

**Powder Mill Middle School**  
**Grade 8 Science Curriculum Map 2009-2010**

**Document 2:**

September- October	October-February	February-April	April-June
Space Science / Technology & Engineering	Life Science	Physical Science/Earth Science	MCAS Review
<p>ES. 9 Describe lunar and solar eclipses, the observed moon phases, and tides. Relate them to the relative positions of the earth, moon, and sun.</p> <p>ES. 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.</p> <p>T.E. 5.1 Describe and explain parts of a structure, e.g., foundation, flooring, decking, wall, roofing systems.</p> <p>T.E. 5.2 Identify and describe three major types of bridges (e.g., arch, beam, and suspension) and their appropriate uses (e.g., site, span, resources, and load).</p> <p>T.E. 5.3 Explain how the forces of tension, compression, torsion, bending, and shear affect the performance of bridges.</p> <p>T.E. 5.4 Describe and explain the effects of loads and structural shapes on bridges.</p>	<p>LS. 1 Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.</p> <p>LS. 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.</p> <p>LS. 3 Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).</p> <p>LS. 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.</p> <p>LS. 5 Describe the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms.</p> <p>LS. 6 Identify the general functions of the major systems of the human body (digestion, <u>respiration</u>, reproduction, <u>circulation</u>, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other.</p> <p>LS. 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.</p> <p>LS. 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.</p> <p>LS. 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).</p>	<p>PS. 11 Explain and give examples of how the motion of an object can be described by its position, direction of motion, and speed.</p> <p>PS. 12 Graph and interpret distance vs. time graphs for constant speed.</p> <p>ES 1: Recognize, interpret, and be able to create models of the earth's common physical features in various mapping representations, including contour maps.</p> <p>ES 2: Describe the layers of the earth, including the lithosphere, the hot convecting mantle, and the dense metallic core.</p> <p>ES 3: Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.</p> <p>ES 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.</p> <p>ES 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).</p> <p>ES 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.</p> <p>ES 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.</p>	<p>PS. 1 Differentiate between weight and mass, recognizing that weight is the amount of gravitational pull on an object.</p> <p>PS. 2 Differentiate between volume and mass. Define density.</p> <p>PS. 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.</p> <p>PS. 4 Explain and give examples of how mass is conserved in a closed system.</p> <p>PS. 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.</p> <p>PS. 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).</p> <p>PS. 7 Give basic examples of elements and compounds.</p> <p>PS. 8 Differentiate between mixtures and pure substances.</p> <p>PS. 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.</p> <p>PS. 10 Differentiate between physical changes and chemical changes.</p> <p>PS. 13 Differentiate between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.</p> <p>PS. 14 Recognize that heat is a form of energy and that temperature change results from adding or taking away heat from a system.</p> <p>PS. 15 Explain the effect of heat on particle motion through a description of what happens to particles during a change in phase.</p>

			<p><b>PS. 16 Give examples of how heat moves in predictable ways, moving from warmer objects to cooler ones until they reach equilibrium.</b></p> <p><b>ES. 3 Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through the earth's system.</b></p> <p><b>LS. 10 Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.</b></p> <p><b>LS. 11 Recognize that evidence drawn from geology, fossils, and comparative anatomy provides the basis of the theory of evolution.</b></p> <p><b>LS. 12 Relate the extinction of species to a mismatch of adaptation and the environment.</b></p> <p><b>LS. 13 Give examples of ways in which organisms interact and have different functions within an ecosystem that enables the ecosystem to survive.</b></p> <p><b>LS. 14 Explain the roles and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.</b></p> <p><b>LS. 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.</b></p> <p><b>LS. 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.</b></p> <p><b>LS. 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.</b></p> <p><b>LS. 18 Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.</b></p>
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