

MIDDLE SCHOOL SCIENCE	BOARDWORKS MIDDLE SCHOOL SCIENCE PRESENTATION
<b>Earth and Space Science</b>	
1. Recognize, interpret, and be able to create models of the earth's common physical features in various mapping representations, including contour maps.	-
2. Describe the layers of the earth, including the lithosphere, the hot convecting mantle, and the dense metallic core.	The Structure of the Earth
3. Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.	Heat and Temperature Conduction and Convection Radiation
4. Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.	What is Weather? Wind and Ocean Currents The Water Cycle
5. Describe how the movement of the earth's crustal plates causes both slow changes in the earth's surface (e.g., formation of mountains and ocean basins) and rapid ones (e.g., volcanic eruptions and earthquakes).	What is Plate Tectonics? Plate Boundaries Earthquakes
6. Describe and give examples of ways in which the earth's surface is built up and torn down by natural processes, including deposition of sediments, rock formation, erosion, and weathering.	The Rock Cycle Biological Weathering Chemical Weathering Physical Weathering Erosion, Transportation and Deposition
7. Explain and give examples of how physical evidence, such as fossils and surface features of glaciation, supports theories that the earth has evolved over geologic time.	-
8. Recognize that gravity is a force that pulls all things on and near the earth toward the center of the earth. Gravity plays a major role in the formation of the planets, stars, and solar system and in determining their motions.	Gravity
9. Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun.	The Earth, Moon and Sun
10. Compare and contrast properties and conditions of objects in the solar system (i.e., sun, planets, and moons) to those on Earth (i.e., gravitational force, distance from the sun, speed, movement, temperature, and atmospheric conditions).	The Solar System The Atmosphere Gravity Exploring Space

11. Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.	Days, Years and Seasons
12. Recognize that the universe contains many billions of galaxies, and that each galaxy contains many billions of stars.	The Solar System
<b>Life Science</b>	
1. Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.	Classifying Organisms
2. Recognize that all organisms are composed of cells, and that many organisms are single-celled (unicellular), e.g., bacteria, yeast. In these single-celled organisms, one cell must carry out all of the basic functions of life.	Animal and Plant Cells What Are Microbes?
3. Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).	Animal and Plant Cells
4. Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function is similar in all living organisms.	Animal and Plant Cells Releasing Energy
5. Describe the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.	Cells to Organisms
6. Identify the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other.	Digestion Chemical Digestion Respiration and the Circulatory System Releasing Energy The Respiratory System The Endocrine System The Musculoskeletal System Fighting Disease The Nervous System Human Behavior Human Sex Cells and Systems
7. Recognize that every organism requires a set of instructions that specifies its traits. These instructions are stored in the organism's chromosomes. Heredity is the passage of these instructions from one generation to another.	Causes of Variation Genes and Alleles Types of Reproduction
8. Recognize that hereditary information is contained in genes located in the chromosomes of each cell. A human cell contains about 30,000 different genes on 23 different chromosomes.	Cause of Variation Inheritance Genes and Alleles

9. Compare sexual reproduction (offspring inherit half of their genes from each parent) with asexual reproduction (offspring is an identical copy of the parent's cell).	Types of Reproduction
10. Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.	Causes of Variation Types of Variation Evolution
11. Recognize that evidence drawn from geology, fossils, and comparative anatomy provides the basis of the theory of evolution.	Evolution
12. Relate the extinction of species to a mismatch of adaptation and the environment.	Evolution Environmental Change
13. Give examples of ways in which organisms interact and have different functions within an ecosystem that enable the ecosystem to survive.	Feeding Types Food Chains Food Webs
14. Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.	Feeding Types Food Chains Food Webs Pyramids of Number and Biomass
15. Explain how dead plants and animals are broken down by other living organisms and how this process contributes to the system as a whole.	Pyramids of Number and Biomass
16. Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars from carbon dioxide and water through a process called photosynthesis. This food can be used immediately, stored for later use, or used by other organisms.	What is Photosynthesis? Feeding Types
17. Identify ways in which ecosystems have changed throughout geologic time in response to physical conditions, interactions among organisms, and the actions of humans. Describe how changes may be catastrophes such as volcanic eruptions or ice storms.	Environmental Change
18. Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.	Evolution
<b>Physical Sciences</b>	
1. Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.	Gravity
2. Differentiate between volume and mass. Define density.	–
3. Recognize that the measurement of volume and mass requires understanding of the sensitivity of measurement tools (e.g., rulers, graduated cylinders, balances) and knowledge and appropriate use of significant digits.	–
4. Explain and give examples of how mass is conserved in a closed system.	Conservation of Mass

5. Recognize that there are more than 100 elements that combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.	What Are Atoms? Elements and Compounds
6. Differentiate between an atom (the smallest unit of an element that maintains the characteristics of that element) and a molecule (the smallest unit of a compound that maintains the characteristics of that compound).	What Are Atoms? Atomic Structure Elements and Compounds
7. Give basic examples of elements and compounds	Elements and Compounds
8. Differentiate between mixtures and pure substances.	What is a Mixture?
9. Recognize that a substance (element or compound) has a melting point and a boiling point, both of which are independent of the amount of the sample.	Changes of Matter
10. Differentiate between physical changes and chemical changes.	Types of Chemical Reactions
11. Explain and give examples of how the motion of an object can be described by its position, direction of motion, and speed.	Distance, Time and Speed
12. Graph and interpret distance vs. time graphs for constant speed.	Graphing Speed
13. Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.	What is Energy?
14. Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.	Heat and Temperature
15. Explain the effect of heat on particle motion through a description of what happens to particles during a change in phase.	Particles in Action Changing State
16. Give examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.	Heat and Temperature