NATURAL WORLD

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

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

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

Biology	Physics	Chemistry
Can discuss both positive and negative ways that viruses affect living things Can name and describe structures, shapes, and sizes of a bacterial cell Can explain how bacteria obtain food and energy and how they reproduce Can describe the positive roles that bacteria play in the natural world Can describe the characteristics of animal-like, plant-like, and fungus-like protists and give examples of each Can describe the roles fungi play in the natural world Can name and describe the characteristics of fungi and how they reproduce Can explain how animals are classified Can describe the levels of organization in animal bodies Can infer animal body structures based on their symmetry Can identify the characteristics of invertebrates and describe the major groups of them Can identify the characters of chordates and vertebrates	Can use the formula power=voltage x current to calculate current Can identify the properties of magnets Can explain the relationship between magnetic and electric fields Can experiment to make improvements in a basic motor and electromagnet Can explain how a motor and an electromagnet work Can discuss the pros and cons of various energy sources used to generate electricity Can discuss their own energy use and changes that can reduce their own energy consumption Can identify current global energy issues Can compare energy use around the world Can discuss social, economic, and environmental impacts of relying on non-renewable energy sources Can discuss personal and governmental strategies to conserve energy and improve efficiency	Can explain how the periodic table is organized Can discuss similarity between elements within a family Can identify patterns and trends across the periodic table Can translate between chemical formulas and names of acids and bases Can balance chemical equations

Biology	Physics	Chemistry
Can describe the major groups of vertebrates Can describe the framework for support and protection in animal bodies Can explain the role of muscle in animal bodies Can explain the function of the nervous system Can compare how the nervous system of animals differ Can explain how the muscles, skeleton, and nervous system interact to allow animal movement Can compare adaptations in organisms that help them move in a specific environment Can compare the different ways animals obtain and digest food Can compare the different respiratory structures of animals Can describe the two types of circulatory systems and explain how closed circulatory systems differ among vertebrates		

Biology	Physics	Chemistry
Can compare how different animals get rid of waste products Can compare asexual and sexual reproduction in invertebrates and vertebrates Can identify the events that take place during the three stages of the cell cycle Can describe the results of Mendel's experiments Can identify the role of alleles in controlling the inheritance of traits Can define probability and describe how it helps explain the results of genetic crosses Can explain what is meant by phenotype and genotype Can describe at least three complex patterns of inheritance Can discuss how characteristics result from inheritance and environmental factors Can describe the role chromosomes and genes play in inheritance Can identify the events that occur during meiosis and fertilization		

Biology	Physics	Chemistry
Can describe how a cell produces proteins Can describe how DNA copies itself Can identify how mutations can affect an organism Can explain how cancer is related to mutations and the cell cycle Can identify some patterns of inheritance in humans Can explain how genetic disorders are traced, diagnosed, and treated Can identify biotic and abiotic parts of a habitat Can describe the levels of organization within an ecosystem Can explain the causes of changes in population size Can identify factors that limit population growth Can explain how adaptations help an organism survive Can describe competition and predation Can identify the three types of symbiosis Can name and describe the energy roles that organisms play in an ecosystem		

Biology	Physics	Chemistry
Can explain how energy moves through an ecosystem Can name the six major biomes found on Earth Can name the two major types of aquatic ecosystems Can identify what factors affect species dispersal Can identify general categories of environmental issues Can describe how decision makers balance opposing needs and concerns Can explain what natural resources are and distinguish between renewable and nonrenewable resources Can explain why natural resource are important Can explain the value of biodiversity Can explain how the human population has grown over time Can identify factors that affect the rate of human population growth Can describe how forests can be managed as renewable resources		

Biology	Physics	Chemistry
Can describe how fisheries can be managed for a sustainable yield Can identify the factors that affect biodiversity Can identify ways that human activity threatens and protects biodiversity		