### Intermediate International Benchmark

<table>
<thead>
<tr>
<th><strong>475</strong></th>
<th><strong>Summary</strong></th>
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<tbody>
<tr>
<td><strong>Students show and apply some knowledge of biology and the physical sciences.</strong> Students demonstrate some knowledge of characteristics of animals and apply knowledge of ecosystems. They show some knowledge of the properties of matter, chemical changes, and a few physics concepts.</td>
<td></td>
</tr>
</tbody>
</table>

| Students demonstrate limited knowledge of characteristics of animals and of animals’ adaptations to their environment. They can apply knowledge of ecosystems and the interaction of living things with their environment. |

| Students show some knowledge of the structure and properties of matter and chemical changes. |

| Students can separate conductors from insulators based on differences in electric current, recognize energy change in an everyday object moving downhill, and recognize that the gravity on Earth is different than on another planet. |

| Students can interpret information from graphs and pictorial diagrams. |

**SOURCE:** IEA’s Trends in International Mathematics and Science Study - TIMSS 2019

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### Exhibit 4.11.1: Intermediate International Benchmark of Science Achievement – Example Item 1

**Content Domain:** Biology  
**Cognitive Domain:** Reasoning  
**Description:** Reasons how a crocodile’s angle of vision helps it to survive in the environment

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<tr>
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<td>84 (1.5) ▲</td>
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<td>Portugal</td>
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</tr>
<tr>
<td>Ireland</td>
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<td>Korea, Rep. of</td>
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**International Average**  
55 (0.3)

**Benchmarking Participants**

- Moscow City, Russian Fed.  
- Ontario, Canada  
- Quebec, Canada  
- Dubai, UAE  
- Western Cape, RSA (9)  
- Abu Dhabi, UAE  
- Gauteng, RSA (9)

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

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**Crocodile Facts**
1. Crocodiles have a lifespan of up to 75 years.
2. Crocodiles today look like ancient crocodiles found in fossils.
3. Crocodiles have an angle of vision of 290° as shown in the diagram.

Dixon read a fact sheet about crocodiles.

**How can a crocodile’s angle of vision help it to survive in its environment?**

The crocodile can see predators and prey almost all of the way around its body without moving its head.

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

See Appendix B.7 for target population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

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### Exhibit 4.11.2: Intermediate International Benchmark of Science Achievement – Example Item 2

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

See Appendix B.7 for target population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and §.

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</tr>
<tr>
<td>Lebanon</td>
<td>39 (2.6)</td>
</tr>
</tbody>
</table>

**Benchmarking Participants**

- Quebec, Canada: 85 (2.1)
- Moscow City, Russian Fed.: 84 (2.0)
- Ontario, Canada: 84 (1.8)
- Dubai, UAE: 81 (1.7)
- Western Cape, RSA (9): 69 (1.6)
- Gauteng, RSA (9): 68 (1.5)
- Abu Dhabi, UAE: 53 (1.8)

**Content Domain:** Physics  
**Cognitive Domain:** Knowing

**Description:** Recognizes why a vehicle has a different weight on Mars than it does on Earth

---

The vehicle has a different weight on Mars than it has on the Earth. Why does the vehicle have different weights on the two planets?

- **A.** The vehicle lost mass when it was transported from Earth to Mars.
- **B.** The vehicle gained mass when it began moving on Mars.
- **C.** The magnetic attraction on Earth is different from Mars.
- **D.** The gravitational attraction on Earth is different from Mars.

---

**Percent significantly higher than international average**  
**Percent significantly lower than international average**

---

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