

Achievement Indicators for Science
Grades 9-12

Content Standard N12A				
Students understand that a variety of communication methods can be used to share scientific information				
Content Benchmark	Work at the Emergent/ Developing level may indicate ability to .	Work at the Approaches level may indicate ability to ...	Work at the Meets level demonstrates ability to...	Work at the Exceeds level demonstrates ability to...
<p>N.12.A.1 Students know tables, charts, illustrations and graphs can be used in making arguments and claims in oral and written presentations.</p> <p>N.12.A.2 Students know scientists maintain a permanent record of procedures, data, analyses, decisions, and understandings of scientific investigations.</p> <p>N.12.A.3 Students know repeated experimentation allows for statistical analyses and unbiased conclusions.</p> <p>N.12.A.4 Students know how to safely conduct an original scientific investigation using appropriate tools and technology.</p> <p>N.12.A.5 Students know models and modeling can be used to identify and predict cause-effect relationships.</p> <p>N.12.A.6 Students know organizational schema can be used to represent and describe relationships of sets.</p>	<p>Recognize the role of evidence to support claims in a scientific investigation.</p> <p>Compare the results of classroom experiments to current scientific knowledge.</p> <p>Match a scientific conclusion to the evidence from which it was drawn.</p> <p>Identify a reasonable prediction based on information represented on graphs and charts that they create.</p> <p>Design and conduct a safe and simple investigation to analyze a scientific question.</p> <p>Recognize the role of modeling for understand a scientific problem.</p> <p>Classify objects or ideas based on one or two observable patterns.</p> <p>Identify patterns used in organizing a set of objects or ideas.</p>	<p>Identify variable(s) that should be controlled in an experimental design.</p> <p>Generate a reasonable prediction based on information represented in graphs and charts.</p> <p>Answer questions relative to data in data tables and graphs.</p> <p>Distinguish between fact and opinion when given information.</p> <p>Explain that there can be more than one explanation for a phenomenon.</p> <p>Recognize the importance of accuracy in data collection.</p> <p>Use laboratory equipment safely and appropriately.</p> <p>Develop models to explain scientific phenomenon.</p>	<p>Construct an argument by applying information from different representations of organized data. (N.12.A.1)</p> <p>Evaluate data for precision and accuracy based upon repeated experimentation shared through individual and collaborative work. (N.12.A.2, N.12.A.3)</p> <p>Use a model to explain a cause-effect relationship. (N.12.A.5)</p> <p>Design and then conduct an original scientific investigation. (N.12.A.2, N.12.A.4)</p>	<p>Present data findings and analyses with technological resources. (N.12.A.1, N.12.A.6)</p> <p>Incorporate graphs, charts and data into oral or written presentations (science fair, symposium). (N.12.A.1)</p>

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Content Standard N12B				
Students understand the impacts of science and technology in terms of costs and benefits to society.				
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<p>N.12.B.1 Students know science, technology, and society influenced one another in both positive and negative ways.</p> <p>N.12.B.2 Students know consumption patterns, conservation efforts, and cultural or social practices in countries have varying environmental impacts.</p> <p>N.12.B.3 Students know the influence of ethics on scientific enterprise.</p> <p>N.12.B.4 Students know scientific knowledge builds on previous information.</p>	<p>Recognize that there are costs and benefits associated with technology.</p> <p>Recognize examples of ethical influences on scientific, technological, and societal issues.</p> <p>Recognize that scientific knowledge is constantly changing as scientists investigate and share new information.</p>	<p>List the cost/benefit trade-offs of scientific, technological, and societal issues.</p> <p>Give examples of the effect of technologies on resources.</p> <p>Explain that the body of scientific knowledge changes with the development of new evidence.</p>	<p>Analyze the cost/benefit trade-offs of scientific, technological, and societal issues using scientific evidence. (N.12.B.1, N.12.B.2)</p> <p>Analyze the ethical influences on scientific, technological, and societal issues. (N.12.B.3)</p> <p>Evaluate changes in the body of scientific knowledge based on the development of new evidence. (N.12.B.4)</p>	<p>Debate the costs and benefits of scientific, technological, and societal issues using scientific evidence. (N.12.B.1, N.12.B.2, N.12.B.3, N.12.B.4)</p>
Content Standard P12A				
Students understand that atomic structure explains the properties and behavior of matter				
Content Benchmarks	Work at the Emergent/ Developing level may indicate ability to..	Work at the Approaches level may indicate ability to ...	Work at the Meets level demonstrates ability to...	Work at the Exceeds level demonstrates ability to...
<p>P.12.A.1 Students know different molecular arrangements and motions account for the different physical properties of solids, liquids, and gases.</p> <p>P.12.A.2 Students know elements in the periodic table are arranged into groups and</p>	<p>Describe characteristics of solids, liquids, and gases.</p> <p>Describe common examples of physical changes that occur when matter changes states.</p> <p>Classify matter based on an observable physical or chemical property.</p>	<p>Diagram the arrangement of particles in solids, liquids, and gases.</p> <p>Recognize that all matter is made of tiny particles called atoms.</p> <p>Explain the location, charge, and relative mass of the</p>	<p>Explain different physical properties of solids, liquids, and gases based upon the arrangement and motion of their particles. (P.12.A.1)</p> <p>Describe the properties of different elements according to their arrangements into groups and periods of the periodic</p>	<p>Construct a model or diagram for kinetic-molecular theory and the nature of forces influencing the physical properties of solids, liquids, and gas. (P.12.A.1)</p> <p>Describe the major features of the quantum mechanical model of atomic structure using</p>

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<p>periods by repeating patterns and relationships.</p> <p>P.12.A.3 students know identifiable properties can be used to separate mixtures.</p> <p>P.12.A.4 Students know atoms bond with one another by transferring or sharing electrons.</p> <p>P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e., temperature, concentration, surface area, and agitation).</p> <p>P.12.A.6 Students know chemical reactions either release or absorb energy.</p> <p>P.12.A.7 Students know that in chemical reactions, elements combine in predictable ratios, and the numbers of atoms of each element do not change.</p> <p>P.12.A.8 Students know most elements have two or more isotopes, some of which have practical applications.</p> <p>P.12.A.9 Students know the number of electrons in an atom determines whether the atom is electrically neutral or an ion.</p>	<p>Describe how a mixture of two or more materials can result in a material that may have different properties than the original materials.</p> <p>Explain that the mass of a material remains constant whether it is together, in parts, or in different states.</p> <p>Understand that all materials are made up of smaller parts.</p>	<p>electrons, protons, and neutrons.</p> <p>Explain that elements contain only one type of atom.</p> <p>Recognize properties of different elements by their arrangements into groups and periods of the periodic table.</p> <p>Use the properties of matter to physically separate mixtures.</p> <p>Recognize that different elements combine to form compounds.</p> <p>Recognize that when matter goes through a physical or chemical change, the total mass remains the same.</p> <p>Distinguish between physical and chemical changes.</p>	<p>table. (P.12.A.2)</p> <p>Determine the appropriate physical properties necessary to separate mixtures. (P.12.A.3)</p> <p>Describe chemical bonding in terms of electrons. (P.12.A.4)</p> <p>Explain the qualitative effects of different factors on reaction rates. (P.12.A.5)</p> <p>Recognize that chemical reactions absorb or release energy. (P.12.A.6)</p> <p>Use atomic structure models to classify elements into atoms, ion, and isotopes. (P.12.A.8, P.12.A.9)</p> <p>Balance simple chemical equations from given examples. (P.12.A.7)</p> <p>Identify practical applications of isotopes. (P.12.A.8)</p> <p>Calculate the magnitude and sign of the charge for an ion. (P.12.A.9)</p>	<p>evidence. (P.12.A.2)</p> <p>Write the electronic configuration for neutral atoms and relate it to their reactivity. (P.12.A.2)</p> <p>Describe the theoretical foundation behind chemical bonding using concepts such as electronegativity. (P.12.A.4)</p> <p>Quantitatively describe the ways in which various factors affect the rate of a chemical reaction and influence the direction of equilibrium. (P.12.A.5)</p> <p>Describe the energy involved in a chemical reaction using the concepts of rates of reaction, heats of formation and entropy. (P.12.A.6)</p> <p>Explain how emission and/or absorption spectra are used to identify different substances. (P.12.A.2)</p> <p>Write a balanced chemical equation. (P.12.A.7)</p> <p>Describe applications of radioisotopes in medicine, industry and research. (P.12.A.8)</p>
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Content Standard P12B				
Students understand the interactions between force and motion.				
Content Benchmarks	Work at the Emergent/ Developing level may indicate ability to..	Work at the Approaches level may indicate ability to...	Work at the Meets level demonstrates ability to...	Work at the Exceeds level demonstrates ability to...
<p>P.12.B.1 Students know laws of motion can be used to determine the effects of forces on the motion of objects.</p> <p>P.12.b.2 Students know magnetic forces and electric forces can be thought of as different aspects of electromagnetic force.</p> <p>P.12.B.3 Students know the strength of the electric force between two objects increases with charge and decreases with distance.</p> <p>P.12.B.4 Students know the strength of the gravitational force between two objects increases with mass and decreases rapidly with distance.</p>	<p>Identify that unbalanced forces cause changes in an object's motion.</p> <p>Demonstrate that changes in an object's motion are dependent on its mass and the strength of the unbalanced force applied.</p> <p>Identify materials and objects that can be influenced by magnetic forces.</p> <p>Explain that gravity is the force that pulls any object toward Earth.</p>	<p>Apply the principles of balanced and unbalanced forces to describe the motion of an object.</p> <p>Describe the relationship between electric current and magnetic forces.</p> <p>Explain that gravitational force depends on the relationship between object masses and the distances between them.</p>	<p>Describe the motion of an object using Newton's Laws. (P.12.B.1)</p> <p>Explain that magnetic and electric forces are different aspects of electromagnetic force. (P.12.B.2)</p> <p>Describe the factors that influence the strength of electrical and gravitational forces. (P.12.B.3, P.12.B.4)</p>	<p>Calculate force, acceleration, time and velocity to accurately predict the motion of an object. (P.12.B.1)</p> <p>Quantitatively describe electric forces, magnetic forces and gravitational forces. (P.12.B.3, P.12.B. 4)</p> <p>Experimentally measure aspects of electric forces, magnetic forces and gravitational forces. (P.12.A.3, P.12.B.4)</p>
Content Standard P12C				
Students understand that there are interactions between matter and energy.				
Content Benchmarks	Work at the Emergent/ Developing level may indicate ability to ..	Work at the Approaches level may indicate ability to...	Work at the Meets level demonstrates ability to...	Work at the Exceeds level demonstrates ability to...
<p>P.12.C.1 Students know waves (i.e., sound, seismic, electromagnetic) have energy that can be transferred when the waves interact with matter.</p> <p>P.12.C.2 Students know energy</p>	<p>Identify simple properties of light (e.g., color, brightness, reflection).</p> <p>Define characteristics of sound waves.</p>	<p>Recognize that there are visible and invisible wavelengths of light in the electromagnetic spectrum.</p> <p>Describe the characteristics of a wave: wavelength, frequency,</p>	<p>Use models to demonstrate the transfer of energy from waves to matter. (P.12.C.1)</p> <p>Analyze how energy forms can be converted and transferred for diverse applications. (P.12.C.2)</p>	<p>Experimentally explain the interaction of light with matter using concave and convex lenses. (P.12.C)</p> <p>Use nuclear equations as a model to give examples of</p>

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<p>forms can be converted. P.12.C.3 Students know nuclear reactions convert a relatively small amount of material into a large amount of energy.</p> <p>P.12.C.4 Students know characteristics, applications and impacts of radioactivity.</p> <p>P.12.C.5 Students know the relationship between heat and temperature.</p> <p>P.12.C.6 Students know electricity is transferred from generating sources for consumption and practical uses.</p>	<p>Demonstrate that sound travels through solids, liquids, and gases.</p> <p>Identify examples where heat is produced as a byproduct of energy conversion.</p> <p>Describe examples of heat moving from one object to another.</p> <p>Draw, label or construct a simple electrical circuit containing a battery or generator, wire, an electrical load (e.g., bulb), and a complete loop through which the electrical current can pass.</p>	<p>amplitude and speed.</p> <p>Demonstrate that waves transfer energy differently in different materials.</p> <p>Differentiate between kinetic and potential energy.</p> <p>Explain that in physical, chemical, and nuclear changes energy is transformed.</p> <p>Explain that one form of energy can be changed into another form of energy.</p> <p>Use to examples to describe convection, conduction, and radiation in terms of heat transfer.</p> <p>Demonstrate that a electricity can be used to produce heat, light, sound, motion, and chemical changes.</p> <p>Demonstrate the use of an electrical circuit.</p>	<p>Explain that nuclear reactions convert a relatively small amount of material into a large amount of energy. (P.12.C.3)</p> <p>Compare the release of energy during the nuclear processes of fission and fusion. (P.12.C.3)</p> <p>Identify characteristics of radioactivity. (P.12.C.4)</p> <p>Explain the difference between ionizing and non-ionizing radiation. (P.12.C.4)</p> <p>Evaluate the impacts of radioactivity and its applications. (P.12.C.4)</p> <p>Describe the relationship between heat and temperature. (P.12.C.5)</p> <p>Describe the generation and conduction of electricity. (P.12.C.6)</p>	<p>elements that undergo fission and fusion. (P.12.C.3)</p> <p>Calculate the age of materials using rates of nuclear decay. (P.12.C.4)</p> <p>Explain how conservation of matter and energy apply to chemical reactions and why they do not apply to nuclear reactions. (P.12.C.3)</p> <p>Debate the costs and benefits of key political, economic, scientific and environmental aspects of nuclear power including waste disposal. (N.12.B.1, N.12.B.2)</p>
<p>Content Standard L12A Students understand how genetic information is passed from one generation to another.</p>				
<p>Content Benchmark</p>	<p>Work at the Emergent/ Developing level may indicate ability to..</p>	<p>Work at the Approaches level may indicate ability to...</p>	<p>Work at the Meets level demonstrates ability to...</p>	<p>Work at the Exceeds level demonstrates ability to...</p>
<p>L.12.A.1 Students know genetic information passes from parents to offspring is coded in the DNA molecule.</p>	<p>Explain that genetic information is passed from one generation to another.</p>	<p>Give examples of inherited physical characteristics and behaviors in animals and plants.</p>	<p>Explain the role of DNA in the transfer of genetic information. (L.12.A.1)</p>	<p>Explain how the transfer of genetic information is controlled by DNA. (L.12.A.1)</p>

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<p>L.12.A.2 Students know DNA molecules provide instructions for assembling protein molecules.</p> <p>L.12.A.3 Students know all body cells in a organism develop from a single cell and contain essentially identical instructions.</p> <p>L.12.A.4 Students know several causes and effects of somatic versus sex cell mutations.</p> <p>L.12.A.5 Students know how to predict patterns of inheritance.</p>	<p>Describe that there are different reproductive strategies employed by different organisms.</p> <p>Give examples of how, while offspring resemble their parents and each other, they also exhibit differences in characteristics.</p> <p>Quantify variations among individuals within the human population.</p> <p>Explain the difference between learned and inherited behaviors in animals.</p>	<p>Explain that there are differences between sexual and asexual reproduction.</p> <p>Recognize that ½ the genetic information is contributed by each parent in sexual reproduction.</p> <p>Explain that in sexual reproduction mutations only get passed to the next generation when they occur in sex cells.</p> <p>Give examples of selective breeding.</p> <p>Distinguish between inherited and environmentally influenced traits.</p>	<p>Explain that DNA is the template to assemble proteins. (L.12.A.2)</p> <p>Explain that somatic cells originate from a single cell and each contains essentially identical genetic instructions. (L.12.A.3)</p> <p>Explain that sex cells originate from a single cell and each contains ½ of the genetic material of the parent cell. (L.12.A.3)</p> <p>Describe causes and effects of somatic cell mutations and of sex cell mutations. (L.12.A.4)</p> <p>Predict patterns of inheritance. (L.12.A.5)</p>	<p>Construct and justify the double helix model of DNA using base pairing, hydrogen bonding, and phosphate groups. (L.12.A.2)</p> <p>Explain the process of protein synthesis, including translation and transcription. (L.12.A.2)</p> <p>Construct a diagram of the process of mitosis as part of the cell cycle. (L.12.A.1, L.12.A.3)</p> <p>Generate several examples of influences that may lead to somatic mutations and sex cell mutations. (L.12.A.4)</p> <p>Evaluate genetic combinations for evidence of independent assortment and recombination of genes. (L.12.A.5)</p> <p>Investigate advances in biotechnology using multiple resources. (N.12.B.4)</p>
<p>Content Standard L12B Students understand that all life forms, at all levels of organization, use specialized structures and similar processes to meet life's needs.</p>				
<p>Content Benchmarks</p>	<p>Work at the Emergent/ Developing level may indicate ability to ..</p>	<p>Work at the Approaches level may indicate ability to...</p>	<p>Work at the Meets level demonstrates ability to...</p>	<p>Work at the Exceeds level demonstrates ability to...</p>
<p>L.12.B.1 Students know cell structures and their functions.</p> <p>L.12.B.2 Students know the human body has a specialized</p>	<p>Match structures in plants and animals to their functions.</p> <p>Sequence the life cycle stages of plants or animals.</p>	<p>Explain that all organisms are composed of one or more cells.</p> <p>Recognize that components of a cell replicate before a cell</p>	<p>Explain the relationship between cell functions and major cell structures. (L.12.B.1)</p> <p>Explain how the organelles of a</p>	<p>Differentiate structure and function of cellular components using diagrams of plant or animal cells. (L.12.B.1)</p>

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<p>anatomy and physiology composed of an hierarchical arrangement of differentiated cells.</p> <p>L.12.B.3 Students know disease disrupts the equilibrium that exists in a healthy organism.</p>		<p>divide.</p> <p>Explain that cells have specialized components that perform specific functions.</p> <p>Describe that cells take in nutrients that provide energy for cell functions.</p> <p>Explain that tissues are composed of cells working together.</p> <p>Explain that organs are composed of tissues which work together.</p> <p>Explain that organ systems consist of organs working together.</p> <p>Explain that diseases occur when there is breakdown in the structure or function of a body system.</p>	<p>cell function as a system. (L.12.B.1)</p> <p>Discuss the levels of organization specialized to the human anatomy. (L.12.B.2)</p> <p>Recognize that human tissues include bone, blood, nerve, muscle, and skin. (L.12.B.2)</p> <p>Describe the different organ systems in the human body. (L.12.B.2)</p> <p>Evaluate how a disease disrupts the homeostasis of an organism. (L.12.B.3)</p>	<p>Compare and contrast the different organ systems in the human body using structure and function. (L.12.B.2)</p> <p>Identify disruptions to homeostasis using case study evidence. (L.12.B.3)</p>
<p>Content Standard L12C</p> <p>Students understand that ecosystems display patterns of organization, change, and stability as a result of the interactions and interdependencies among the living and non-living components of the Earth.</p>				
<p>Content Benchmarks</p>	<p>Work at the Emergent/ Developing level may indicate ability to ..</p>	<p>Work at the Approaches level may indicate ability to...</p>	<p>Work at the Meets level demonstrates ability to...</p>	<p>Work at the Exceeds level demonstrates ability to...</p>
<p>L.12.C.1 Students know relationships of organisms and their physical environments.</p> <p>L.12.C.2 Students know how changes in an ecosystem can</p>	<p>Draw and label a simple food web.</p> <p>Explain how a given organism interacts with biotic and abiotic parts of its ecosystem.</p>	<p>Diagram the transfer of matter and energy in a food web.</p> <p>Describe the function of, and relationships among producers, consumers, and decomposers.</p>	<p>Analyze the relationships between organisms and their physical environment. (L.12.C.1)</p> <p>Explain how changes in an</p>	<p>Construct a model of a biogeochemical cycle as a system. (L.12.C.1)</p> <p>Describe the factors necessary for organisms to survive and</p>

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<p>affect biodiversity and biodiversity's contribution to an ecosystem's stability.</p> <p>L.12.C.3 Students know the amount of living matter an environment can support is limited by the availability of matter, energy, and the ability of the ecosystem to recycle materials.</p> <p>L.12.C.4 Students know the unique geologic, hydrologic, climatic, and biological characteristics of Nevada's bioregions.</p>	<p>Identify changes in the environment that are beneficial or detrimental.</p> <p>Give examples of an organism causing change in the environment.</p> <p>Identify common adaptations that allow organisms to survive in specific ecosystems.</p>	<p>Predict the beneficial and harmful results of a change in the environment.</p> <p>Relate factors such as climate, to the types of organisms found in an environment.</p> <p>Use examples to explain that ecosystems have limited resources that affect the number and type of organisms that can survive.</p>	<p>ecosystem can affect biodiversity and biodiversity's contribution to an ecosystem's stability. (L.12.C.2)</p> <p>Evaluate how the amount of living matter an environment can support is limited by the availability of matter, energy, and the ability of the ecosystem to recycle materials. (L.12.C.3)</p> <p>Describe the unique geologic, hydrologic, climatic, and biological characteristics of Nevada's bioregions. (L.12.C.4)</p>	<p>interact with their physical environment. (L.12.C.2)</p> <p>Explain responses to environmental change that enhance or reduce the chances of survival among organisms using examples. (L.12.C.2, L.12.C.3)</p> <p>Use a model to explain the limitations on the amount of living matter in an environment. (L.12.C.3)</p> <p>Compare and contrast all of Nevada's bioregions, showing the unique geologic, hydrologic, climatic, and biological characteristics. (L.12.C.4)</p>
<p>Content Standard L12D Students understand biological evolution and diversity of life.</p>				
<p>Content Standard</p>	<p>Work at the Emergent/ Developing level may indicate ability to ..</p>	<p>Work at the Approaches level may indicate ability to...</p>	<p>Work at the Meets level demonstrates ability to...</p>	<p>Work at the Exceeds level demonstrates ability to...</p>
<p>L.12.D.1 Students know organisms can be classified based on evolutionary relationships.</p> <p>L.12.D.2 Students know similarity of DNA sequences give evidence of relationships between organisms.</p> <p>L.12.D.3 Students know the fossil record gives evidence for natural selection and its</p>	<p>Classify animals and plants based on observable characteristics.</p> <p>Explain that fossils are evidence of past life.</p> <p>Contrast the differences among individuals within a species that give them advantages and/or disadvantages in surviving and reproducing.</p>	<p>Sort organisms into species.</p> <p>Infer changes in organisms and environmental conditions based on fossil evidence.</p> <p>Explain that organisms have passed useful changes to offspring over long periods of time.</p> <p>Differentiate between learned and inherited behaviors.</p>	<p>Classify organisms using evolutionary relationships, including DNA evidence. (L.12.D.1, L.12.D.2)</p> <p>Explain natural selection and its evolutionary consequences using the fossil record as evidence. (L.12.D.3)</p> <p>Explain diversity of life and extinction of species using the model of biological evolution,</p>	<p>Defend the practice of using similarities in DNA sequence to classify organisms. (L.12.D.1, L.12.D.2)</p> <p>Generate examples from the fossil record that provide evidence for evolution.(L.12.D.3)</p> <p>Use examples to illustrate how evolution explains the diversity of life and extinction of species.</p>

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<p>evolutionary consequences. L.12.D.4 Students know the extinction of species can be a natural process.</p> <p>L.12.D.5 Students know biological evolution explains diversity of life.</p> <p>L.12.D.6 Students know concepts of natural and artificial selection.</p>		<p>Identify adaptation(s) that allow species to thrive and reproduce.</p>	<p>including both natural selection and genetic mutations. (L.12.D.4, L.12.D.5)</p> <p>Use examples to explain the concepts of natural and artificial selection. (L.12.D.6)</p>	<p>(L.12.D.4, L.12.D.5)</p> <p>Explain how artificial selection was an underlying concept to Charles Darwin's theory of evolution and natural selection. (L.12.D.6)</p>
<p>Content Standard E12A Students understand that heat and energy transfer in and out of the atmosphere and influence weather and climate.</p>				
<p>Content Benchmark</p>	<p>Work at the Emergent/ Developing level may indicate ability to ..</p>	<p>Work at the Approaches level may indicate ability to...</p>	<p>Work at the Meets level demonstrates ability to...</p>	<p>Work at the Exceeds level demonstrates ability to...</p>
<p>E.12.A.1 Student's know the Sun is the major source of Earth's energy, and provides the energy driving Earth's weather and climate.</p> <p>E.12.A.2 Student's know the composition of Earth's atmosphere has changed in the past and is changing today.</p> <p>E.12.A.3 Students understand the role of the atmosphere in Earth's greenhouse effect.</p> <p>E.12.A.4 Students know convection and radiation play important roles in moving heat energy in the Earth system.</p> <p>E.12.A.5 Students know Earth's rotation affects winds and ocean</p>	<p>Explain that the Sun is the major source of energy for Earth.</p> <p>Explain the processes (evaporation, condensation, and precipitation), including the role of the Sun, in the water cycle.</p> <p>Describe water's role in many weather phenomena.</p> <p>Describe the atmosphere as a relatively thin layer of gas surrounding Earth.</p>	<p>Explain the seasons are caused by the variations in the Sun's energy reaching Earth due to the planet's axial tilt.</p> <p>Distinguish between the characteristics of weather and the characteristics of climate.</p> <p>Describe how the water cycle affects climate.</p> <p>Identify the properties that make water an essential component on Earth.</p> <p>Explain that energy transfers drive Earth's water cycle.</p> <p>Describe that the Earth's atmosphere contains gases and particulate matter, and is mostly</p>	<p>Explain the Sun's impact as a major source of energy driving Earth's weather and climate. (E.12.A.1)</p> <p>Describe how the composition of Earth's atmosphere has changed in the past and is changing today. (E.12.A.2)</p> <p>Explain the greenhouse effect. (E.12.A.3)</p> <p>Use models to explain how convection and radiation transfer energy in Earth's atmosphere. (E.12.A.4)</p> <p>Explain how Earth's rotation affects winds and ocean currents. (E.12.A.5)</p>	<p>Compare and contrast the major influences on Earth's weather and climate. (E.12.A.1)</p> <p>Debate the social, economic and environmental impacts of the current theories of global warming. (N.12.B.1)</p> <p>Create a model of how the greenhouse effect impacts convection and radiation in Earth's atmosphere. (E.12.A.3)</p>

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currents.		<p>composed of nitrogen and oxygen.</p> <p>Explain that most weather takes place in the part of the atmosphere closest to the Earth.</p> <p>Describe the rain shadow effect on Nevada's weather and climate.</p> <p>Describe how topography affects weather patterns.</p>		
Content Standard E12B				
Students know scientific theories of origins and evolution of the universe.				
Content Benchmarks	Work at the Emergent/ Developing level may indicate ability to..	Work at the Approaches level may indicate ability to...	Work at the Meets level demonstrates ability to...	Work at the Exceeds level demonstrates ability to...
<p>E.12.B.1 Students know common characteristics of stars.</p> <p>E.12.B.2 students know stars are powered by nuclear fusion of lighter elements into heavier elements, which results in the release of large amounts of energy.</p> <p>E.12.B.3 Students know ways in which technology has increased understanding of the universe.</p> <p>E.12.B.4 Students know the on-going processes involved in star formation and destruction.</p> <p>E.12.B.5 Students know</p>	<p>Describe that stars have different colors and brightness.</p> <p>Explain that the Sun is the center of a system that contains planets and moons, which move around the Sun.</p> <p>Record the cyclical patterns of the Sun and Moon.</p> <p>Recognize how a given pattern of stars does not change, although it may appear in different parts of the sky in different seasons.</p>	<p>Compare the mass, brightness, and color of the Sun to other stars.</p> <p>Recognize that the universe contains many galaxies, each containing billions of stars.</p> <p>Model our Solar System.</p> <p>Compare the characteristics of planets in our Solar System.</p> <p>Model the relative distances between the Sun and Earth, as well as, the Sun and other stars.</p> <p>Describe that our Solar System is a part of the Milky Way Galaxy.</p>	<p>Describe the common characteristics of stars. (E.12.B.1)</p> <p>Recognize that nuclear fusion of lighter elements into heavier elements in stellar cores results in all of the star's energy. (E.12.B.2)</p> <p>Describe how new technologies have refined models of the origins and evolution of the universe. (E.12.B.3)</p> <p>Describe the ongoing processes involved in stellar evolution. (E.12.B.4)</p> <p>Explain that current scientific</p>	<p>Explain how scientists use the Laws of Motion qualitatively and quantitatively to investigate the universe. (E.12.B)</p> <p>Use multiple resources to compare and contrast Earth's environment to other planets, and objects in the universe. (E.12.B)</p> <p>Explain the evidence for the theory of an expanding universe. (E.12.B.5)</p>

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scientific evidence suggests that the universe is expanding.		Describe how days, year, phases of the moon, and eclipses occur.	evidence suggests that the universe is expanding. (E.12.B.5)	
Content Standard E12C				
Students understand evidence for processes that take place on a geologic time scale.				
Content Benchmarks	Work at the Emergent/ Developing level may indicate ability to ..	Work at the Approaches level may indicate ability to...	Work at the Meets level demonstrates ability to...	Work at the Exceeds level demonstrates ability to...
E.12.C.1 Students know how successive rock strata and fossils can be used to confirm the age, history, and changing life forms of the Earth, including how this evidence is affected by the folding, breaking, and uplifting of layers. E.12.C.2 Students understand the concept of plate tectonics including the evidence that supports it (structural, geophysical and paleontological evidence). E.12.C.3 Students know elements exist in fixed amounts and move through solid earth, oceans, atmosphere and living things as part of biogeochemical cycles. E.12.C.4 Students know processes of obtaining, using, and recycling of renewable and non-renewable resources.	Describe that fossils are evidence of past life. Describe how water, wind, and ice constantly change the Earth's land surface. Describe changes in land forms that result from both slow and fast geologic processes. Explain that rock is composed of different combinations of minerals. Describe the components of soil and how it varies from place to place.	Discuss how fossils and sedimentary rocks provide evidence for changing environments. Diagram the rock cycle. Diagram the structure of the earth including the continental and oceanic crust, hot convecting mantle, and metallic core. Model geological events that result from large crustal plate movements. Contrast the various geological processes that shape Nevada regions. Classify minerals according to their properties. Recognize that minerals are unevenly distributed throughout the Earth's crust according to how they form.	Quantify the age, history, and changing life forms of Earth using strata and fossil evidence. (E.12.C.1) Describe how folding, breaking, and uplifting of strata complicate geological evidence. (E.12.C.1) Use evidence to model plate tectonics. (E.12.C.2) Describe biogeochemical cycles. (E.12.C.3) Describe processes for obtaining, using, and recycling renewable and nonrenewable resources. (E.12.C.4) Explain that soil is found in layers and is a product of weathering and of the decomposition of organic material. (E.12.C.5)	Infer geologic history through examination of representations of rock sequences. (E.12.C.1) Predict the movement of a lithospheric plate using experimental data. (E.12.C.2) Evaluate the probable effects of a disruption of any portion of the biogeochemical cycles on the rest of the cycles. (E.12.C.3) Prioritize emergent processes in obtaining, using, and recycling renewable and nonrenewable resources with regards to societal, economic and environmental factors. (N.12.C.2) Describe the probable formation of a soil sample given its properties and composition. (E.12.C.5)

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<p>E.12.C.5 Students know soils, derived from weathered rocks and decomposed organic material, is found in layers.</p>		<p>Identify characteristics, abundances and locations of renewable and nonrenewable resources in Nevada.</p> <p>Identify properties of soils such as color, texture, and water retention.</p> <p>Explain how soils are formed through weathering and decomposition.</p> <p>Explain that soils provide nutrients for life.</p>		
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