

Exhibit 14. Common U.S. and international topics for Population 2 science. The U.S. composite science curriculum in state curriculum guides includes fewer topics than does the international composite at this grade level. We see this by looking only at the common topics in state curriculum guides and not those in textbooks. While state curriculum guides commonly plan for about 30 science topics, they are not the same science topics in each state. The list of specific common topics is thus smaller. The state science curricula are still unfocused since each state still plans for a comparatively large number of topics. [This exhibit lists topics from the TIMSS' science framework intended by at least 70 percent of the countries (international) or at least 70 percent of sampled state guides (U.S.) for the upper grade of Population 2 (U.S. grade 8). Bold-face labels are more general categories that subsume more specific (non-bold-face) topics. Both lists (U.S. and international) are arranged in 70 percent of both curriculum guides and textbooks, and topics listed only in 70 percent of the textbooks. Asterisks mark topics receiving more extensive textbook attention.]

International	U.S.
CURRICULUM GUIDES (Not In Textbooks)	
<p>Life Sciences Diversity, Organization, Structure of Living Things Other Organisms (Types of Microorganisms) Cells Life Spirals, Genetic Continuity, Diversity Evolution, Speciation, Diversity Interactions of Living Things Biomes & Ecosystems Habitats & Niches Animal Behavior Human Biology & Health</p> <p>Physical Sciences Structure of Matter Subatomic Particles Energy and Physical Processes Magnetism</p> <p>Environmental and Resource Issues World Population Food Production, Storage Effects of Natural Disasters</p> <p>Nature of Science Nature of Scientific Knowledge</p>	
CURRICULUM GUIDES (Included in Textbooks)	
<p>Earth Sciences Earth Features Rocks, Soil Earth Processes Weather & Climate</p> <p>Life Sciences Diversity, Organization, Structure of Living Things Plants, Fungi Animals Organs, Tissues* Life Processes and Systems Enabling Life Functions Energy Handling Sensing & Responding Life Spirals, Genetic Continuity, Diversity Life Cycles Reproduction Interactions of Living Things Interdependence of Life Human Biology and Health Disease</p> <p>Physical Sciences Matter Classification of Matter Physical Properties Chemical Properties Structure of Matter Atoms, Ions, Molecules Energy and Physical Processes Energy Types, Sources, Conversions Heat & Temperature Light Electricity Chemical Transformations Explanations of Chemical Changes Forces and Motion</p>	<p>Life Sciences Diversity, Organization, Structure of Living Things Plants, Fungi Organs, Tissues</p> <p>Interactions of Living Things Interdependence of Life</p> <p>Physical Sciences Matter Physical Properties Chemical Properties</p> <p>Energy and Physical Processes Energy Types, Sources, Conversions</p> <p>Electricity</p> <p>Forces and Motion</p>

<p>Types of Forces</p> <p>Science, Technology, and Mathematics Interactions of Science, Mathematics and Technology Science Applications in Math, Technology Interactions of Science, Technology and Society Influence of Science, Technology on Society</p> <p>Environmental and Resource Issues Pollution Conservation of Land, Water, & Sea Resources Conservation of Material & Energy Resources</p>	<p>Time, Space, and Motion</p> <p>Environmental and Resource Issues Pollution</p> <p>Nature of Science Nature of Scientific Knowledge</p>
EXCLUSIVELY IN TEXTBOOKS	
<p>Earth Sciences Earth Features</p> <p>Rocks, Soil</p> <p>Physical Sciences</p> <p>Physical Transformations Physical Changes</p> <p>Forces and Motion Time, Space, & Motion</p> <p>History of Science & Technology</p>	<p>Earth Sciences Earth Features Landforms Bodies of Water Atmosphere Rocks, Soil Ice Forms Earth Processes Weather & Climate Physical Cycles Earth's History Earth in the Universe Earth in the Solar System Planets in the Solar System</p> <p>Life Sciences Diversity, Organization, Structure of Living Things Animals Other Organisms Cells Life Processes and Systems Enabling Life Functions Energy Handling Sensing & Responding Life Spirals, Genetic Continuity, Diversity Life Cycles Reproduction Evolution, Speciation, Diversity Interaction of Living Things Biomes & Ecosystems Human Biology and Health Nutrition Disease</p> <p>Physical Sciences Matter Classification of Matter Structure of Matter Atoms, Ions, Molecules Subatomic Particles Energy and Physical Processes Heat & Temperature Sound & Vibration Physical Transformations Physical Changes Chemical Transformations Chemical Changes Nuclear Chemistry Forces and Motion Types of Forces</p> <p>Science, Technology, and Mathematics Nature or Conceptions of Technology Interactions of Science, Mathematics and Technology Applications of Science in Math, Technology Interactions of Science, Technology, and Society Influence of Science, Technology on Society</p> <p>History of Science & Technology</p> <p>Environmental and Resources Issues Conservation of Land, Water, & Sea Resources Conservation of Material & Energy Resource Food Production, Storage Effect of Natural Disasters</p> <p>Nature of Science The Scientific Enterprise Science and Other Disciplines Scientific and Mathematics</p>

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