





Exhibit 4.7: Summary of TIMSS 2019 International Benchmarks of Science Achievement

 Advanced International Benchmark	
625	<p><i>Students communicate understanding of concepts related to biology, chemistry, physics, and Earth science in a variety of contexts. Students can classify animals into taxonomic groups. They can apply knowledge of cell structures and their functions. Students show some understanding of diversity, adaptation, and natural selection. They also recognize the interdependence of populations of organisms in an ecosystem. Students demonstrate knowledge of the composition of matter and the periodic table of the elements. Students use physical properties of matter to sort, classify, and compare substances and materials. They also recognize evidence that a chemical reaction has occurred. Students communicate understanding of particle spacing and motion in different physical states. Students apply knowledge of energy transfer and electrical circuits, can relate the properties of light and sound to common phenomena, and demonstrate understanding of forces in everyday contexts. Students communicate understanding of Earth's structure, physical features, and processes. They demonstrate knowledge of the Earth's resources and their conservation.</i></p>
 High International Benchmark	
550	<p><i>Students apply understanding of concepts from biology, chemistry, physics, and Earth science. Students can apply knowledge of the characteristics of groups of animals, life processes in humans, cells and their functions, genetic inheritance, ecosystems, and nutrition. Students show some knowledge and understanding of the composition and properties of matter and chemical reactions. They can apply basic knowledge of energy transformation and transfer, electrical circuits, properties of magnets, light, sound, and forces. They can apply knowledge of Earth's physical features, processes, cycles, and history, and show some understanding of Earth's resources and their use.</i></p>
 Intermediate International Benchmark	
475	<p><i>Students show and apply some knowledge of biology and the physical sciences. 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.</i></p>
 Low International Benchmark	
400	<p><i>Students show limited understanding of scientific principles and concepts and limited knowledge of science facts.</i></p>