

Jemez Valley Public Schools
FOURTH GRADE SCIENCE • CONTENT MAP

Quadrant I	Quadrant II	Quadrant III	Quadrant IV
Content Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting and validating to think critically Strand 1: Scientific Thinking and Practice			
<ul style="list-style-type: none"> ● Use scientific methods to observe, collect, and record data (year long) ● Use instruments to perform investigations (e.g., timers, balances) and communicate findings. ● Use mathematical skills and vocabulary when collecting data (year long) ● Use, and explain how to use, scientific methods to observe, collect, record, analyze, and predict (year long) ● Use mathematical equations to formulate and justify predictions based on cause-and-effect relationship ● Explain and communicate data collected through scientific investigations in a variety of settings (year long) ● Use mathematical skills and vocabulary to analyze data, understand patterns and communicate findings (year long) 	<ul style="list-style-type: none"> ● Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data. (year long) ● Identify simple mathematical relationships in a scientific investigation (e.g., the relationship of the density of materials that will or will not float in water to the density of water). ● Communicate ideas and present findings about scientific investigations that are open to critique from others. ● Understand how data are used to explain how a simple system functions (e.g., a thermometer to measure heat loss as water cools). 	<ul style="list-style-type: none"> ● Conduct multiple trials using simple mathematical techniques to make and test predictions. ● Conduct multiple trials to test a prediction, draw logical conclusions, and construct and interpret graphs from measurements. Differentiate observation from interpretation and understand that a scientific explanation comes in part from what is observed and in part from how the observation is interpreted. ● Describe how scientific investigations may differ from one another (e.g., observations of nature, measurements of things changing over time) ● Describe scientific methods to conduct investigations including formulating testable hypotheses, making systematic observations, developing logical conclusions and communicating findings 	<ul style="list-style-type: none"> ● Describe how scientific conclusions are subject to peer and public review ● Identify the attributes to be measured in a scientific investigation and describe the units, systems and processes for making the measurement
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Standard II: (Physical Science) Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy. Strand 2: Content of Science			
<ul style="list-style-type: none"> ● Know that materials are made up of small particles (atoms and molecules) ● Know that changes to matter may be chemical or physical (year long) ● Identify forces and describe the motion of objects. (year long) ● Know that energy is needed to get things done and that energy has different forms. (year long) ● Know that the mass of the same amount of material remains constant whether it is together, in parts, or in a different state. (year long) ● Identify the characteristics of several different forms of energy and describe how energy can be converted from one form to another (e.g., light to heat, motion to heat, electricity to heat, light, or motion). ● Recognize that energy can be stored in many ways (e.g., potential energy in gravity or springs, chemical energy in batteries). 	<ul style="list-style-type: none"> ● Know that energy can be carried from one place to another by waves (e.g., water waves, sound waves), by electric currents, and by moving objects ● Describe the motion of an object by measuring its change of position over a period of time. ● Describe that gravity exerts more force on objects with greater mass (e.g., it takes more force to hold up a heavy object than a lighter one). ● Demonstrate how electricity flows through a simple circuit (e.g., by constructing one) ● Describe how some forces act on contact and other forces act at a distance (e.g., a person pushing a rock versus gravity acting on a rock). 	<ul style="list-style-type: none"> ● Describe how some waves move through materials (e.g., water, sound) and how others can move through a vacuum (e.g., x-ray, television, radio). ● Know that energy can be carried from one place to another by waves (e.g., water waves, sound waves), by electric currents, and by moving objects ● Know that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original substances (year long) ● Describe how matter changes from one phase to another (e.g., condensation, evaporation). ● Explore how heat is transferred from hotter to cooler materials or regions until both reach the same temperature 	<ul style="list-style-type: none"> ● Describe how matter is made up of particles (atoms) that can combine to form molecules and that these particles are too small to see with the naked eye. ● Identify forces in nature (e.g., gravity, magnetism, electricity, friction).

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Standard III: (Life Science) Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.			
Strand 3: Content of Science			
	<ul style="list-style-type: none"> • Describe how all living things are made up of smaller units that are called cells. • Recognize that the human body is organized from cells, to tissues, to organs, to systems, to the organism. • Describe how roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight (photosynthesis). • Know that in any particular environment some kinds of plants and animals survive well, some survive less well, and others cannot survive at all. 	<ul style="list-style-type: none"> • Know that the human body has many parts that interact to function as systems (e.g., skeletal, muscular) and describe the parts and their specific functions in selected systems (e.g., the nose, lungs, and diaphragm in the respiratory system). • Know that humans and other living things have senses to help them detect stimuli, and that sensation (e.g., hunger) and stimuli (e.g., changes in the environment) influence the behavior of organisms. • Know that a change in physical structure or behavior can improve an organism's chance of survival (e.g., a chameleon changes color, a turtle pulls its head into its shell, a plant grows toward the light). • Explain that different living organisms have distinctive structures and body systems that serve specific functions (e.g., walking, flying, swimming). • Describe how some living organisms have developed characteristics from generation to generation to improve chances of survival (e.g., spines on cacti, long beaks on hummingbirds, good eyesight on hawks). • Describe the components of and relationships among organisms in a food chain (e.g., plants are the primary source of energy for living systems). • Discuss the components of habitats and ecosystems (producers, consumers, decomposers, predators). • Identify examples of how human activity impacts the environment. 	<ul style="list-style-type: none"> • Describe characteristics of an organism that are inherited from its parents (e.g., eye color in humans, flower color in plants) and other characteristics that are learned or result from interactions with the environment. • Describe how all living organisms are composed of cells from one to many trillions, and that cells are usually only visible through a microscope.

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Quadrant I	Quadrant II	Quadrant III	Quadrant IV
Standard: (Earth Science) Understand the structure of the Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of the Earth's systems. Strand 4 : Content of Science			
	<ul style="list-style-type: none"> • Describe how weather patterns generally move from west to east in the US • Know that the pattern of stars (e.g., constellations) stays the same although they appear to move across the sky nightly due to Earth's Rotation • Know that the properties of rocks and minerals reflect the processes that shape them • Understand that the number of stars visible through a telescope is much greater than the number visible to the naked eye. 	<ul style="list-style-type: none"> • Know that there are various types of telescopes that use different forms of light to observe distant objects in the sky. • Know that local weather information describes patterns of change over a period of time (e.g., temperature, precipitation symbols, cloud conditions, wind speed/direction). • Describe how the Earth is part of a larger solar system, which is part of an even larger galaxy (Milky Way), which is one of many galaxies 	<ul style="list-style-type: none"> • Discuss how the water cycle relates to weather • Describe how the seasons are caused by Earth's motion around the sun and the tilt of Earth's axis of rotation.
Quadrant I	Quadrant II	Quadrant III	Quadrant IV
Standard: Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies. Strand 5: Science and Society			
<ul style="list-style-type: none"> • Know that science has created ways to store and retrieve information (e.g., paper and ink, printing press, computers, CD ROMs) but that these are not perfect • Know that through science and technology, a wide variety of materials not appearing in nature have become available 	<ul style="list-style-type: none"> • Know that both men and women of all races and social backgrounds choose science as a career. • Describe that through science and technology, a wide variety of materials not appearing in nature have become available. Continue in January 	<ul style="list-style-type: none"> • Describe that through science and technology, a wide variety of materials not appearing in nature have become available. Continue from December. • Know that science has identified substances called pollutants that get into the environment and can be harmful to living things. • Identify how various technologies have affected the lives of individuals (e.g., transportation, entertainment, health). 	<ul style="list-style-type: none"> • Identify how various technologies have affected the lives of individuals (e.g., transportation, entertainment, health). • Describe how science influences decisions made by individuals and societies.