Biology

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
N.12	Nature of Science		
0	Scientific inquiry is the process by which humans systematically examine the natural world. Scientific inquiry is a human endeavor and involves observation, reasoning, insight, energy, skill, and creativity. Scientific inquiry is used to formulate and test explanations of nature through observation, experiments, and theoretical or mathematical models. Scientific explanations and evidence are constantly reviewed and examined by others. Questioning, response to criticism and open communication are integral to the process of science.	SEM A/UNIT 1/Section 2/part 2	Science and the Scientific Method
N.12.A	Students understand that a variety of communication methods can be used to share scientific information.		
0	Using Data		
N.12.A.1	Students know tables, charts, illustrations and graphs can be used in making arguments and claims in oral and written presentations.	SEM A/UNIT 1 Lab	Lab 1, the salt boiling experiment has students gather data and construct a graph.
0	Record-keeping	Throughout the course students will keep an online lab notebook.	Throughout the course students will keep an online lab notebook.
N.12.A.2	Students know scientists maintain a permanent record of procedures, data, analyses, decisions, and understandings of scientific investigations.	Throughout the course students will keep an online lab notebook.	Throughout the course students will keep an online lab notebook.
0	Accuracy		
N.12.A.3	Students know repeated experimentation allows for statistical analysis and unbiased conclusions.		

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0	Safe Experimentation		
N.12.A.4	Students know how to safely conduct an original scientific investigation using the appropriate tools and technology.		
0	Models		
N.12.A.5	Students know models and modeling can be used to identify and predict cause-effect relationships.		
N.12.A.6	Students know organizational schema can be used to represent and describe relationships of sets.	SEM A/UNIT 1/Section 1/Part 5	Students will do an online activity about the characteristics of life; they will also do some classification during SEM B
0	Technology defines a society or era. It can shape the environment in which people live, and it has increasingly become a larger part of people's lives. While many of technology's effects on society are regarded as desirable, other effects are seen as less desirable. These concepts are shared across subject areas such as science, math, technology, social studies and language arts. The development and use of technology affects society and the environment in which we live, and, at the same time, society influences the development of technology and its impact on culture.		

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N.12.B	Students understand the impacts of science and technology in terms of costs and benefits to society.		
0	Risks and Benefits		
N.12.B.1	Students know science, technology, and society influenced one another in both positive and negative ways.		
0	Ethical Behavior		
N.12.B.2	Students know consumption patterns, conservation efforts, and cultural or social practices in countries have varying environmental impacts.		
N.12.B.3	Students know the influence of ethics on scientific enterprise.		
0	Collaboration		
N.12.B.4	Students know scientific knowledge builds on previous information.		

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P.12	Physical Science		
0	Matter has various states with unique properties that can be used as a basis for organization. The relationship between the properties of matter and its structure is an essential component of study in the physical sciences. The understanding of matter and its properties leads to practical applications, such as the capability to liberate elements from ore, create new drugs, manipulate the structure of genes and synthesize polymers.		
P.12.A	Students understand that atomic structure explains the properties and behavior of matter.	SEM A/UNIT 1/section 2/part 2	This part details atomic structure and subatomic particles.
0	Properties of Matter		
P.12.A.1	Students know different molecular arrangements and motions account for the different physical properties of solids, liquids, and gases.		
P.12.A.2	Students know elements in the periodic table are arranged into groups and periods by repeating patterns and relationships.		
0	Mixtures and Compounds		

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P.12.A.3	Students know identifiable properties can be used to separate mixtures.		
P.12.A.4	Students know atoms bond with one another by transferring or sharing electrons.	SEM A/UNIT 1/section 2/part 2	This section details the three types of atomic bonds or interactions that are significant to biological molecules
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.12.A.6	Students know chemical reactions either release or absorb energy.	SEM A/UNIT 2/section 1/part 1	Text and graphics illustrate this point.
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.	SEM A/UNIT 2/section 1/part 1	Text and graphics illustrate this point.
0	Atomic Structure		
P.12.A.8	Students know most elements have two or more isotopes, some of which have practical applications.		
P.12.A.9	Students know the number of electrons in an atom determines whether the atom is electrically neutral or an ion.	SEM A/UNIT 1/section 2/part 1	Text and graphics illustrate this point.

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0	The laws of motion are used to describe the effects of forces on the movement of objects.		
P.12.B	Students understand the interactions between force and motion.		
0	Motion		
P.12.B.1	Students know laws of motion can be used to determine the effects of forces on the motion of objects.		
0	Forces		
P.12.B.2	Students know magnetic forces and electric forces can be thought of as different aspects of electromagnetic force.		
P.12.B.3	Students know the strength of the electric force between two objects increases with charge and decreases with distance.		
P.12.B.4	Students know the strength of the gravitational force between two objects increases with mass and decreases rapidly with distance.		

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0	The total energy of the universe is constant. All events involve the transfer of energy in one form or another. In all energy transfers, the overall effect is that the energy is spread out uniformly.		
P.12.C	Students understand that there are interactions between matter and energy.	SEM A/UNIT 2/Introduction, section 1/part 1	Online lab exploring photosynthesis
0	Waves		
P.12.C.1	Students know waves (I.e. sound, seismic, electromagnetic) have energy that can be transferred when the waves interact with matter.		
0	Forms and Uses of Energy		
P.12.C.2	Students know energy forms can be converted.	SEM A/UNIT 2/Introduction, section 1/part 1	Drag and Drop activity
P.12.C.3	Students know nuclear reactions convert a relatively small amount of material into a large amount of energy.		
P.12.C.4	Students know characteristics, applications and impacts of radioactivity.		

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P.12.C.5	Students know the relationship between heat and temperature.		
0	Electricity		
P.12.C.6	Students know electricity is transferred from generating sources for consumption and practical uses.		
E.12	Earth and Space Science		
0	Earth systems have internal and external sources of energy, both of which create heat. Driven by sunlight and Earth's internal heat, a variety of cycles connect and continually circulate energy and material through the components of the earth systems.		
E.12.A	Students understand heat and energy transfer in and out of the atmosphere and influence weather and climate.		
0	Sun's Energy		
E.12.A.1	Students know the Sun is the major source of Earth's energy, and provides the energy driving Earth's weather and climate.		

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0	Weather		
E.12.A.2	Students know the composition of Earth's atmosphere has changed in the past and is changing today.		
E.12.A.3	Students understand the role of the atmosphere in Earth's greenhouse effect.		
E.12.A.4	Students know convection and radiation play important roles in moving heat energy in the Earth system.		
E.12.A.5	Students know Earth's rotation affects winds and ocean currents.		
0	The universe is a dynamic system of matter and energy. The universe is extremely large and massive with its components separated by vast distances. Tools of technology will continue to aid in the investigation of the components, origins, processes and age of the universe. Earth is one part in our solar system, which is within the Milky Way galaxy. The Sun is the energy-producing star for our solar system. Most objects in our solar system are in predictable motion, resulting in phenomena such as day/night, year, phases of the moon, tides, and eclipses.		

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E.12.B	Students know scientific theories of origins and evolution of the universe.		
0	Components of the Universe		
E.12.B.1	Students know common characteristics of stars.		
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.		
E.12.B.3	Students know ways in which technology has increased understanding of the universe.		
0	Formation of Universe		
E.12.B.4	Students know the on-going processes involved in star formation and destruction.		
E.12.B.5	Students know scientific evidence suggest that the universe is expanding.		

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0	Celestial Motion		
E.8.B.7	Students know regular and predictable motions of Earth around the Sun and the Moon around the Earth explain such phenomena as the day, the year, phases of the Moon, and eclipses.		
0	Earth is composed of materials that move through the biogeochemical cycles. Earth's features are shaped by ongoing and dynamic processes. These processes can be constructive or destructive and occur over geologic time scales.		
E.12.C	Students understand evidence for processes that take place on a geologic time scale.		
0	Geologic Processes		
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.		
0	Plate Tectonics		
E.12.C.2	Students understand the concept of plate tectonics including the evidence that supports it (structural, geophysical and paleontological evidence).		

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0	Earth's Composition and Resources		
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	Student know processes of obtaining, using, and recycling of renewable and non-renewable resources.		
E.12.C.5	Students know soil, derived from weathered rocks and decomposed organic material, is found in layers.		
L.12	Life Science		
0	Heredity is the genetic passing of a set of instructions from generation to generation. These instructions are encoded as DNA and may manifest themselves as characteristics. Some characteristics are inherited, and some result from interactions with the environment.	SEM A/UNIT 4/ section 1 and 2	
L.12.A	Students understand how genetic information is passed from one generation to another.	SEM A/UNIT 4/ section 1 and 2	
0	DNA	SEM A/UNIT 4/ section 4	Multimedia DNA Introduction

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L.12.A.1	Students know genetic information passed from parents to offspring is coded in the DNA molecule.	SEM A/UNIT 4/ section 4	
L.12.A.2	Students know DNA molecules provide instructions for assembling protein molecules.	SEM A/UNIT 4/ section 4	
L.12.A.3	Students know all body cells in an organism develop from a single cell and contain essentially identical genetic instructions.	SEM A/UNIT 3/ section 3	
0	Predicting		
L.12.A.4	Students know several causes and effects of somatic versus sex cell mutations.		
L.12.A.5	Students know how to predict patterns of inheritance.	SEM A/UNIT 4/ section 1 and 2	
0	All living things are composed of cells. Cells range from very simple to very complex and have structures which perform functions for the organism. Cells and structures can be damaged or fail because of intrinsic failures or disease.	SEM A/UNIT 4/ section 3	
L.12.B	Students understand that all life forms, at all levels of organization, use specialized structure and similar processes to meet life's needs.	SEM A/UNIT 3/ section 1/part 5	

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0	Cells		
L.12.B.1	Students know cell structures and their functions.	SEM A/UNIT 3/ section 1/part 5	
L.12.B.2	Students know the human body has a specialized anatomy and physiology composed of an hierarchical arrangement of differentiated cells.		
0	Disease		
L.12.B.3	Students know disease disrupts the equilibrium that exists in a healthy organism.		
0	A variety of ecosystems and communities exist on Earth. Ecosystems are dynamic interactions of organisms and their environment. Ecosystems have distinct characteristics and components that allow certain organisms to thrive. Change in one or more components can affect the entire ecosystem.	SEM B/UNIT 5/ section 2/part 1	Multimedia presentation on earth's biomes parts 2 and 3 explore earth's biomes using ytext as well as images.
L.12.C	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.	SEM B/UNIT 5/ section 2/part 4 and 5	
0	Cycles		

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L.12.C.1	Students know relationships of organisms and their physical environment	SEM B/UNIT 5/ section 3/part 1	This section also covers biogeochemical cyucles such as carbon and phosphorous as well as water.
0	Ecosystems		
L.12.C.2	Students know how changes in an ecosystem can affect biodiversity and biodiversity's contribution to an ecosystem's stability.	SEM B/UNIT 5/ section 3/part 1	
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.	SEM B/UNIT 5/ section 2/part 5	
L.12.C.4	Students know the unique geologic, hydrologic, climatic, and biological characteristics of Nevada's bioregions.		
0	Evidence suggests that living things change over periods of time. These changes can be attributed to genetic and/or environmental influences. This process of change over time is called biological evolution. The diversity of life on Earth is classified using objective characteristics. Scientific classification uses a hierarchy of groups and subgroups based on similarities that reflect evolutionary relationships.	SEM A/UNIT 5/ section 1/part 3 and 4	
L.12.D	Students understand biological evolution and diversity of life.	SEM B/UNIT 2/ and SEM A Unit 5	

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0	Evolution		
L.12.D.1	Students know organisms can be classified based on evolutionary relationships.		
L.12.D.2	Students know similarity of DNA sequences gives evidence of relationships between organisms.	SEM A/UNIT 5/ section 1/part 6	
0	Natural Selection		
L.12.D.3	Students know the fossil record gives evidence for natural selection and its evolutionary consequences.	SEM A/UNIT 5/ section 1/part 4	
L.12.D.4	Students know the extinction of species can be a natural process.	SEM B/Unit 5 as well as Unit 1	
L.12.D.5	Students know biological evolution explains diversity of life.	SEM A/Unit 5 and SEM B Unit 2	
L.12.D.6	Students know the concepts of natural and artificial selection.	SEM A/Unit 5	