

Middle School Science	Boardworks Middle School Presentations
GRADE 6	
Earth and Space Sciences	
1. Describe the rock cycle and explain that there are sedimentary, igneous and metamorphic rocks that have distinct properties (e.g., color, texture) and are formed in different ways.	The Rock Cycle Different Types of Rocks Sedimentary Rocks Igneous Rocks Metamorphic Rocks
2. Explain that rocks are made of one or more minerals.	Using Rocks
3. <i>Identify minerals by their characteristic properties.</i>	–
Life Sciences	
1. Explain that many of the basic functions of organisms are carried out by or within cells and are similar in all organisms.	Animal and Plant Cells
2. Explain that multicellular organisms have a variety of specialized cells, tissues, organs and organ systems that perform specialized functions.	Animal and Plant Cells Cells to Organisms
3. Identify how plant cells differ from animal cells (e.g., cell wall and chloroplasts).	Animal and Plant Cells
4. Recognize that an individual organism does not live forever; therefore reproduction is necessary for the continuation of every species and traits are passed on to the next generation through reproduction.	Causes of Variation
5. Describe that in asexual reproduction all the inherited traits come from a single parent.	Types of Reproduction
6. Describe that in sexual reproduction an egg and sperm unite and some traits come from each parent, so the offspring is never identical to either of its parents.	Types of Reproduction
7. Recognize that likenesses between parents and offspring (e.g., eye color, flower color) are inherited. Other likenesses, such as table manners are learned.	Types of Variation Human Behavior
8. Describe how organisms may interact with one another.	Feeding Types Competition Types of Animal Behavior
Physical Sciences	
1. <i>Explain that equal volumes of different substances usually have different masses.</i>	–
2. Describe that in a chemical change new substances are formed with different properties than the original substance (e.g., rusting, burning).	Types of Chemical Reactions
3. Describe that in a physical change (e.g., state, shape and size) the chemical properties of a substance remain unchanged.	Types of Chemical Reactions

4. Describe that chemical and physical changes occur all around us (e.g., in the human body, cooking and industry).	Everyday Chemical Reactions
5. Explain that the energy found in nonrenewable resources such as fossil fuels (e.g., oil, coal and natural gas) originally came from the sun and may renew slowly over millions of years.	Fossil Fuels Nonrenewable Energy Resources
6. Explain that energy derived from renewable resources such as wind and water is assumed to be available indefinitely.	Renewable Energy
7. Describe how electric energy can be produced from a variety of sources (e.g., sun, wind and coal).	Renewable Energy Nonrenewable Energy Resources
8. Describe how renewable and nonrenewable energy resources can be managed (e.g., fossil fuels, trees and water).	Fossil Fuels Greenhouse Gases
GRADE 7	
Earth and Space Sciences	
1. <i>Explain the biogeochemical cycles which move materials between the lithosphere (land), hydrosphere (water) and atmosphere (air).</i>	–
2. Explain that Earth's capacity to absorb and recycle materials naturally (e.g., smoke, smog and sewage) can change the environmental quality depending on the length of time involved (e.g. global warming).	Greenhouse Gases
3. Describe the water cycle and explain the transfer of energy between the atmosphere and hydrosphere.	The Water Cycle
4. Analyze data on the availability of fresh water that is essential for life and for most industrial and agricultural processes. Describe how rivers, lakes and groundwater can be depleted or polluted becoming less hospitable to life and even becoming unavailable or unsuitable for life.	Acid Rain
5. Make simple weather predictions based on the changing cloud types associated with frontal systems.	What is Weather?
6. <i>Determine how weather observations and measurements are combined to produce weather maps and that data for a specific location at one point in time can be displayed in a station model.</i>	–
7. <i>Read a weather map to interpret local, regional and national weather.</i>	–
8. Describe how temperature and precipitation determine climatic zones (biomes) (e.g., desert, grasslands, forests, tundra and alpine).	Climate Zones

9. Describe the connection between the water cycle and weather-related phenomenon (e.g., tornadoes, floods, droughts and hurricanes).	The Water Cycle Tornados Flooding Hurricanes
Life Sciences	
1. Investigate the great variety of body plans and internal structures found in multicellular organisms.	–
2. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism and commensalism).	Feeding Types
3. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water and soil).	Habitats
4. Investigate how overpopulation impacts an ecosystem.	–
5. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition).	Environmental Change
6. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads and oil spills).	–
7. Explain that photosynthetic cells convert solar energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions.	What is Photosynthesis? Feeding Types
8. Investigate the great diversity among organisms.	Classifying Organisms Adaptations
Physical Sciences	
1. Investigate how matter can change forms but the total amount of matter remains constant.	Conservation of Mass
2. Describe how an object can have potential energy due to its position or chemical composition and can have kinetic energy due to its motion.	What is Energy?
3. Identify different forms of energy (e.g., electrical, mechanical, chemical, thermal, nuclear, radiant and acoustic).	What is Energy?
4. Explain how energy can change forms but the total amount of energy remains constant.	What is Energy?
5. Trace energy transformation in a simple closed system (e.g., a flashlight).	How is Electrical Energy Useful?
GRADE 8	
Earth and Space Sciences	

1. Describe how objects in the solar system are in regular and predictable motions that explain such phenomena as days, years, seasons, eclipses, tides and moon cycles	Days, Years and Seasons The Earth, Moon and Sun
2. Explain that gravitational force is the dominant force determining motions in the solar system and in particular keeps the planets in orbit around the sun.	Gravity
3. <i>Compare the orbits and composition of comets and asteroids with that of Earth.</i>	–
4. <i>Describe the effect that asteroids or meteoroids have when moving through space and sometimes entering planetary atmospheres (e.g., meteor-"shooting star" and meteorite).</i>	–
5. <i>Explain that the universe consists of billions of galaxies that are classified by shape.</i>	–
6. <i>Explain interstellar distances are measured in light years (e.g., the nearest star beyond the sun is 4.3 light years away).</i>	–
7. <i>Examine the life cycle of a star and predict the next likely stage of a star.</i>	–
8. Name and describe tools used to study the universe (e.g., telescopes, probes, satellites and spacecraft).	Exploring Space Satellites
9. Describe the interior structure of Earth and Earth's crust as divided into tectonic plates riding on top of the slow moving currents of magma in the mantle.	The Structure of the Earth What is Plate Tectonics?
10. Explain that most major geological events (e.g., earthquakes, volcanic eruptions, hot spots and mountain building) result from plate motion.	Plate Boundaries Earthquakes
11. <i>Use models to analyze the size and shape of Earth, its surface and its interior (e.g., globes, topographic maps, satellite images).</i>	–
12. Explain that some processes involved in the rock cycle are directly related to thermal energy and forces in the mantle that drive plate motions.	The Rock Cycle What is Plate Tectonics?
13. Describe how landforms are created through a combination of destructive (e.g., weathering and erosion) and constructive processes (e.g., crustal deformation, volcanic eruptions and deposition of sediment).	Biological Weathering Chemical Weathering Physical Weathering Erosion, Transportation and Deposition Sedimentary Rocks Plate Boundaries
14. <i>Explain that folding, faulting and uplifting can rearrange the rock layers so the youngest is not always found on top.</i>	–
15. Illustrate how the three primary types of plate boundaries (transform, divergent and convergent) cause different landforms (e.g., mountains, volcanoes and ocean trenches).	Plate Boundaries
Life Sciences	
1. Describe that asexual reproduction limits the spread of detrimental characteristics through a species and allows for genetic continuity.	Types of Reproduction

2. Recognize that in sexual reproduction new combinations of traits are produced which may increase or decrease an organism's chances for survival.	Types of Reproduction Causes of Variation
3. Explain how variations in structure, behavior or physiology allow some organisms to enhance their reproductive success and survival in a particular environment.	Evolution
4. Explain that diversity of species is developed through gradual processes over many generations (e.g., fossil record).	Evolution
5. Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.	Evolution Environmental Change
Physical Sciences	
1. Describe how the change in the position (motion) of an object is always judged and described in comparison to a reference point.	Distance, Time and Speed
2. Explain that motion describes the change in the position of an object (characterized by a speed and direction) as time changes.	Distance, Time and Speed
3. Explain that an unbalanced force acting on an object changes that object's speed and/or direction.	What Are Forces? Calculating Resultant Force
4. <i>Demonstrate that waves transfer energy</i>	–
5. Demonstrate that vibrations in materials may produce waves that spread away from the source in all directions (e.g., earthquake waves and sound waves).	What is Sound? Earthquakes