

Oneness-Family School - Sixth - Eighth Grade – Science Benchmarks Overview

Academy: Natural World

NATURAL WORLD		
Biology	Physics	Chemistry
<p>Scientific Thinking</p> <p>Can record observations in detail</p> <p>Can describe using clear quantitative and qualitative terms</p> <p>Can look for patterns and draw conclusions</p> <p>Can justify claims using evidence from observations</p> <p>Can create graphic organizers that identify key points and connections between topics</p> <p>Can design and conduct experiments controlling all but one variable</p> <p>Can make and record observations and collect data</p> <p>Can analyze data and explain results</p> <p>Can interpret graphs and diagrams and draw conclusions</p> <p>Can use a graph to display trends</p>	<p>Scientific Thinking</p> <p>Can record observations in detail</p> <p>Can describe using clear quantitative and qualitative terms</p> <p>Can look for patterns and draw conclusions</p> <p>Can justify claims using evidence from observations</p> <p>Can create graphic organizers that identify key points and connections between topics</p> <p>Can design and conduct experiments controlling all but one variable</p> <p>Can make and record observations and collect data</p> <p>Can analyze data and explain results</p> <p>Can interpret graphs and diagrams and draw conclusions</p> <p>Can use a graph to display trends</p>	<p>Scientific Thinking</p> <p>Can record observations in detail</p> <p>Can describe using clear quantitative and qualitative terms</p> <p>Can look for patterns and draw conclusions</p> <p>Can justify claims using evidence from observations</p> <p>Can create graphic organizers that identify key points and connections between topics</p> <p>Can design and conduct experiments controlling all but one variable</p> <p>Can make and record observations and collect data</p> <p>Can analyze data and explain results</p> <p>Can interpret graphs and diagrams and draw conclusions</p> <p>Can use a graph to display trends</p>

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<p>Can apply patterns and rules to new contexts to make conjectures</p> <p>Can measure distances accurately using the International System of Units</p> <p>Can read for understanding by analyzing images, identifying main ideas and supporting details, relating cause and effect, and comparing and contrasting</p> <p>Can analyze graphics, graphs, charts</p> <p>Scientific Understanding</p> <p>Can draw observations of specimens seen under the microscope</p> <p>Can describe the function of cell structures and organelles in a plant and animal cell</p> <p>Can distinguish between a plant and animal cell based on structural features</p> <p>Can identify the main biochemical compounds in cells and their functions</p> <p>Can discuss the ways that solids and liquids move in and out of the cell, including active and passive transport, diffusion, osmosis, and facilitated diffusion</p>	<p>Can apply patterns and rules to new contexts to make conjectures</p> <p>Can measure distances accurately using the International System of Units</p> <p>Can read for understanding by analyzing images, identifying main ideas and supporting details, relating cause and effect, and comparing and contrasting</p> <p>Can analyze graphics, graphs, and charts</p> <p>Can apply a formula to make calculations</p> <p>Scientific Understanding</p> <p>Can use the formula $s=d/t$ to calculate speed, distance, and time</p> <p>Can graph the motion of an object</p> <p>Can describe an object's motion based on a graph</p> <p>Can calculate and graph the acceleration of an object</p> <p>Can analyze speed v. time and distance v. time graphs</p> <p>Can identify multiple forces acting on an object</p>	<p>Can apply patterns and rules to new contexts to make conjectures</p> <p>Can measure distances accurately using the International System of Units</p> <p>Can read for understanding by analyzing images, identifying main ideas and supporting details, relating cause and effect, and comparing and contrasting</p> <p>Can analyze graphics, graphs, and charts</p> <p>Can apply a formula to make calculations</p> <p>Scientific Understanding</p> <p>Can discuss how elements, compounds, and mixtures are related to each other</p> <p>Can distinguish different types of mixtures</p> <p>Can determine the density of liquids and solids</p> <p>Can distinguish between physical or chemical properties of a substance</p> <p>Can discuss what happens to a substance in a physical and a chemical change</p> <p>Can explain how the atoms or molecules in a substance behave in different states</p>

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<p>Can describe what happens during photosynthesis and respiration</p> <p>Can compare and contrast the processes of photosynthesis and respiration</p> <p>Can list the characteristics that all living things share</p> <p>Can identify what all living things need to survive</p> <p>Can explain what cells are</p> <p>Can describe how scientists first observed cells and developed the cell theory</p> <p>Can describe how cells are organized in multi-cellular organisms</p> <p>Can describe the organization of the levels of classification</p> <p>Can explain why biologists classify organisms and how they assign scientific names</p> <p>Can use taxonomic keys to identify organisms</p> <p>Can explain the relationship between evolution and classification</p> <p>Can name & describe the characteristics of viruses and how they multiply</p>	<p>Can use the formula $F=ma$ to explain how changes in mass and force affect acceleration.</p> <p>Can identify action and reaction forces.</p> <p>Can use the formula $\text{momentum}=\text{mass} \times \text{velocity}$ to calculate momentum and velocity</p> <p>Can classify examples of kinetic and potential energy</p> <p>Can classify examples of forms of energy (electromagnetic, electrical, chemical, thermal, nuclear, mechanical)</p> <p>Can use the formula $\text{work}=\text{force} \times \text{distance}$ to calculate work, force, and distance.</p> <p>Can use the formula $\text{power}=\text{work}/\text{time}$ to calculate power, work, and time</p> <p>Can distinguish between renewable and non-renewable energy sources</p> <p>Can use understanding of the specifics of an energy generating system to generalize the steps in the process of generating electricity</p> <p>Can classify materials as conductors or insulators</p> <p>Can use tools and electrical supplies to build and investigate circuits</p> <p>Can draw a diagram of a circuit</p> <p>Can identify circuits as series or parallel</p>	<p>Can explain how the arrangement of atoms or molecules in various states relate to the characteristics of that state</p> <p>Can discuss how temperature affects the state of a substance</p> <p>Can describe the relationship between energy and changes in state</p> <p>Can explain relationships between volume, pressure, and temperature in gases</p> <p>Can explain how our understanding of the structure of the atom changed over time by referencing the discoveries of specific scientists</p> <p>Can discuss our current understanding of the structure of the atom</p> <p>Can identify the particles that make up the atom, including their charges and where in the atom they are found</p> <p>Can determine the number of protons, neutrons, and electrons in an atom given the atomic weight or the atomic number</p> <p>Can define and identify isotopes</p> <p>Can identify types of radioactive decay and explain how half-lives are measured</p> <p>Can identify and find information on the periodic table?</p>

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<p>Can discuss both positive and negative ways that viruses affect living things</p> <p>Can name and describe structures, shapes, and sizes of a bacterial cell</p> <p>Can explain how bacteria obtain food and energy and how they reproduce</p> <p>Can describe the positive roles that bacteria play in the natural world</p> <p>Can describe the characteristics of animal-like, plant-like, and fungus-like protists and give examples of each</p> <p>Can describe the roles fungi play in the natural world</p> <p>Can name and describe the characteristics of fungi and how they reproduce</p> <p>Can explain how animals are classified</p> <p>Can describe the levels of organization in animal bodies</p> <p>Can infer animal body structures based on their symmetry</p> <p>Can identify the characteristics of invertebrates and describe the major groups of them</p> <p>Can identify the characters of chordates and vertebrates</p>	<p>Can use the formula $\text{power} = \text{voltage} \times \text{current}$ to calculate current</p> <p>Can identify the properties of magnets</p> <p>Can explain the relationship between magnetic and electric fields</p> <p>Can experiment to make improvements in a basic motor and electromagnet</p> <p>Can explain how a motor and an electromagnet work</p> <p>Can discuss the pros and cons of various energy sources used to generate electricity</p> <p>Can discuss their own energy use and changes that can reduce their own energy consumption</p> <p>Can identify current global energy issues</p> <p>Can compare energy use around the world</p> <p>Can discuss social, economic, and environmental impacts of relying on non-renewable energy sources</p> <p>Can discuss personal and governmental strategies to conserve energy and improve efficiency</p>	<p>Can explain how the periodic table is organized</p> <p>Can discuss similarity between elements within a family</p> <p>Can identify patterns and trends across the periodic table</p> <p>Can translate between chemical formulas and names of acids and bases</p> <p>Can balance chemical equations</p>
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<p>Can describe the major groups of vertebrates</p> <p>Can describe the framework for support and protection in animal bodies</p> <p>Can explain the role of muscle in animal bodies</p> <p>Can explain the function of the nervous system</p> <p>Can compare how the nervous system of animals differ</p> <p>Can explain how the muscles, skeleton, and nervous system interact to allow animal movement</p> <p>Can compare adaptations in organisms that help them move in a specific environment</p> <p>Can compare the different ways animals obtain and digest food</p> <p>Can compare the different respiratory structures of animals</p> <p>Can describe the two types of circulatory systems and explain how closed circulatory systems differ among vertebrates</p>		

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<p>Can compare how different animals get rid of waste products</p> <p>Can compare asexual and sexual reproduction in invertebrates and vertebrates</p> <p>Can identify the events that take place during the three stages of the cell cycle</p> <p>Can describe the results of Mendel's experiments</p> <p>Can identify the role of alleles in controlling the inheritance of traits</p> <p>Can define probability and describe how it helps explain the results of genetic crosses</p> <p>Can explain what is meant by phenotype and genotype</p> <p>Can describe at least three complex patterns of inheritance</p> <p>Can discuss how characteristics result from inheritance and environmental factors</p> <p>Can describe the role chromosomes and genes play in inheritance</p> <p>Can identify the events that occur during meiosis and fertilization</p>		
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<p>Can describe how a cell produces proteins Can describe how DNA copies itself</p> <p>Can identify how mutations can affect an organism</p> <p>Can explain how cancer is related to mutations and the cell cycle</p> <p>Can identify some patterns of inheritance in humans</p> <p>Can explain how genetic disorders are traced, diagnosed, and treated</p> <p>Can identify biotic and abiotic parts of a habitat</p> <p>Can describe the levels of organization within an ecosystem</p> <p>Can explain the causes of changes in population size</p> <p>Can identify factors that limit population growth</p> <p>Can explain how adaptations help an organism survive</p> <p>Can describe competition and predation Can identify the three types of symbiosis</p> <p>Can name and describe the energy roles that organisms play in an ecosystem</p>		
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<p>Can explain how energy moves through an ecosystem</p> <p>Can name the six major biomes found on Earth</p> <p>Can name the two major types of aquatic ecosystems</p> <p>Can identify what factors affect species dispersal</p> <p>Can identify general categories of environmental issues</p> <p>Can describe how decision makers balance opposing needs and concerns</p> <p>Can explain what natural resources are and distinguish between renewable and nonrenewable resources</p> <p>Can explain why natural resource are important</p> <p>Can explain the value of biodiversity Can explain how the human population has grown over time</p> <p>Can identify factors that affect the rate of human population growth</p> <p>Can describe how forests can be managed as renewable resources</p>		
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<p>Can describe how fisheries can be managed for a sustainable yield</p> <p>Can identify the factors that affect biodiversity</p> <p>Can identify ways that human activity threatens and protects biodiversity</p>		