 point).

Exhibit 2.11.2: Intermediate International Benchmark of Science Achievement – Example Item 2

Content Domain: Physical Science

Cognitive Domain: Applying

Description: Recognizes the best explanation for why a box on a cart is easier to pull than a box resting directly on the floor

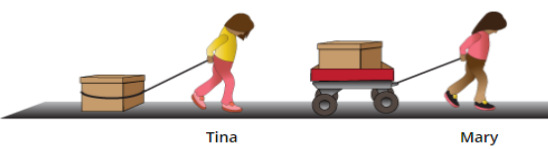
Country	Percent Correct
Finland	88 (1.4) ▲
Korea, Rep. of	87 (1.6) ▲
³ Singapore	85 (1.2) ▲
Chinese Taipei	85 (1.5) ▲
† Hong Kong SAR	83 (2.1) ▲
² Russian Federation	82 (2.1) ▲
² Lithuania	82 (1.9) ▲
Sweden	81 (1.7) ▲
Ireland	80 (1.9) ▲
² Latvia	80 (2.0) ▲
² England	77 (2.1) ▲
† Northern Ireland	76 (2.0) ▲
² Serbia	76 (2.3) ▲
Australia	76 (2.1) ▲
Hungary	75 (1.9) ▲
† Belgium (Flemish)	74 (2.2) ▲
† Denmark	73 (2.0) ▲
Poland	72 (1.8) ▲
Italy	72 (2.6) ▲
Germany	72 (2.2) ▲
² New Zealand	72 (2.0) ▲
^{1,2} Canada	72 (2.1) ▲
^{2†} United States	71 (1.4) ▲
† Norway (5)	71 (2.2) ▲
² Slovak Republic	70 (2.1) ▲
Croatia	70 (2.8)
[≡] Netherlands	70 (2.4)
Czech Republic	69 (2.2)
² Kazakhstan	68 (1.9)
Cyprus	68 (1.8)
Austria	67 (2.2)
Spain	67 (2.1)
International Average	66 (0.3)
Malta	66 (2.2)
Japan	66 (2.2)
Bulgaria	65 (2.8)
Albania	64 (2.3)
Bahrain	63 (1.8)
² Portugal	62 (1.9) ▼
Iran, Islamic Rep. of	61 (2.3) ▼
United Arab Emirates	61 (0.8) ▼
² Turkey (5)	60 (2.6) ▼
Azerbaijan	60 (2.2) ▼
Bosnia and Herzegovina	58 (2.1) ▼
France	58 (2.1) ▼
¹ Georgia	55 (2.7) ▼
Qatar	54 (2.2) ▼
² Kosovo	54 (2.2) ▼
Montenegro	53 (2.1) ▼
Oman	53 (1.8) ▼
North Macedonia	51 (3.0) ▼
Chile	50 (2.1) ▼
² Saudi Arabia	49 (2.3) ▼
Armenia	48 (2.4) ▼
South Africa (5)	47 (1.5) ▼
Kuwait	45 (2.1) ▼
Morocco	41 (2.0) ▼
² Pakistan	39 (4.7) ▼
² Philippines	36 (2.0) ▼
Benchmarking Participants	
Moscow City, Russian Fed.	88 (1.7) ▲
² Dubai, UAE	77 (1.6) ▲
Madrid, Spain	73 (2.6) ▲
² Ontario, Canada	72 (3.7)
Quebec, Canada	68 (2.4)
Abu Dhabi, UAE	52 (1.4) ▼

▲ Percent significantly higher than international average

▼ Percent significantly lower than international average

See Appendix B.2 for population coverage notes 1, 2, and 3. See Appendix B.5 for sampling guidelines and sampling participation notes †, ‡, and ≡. () Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Tina and Mary need to move identical heavy boxes. Tina has to pull harder on her box to move it than Mary does.



Why is it easier for Mary to move her box?

- A** Gravity acting on Tina's box is much stronger.
- B** Air resistance acting on Tina's box is much greater.
- C** The cart increases the magnetic force acting on Mary's box.
- D** The cart's wheels decrease the force needed to move Mary's box.