

5th /6th (Earth Science)/ 7th (Life Science)
Essential Standards
Science

Based on State Key Content Standards compiled by the Pulliam Group

| Strand | Standard 5 th Grade | Standard 6 th Grade(Earth) | Standard 7 th Grade (Life) |
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| Physical Science | <p>1. Elements and their combinations account for all the varied types of matter in the world.</p> <p>a. Students know that during chemical reactions the atoms in the reactants rearrange to form products with different properties.</p> <p>b. Students know all mater is made of atoms, which combine to form molecules.</p> <p>c. Students know that metals have properties in common, such as high electrical and thermal conductivity. Some metals, such as aluminum (Al), iron (Fe), nickel (Ni), copper (Cu), silver (Ag), and gold (Au), are pure elements; other, such as steel and brass, are composed of a combination of elemental metals.</p> | | |
| Life Science | <p>2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials.</p> <p>a. Students know that many multi-cellular organisms have specialized structures to support the transport of materials.</p> <p>b. Students know how blood circulates through the heart, lungs, and body and how carbon dioxide and oxygen are exchanged in the lungs and tissues.</p> <p>c. Students know the sequential steps of digestion and the roles of teeth and the mouth, esophagus, stomach, small intestine, large intestine, and colon in the function of the digestive system.</p> | | <p>1. Cell Biology- All living organisms are composed of cells. Students should know that:</p> <p>a. cells function similarly in all living organisms.</p> <p>b. the characteristics that distinguish plant cells from animal cells, including chloroplasts and cell walls.</p> <p>c. the nucleus is the repository for genetic information in plant and animal cells.</p> <p>e. cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes.</p> <p>2. Genetics- Cells contain genetic instructions that specify its traits. Students should know that:</p> <p>b. sexual reproduction produces offspring that inherit half their genes from each parent.</p> <p>c. an inherited trait can be determined by one or more genes.</p> <p>d. plant and animal cells contain many thousands of different genes and typical have two copies of every gene. The copies, or alleles, of the gene may or may not be identical, and one may be dominant in determining the phenotype while the other is recessive.</p> <p>e. DNA is the genetic material of living organisms and is located in the chromosomes of each cell.</p> <p>3. Evolution- Evolution accounts for diversity of species.</p> <p>Students should know that:</p> <p>a. that genetic variation and environmental factors cause evolution and diversity of organisms.</p> <p>c. how independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.</p> |

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| <p>Earth Science</p> | <p>3. Water on Earth moves between the oceans and land through the processes of evaporation and condensation.</p> <p>a. Students know that most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.</p> <p>b. Students know that when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.</p> <p>c. Students know that water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.</p> <p>4. Air movements cause changing weather patterns.</p> <p>a. Students know that uneven heating of Earth causes air movements.</p> <p>b. Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.</p> <p>d. Students know how to use weather maps and data to predict local weather and know that weather forecasts depend on many variables.</p> <p>5. The solar system consists of planets and other bodies that orbit the sun in predictable paths.</p> <p>a. Students know that the Sun, and average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.</p> <p>b. Students know that the solar system includes the planet Earth, the Moon, the Sun, eight other planets and their satellites, and smaller objects such as asteroids and comets.</p> | <p>1. Plate tectonics and Earth's Structure, Earth's surface, and major geologic events are caused by Plate Tectonics. Students should know that:</p> <p>a. evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and mid-ocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.</p> <p>b. Earth is composed of several layers: a cold, brittle lithosphere; a hot, convection mantle; and a dense, metallic core.</p> <p>c. Lithospheric plates the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.</p> <p>d. earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface.</p> <p>e. major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.</p> <p>2. Shaping Earth's Surface- Topography is shaped by weathering and soil deposits. Students should know that:</p> <p>a. water running downhill is the dominant process in shaping the landscape, including California's landscape.</p> <p>b. rivers and streams are dynamic systems that erode, transport sediment; change courses, and flood their banks in natural and recurring patterns.</p> <p>d. earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.</p> <p>3. Thermal Energy Heat moves from warmer to cooler by various means. Students should know that:</p> <p>a. energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.</p> <p>b. when fuel is consumed, most of the energy released becomes heat energy.</p> <p>c. heat flows in solids by conduction and in fluids by conduction and convection.</p> <p>4. Energy in the Earth's System- The Earth's surface is affected by the transfer of energy. Students should know that:</p> <p>a. the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.</p> <p>b. solar energy reaches Earth through radiation, mostly in the form of visible light.</p> <p>c. heat from Earth's interior reaches the surface primarily through convection.</p> <p>e. differences in pressure, heat, air movement, and humidity results in change of weather.</p> <p>5. Ecology- Organisms in ecosystems exchange energy and nutrients. Students should know that:</p> <p>a. energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organisms to organism through food webs.</p> | <p>4. Evidence from rocks allows us to understand evolution. Students should know that:</p> <p>a. that Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time.</p> <p>b. that the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.</p> <p>c. that fossils provide evidence of how life and environmental conditions have changed.</p> <p>5. Structure and functions in living systems. Structure and function are complementary in animals and plants. Students should know:</p> <p>a. that plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.</p> <p>b. that organ systems function because of the contributions of individual organs, tissues, and cells. The failure of any part can affect the entire system.</p> <p>c. how bones and muscles work together to provide a structural framework for movement.</p> <p>g. how to relate the structures of the eye and ear to their functions.</p> <p>6. Physical principles underlie biological systems. Students should know that:</p> <p>b. that for an object to be seen, light emitted by or scattered from it must be detected by the eye.</p> <p>d. how simple lenses are used in a magnifying glass, the eye, a camera, a telescope, and a microscope.</p> <p>f. light can be reflected, refracted, transmitted, and absorbed by matter</p> |
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| | | <p>b. matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.</p> <p>c. populations of organisms can be categorized by the functions they serve in an ecosystem.</p> <p>e. the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as light, water, temperature, and soil composition.</p> <p>6. Resources- Chemistry is the basis of biological systems. Students should know that:</p> <p>b. different energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and how to classify them as renewable or non-renewable.</p> | |
| Investigations and Experimentation | <p>c. Students will plan and conduct a simple investigation from a student-developed question and write instructions so others can carry out the procedure.</p> <p>f. Students will select appropriate tools and make quantitative observations.</p> <p>g. Students will record data by using appropriate graphic representations and make inferences based on those data.</p> <p>i. Students will write a report of an investigation that includes conducting test, collecting data or examining evidence, and drawing conclusions.</p> | <p>7. Students will develop a hypothesis and perform investigations.</p> <p>b. select and use appropriate tools and technology to perform tests, collect, display data.</p> <p>c. construct appropriate graphs from data and develop quantitative statements about the relationships between variables.</p> <p>d. communicate the steps and results from an investigation in written reports and oral presentations.</p> <p>f. read a topographic map and a geologic map for evidence provided on the maps.</p> <p>h. identify changes in natural phenomena over time without manipulating the phenomena. (e.g., a tree limb, a grove of trees, a stream, and a hill slope).</p> | <p>7. Students will develop questions and perform investigations.</p> <p>a. Select and use appropriate tools and technology to perform tests, collect and display data.</p> <p>c. Communicate the logical connection among hypotheses, science concepts, test conducted, data collected, and conclusions drawn from scientific evidence.</p> <p>d. Construct models, and appropriately labeled diagrams to communicate scientific knowledge (e.g., cell structure).</p> <p>e. Communicate the steps and results from an investigation in written reports and oral presentations.</p> |