

Wyoming Department of Education Required Virtual Education Course Syllabus

Lincoln County School District # 2

Program Name:	Star Valley Virtual School	Content Area:	SC
Course ID:	SCBIO2050A	Grade Level:	9th - 12th
Course Name:	Biology A	# of Credits:	0.5
SCED Code:	03051G0.5011	Curriculum Type:	District Developed

COURSE DESCRIPTION

Biology is a course that will provide students with an understanding of the structure, function and classification of unicellular and multicellular organisms and their interrelationships with their environment. The students will enhance their understanding of various concepts by participating in science laboratory activities. Since scientific events have had significant impacts on our cultural heritage, what students learn will enrich their lives and better prepare them to be contributing and thinking citizens.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
HS-LS1-1	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized
HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multi-cellular organisms.
HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
HS-LS1-5	Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.
HS-LS1-6	Construct explanations and revise, as needed, based on evidence for: 1) how carbon, hydrogen, and oxygen may combine with other elements to form amino acids and/or other large carbon-based molecules, and 2) how other hydrocarbons may also combine to form large carbon-based
HS-LS1-7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of sugar molecules are broken and the bonds in new compounds are formed resulting in a net transfer of
HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
HS-LS2-3	Construct an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions, and revise as needed.
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
HS-LS2-5	Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

HS-LS2-6	Evaluate the claims, evidence, and reasoning that the complex biotic and abiotic interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions,
HS-LS2-7	Evaluate and assess impacts on the environment and biodiversity in order to refine or design a solution for detrimental impacts or enhancement for positive impacts.
HS-LS2-8	Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.
HS-LS3-1	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
HS-LS3-2	Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and /or
HS-LS4-6	Create and/or use a simulation to evaluate the impacts of human activity on biodiversity.

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
UNIT 1: What is Biology? Structure and Function	HS-LS1-1 HS-LS1-2 HS-LS1-3 HS-LS1-6	<p>Students will be able to: test the properties of water and relate those properties to function of life in both plants and animals.</p> <p>Students will be able to: test the pH of different substances and explain the relationship between acids, bases and neutral substances and their specific effects on living organisms.</p> <p>Students will be able to: identify and classify macromolecules and relate them to the proper functioning of living systems including the big idea of DNA coding for the proper amino acid sequence and proteins.</p> <p>Students will be able to: organize and classify life in order of complexity.</p> <p>Students will be able to: evaluate cells based on their structural components and organelles.</p> <p>Students will be able to: describe and give examples of feedback loops found in living organisms.</p>

UNIT 2: Ecosystems and Energy Flow	HS-LS1-5 HS-LS1-7 HS-LS2-3 HS-LS2-4 HS-LS2-5	<p>Students will be able to: trace the flow of energy and matter through food and energy chains, webs and pyramids.</p> <p>Students will be able to: identify the parts of the plant cell that create energy using sunlight and explain how the plants convert sunlight to usable energy.</p> <p>Students will be able to: construct an explanation of how chemical energy stored in plants is converted to cellular energy in animals by mapping the process to the cellular components involved, and cellular respiration.</p> <p>Students will be able to: trace the flow of energy and molecules through the ecosystem.</p>
UNIT 3: Ecosystems, Communities and Populations	HS-LS2-1 HS-LS2-2 HS-LS2-6 HS-LS2-7 HS-LS2-8 HS-LS4-6	<p>Students will be able to: model the effects of organisms on an ecosystem and determine that specific ecosystem's carrying capacity.</p> <p>Students will be able to: Identify and give examples of the different types of ecological succession.</p> <p>Students will be able to: graph data demonstrating a population and how it changes over time due to natural circumstances.</p> <p>Students will be able to: evaluate and graph human population patterns based on birthrates and resources available.</p> <p>Students will be able to: explain what biodiversity is and why it is important to all organisms on earth.</p>
UNIT 4: Cell Division	HS-LS1-1 HS-LS1-4 HS-LS3-1 HS-LS3-2	<p>Students will be able to: model how cells divide through the process of mitosis by observing and identifying stages of the cell cycle in both a digital cell division lab and a microscope lab.</p> <p>Students will be able to: compare and contrast the process and the products of the cell cycle with meiosis and the division of sex cells.</p> <p>Students will be able to: explain that DNA is separated randomly during DNA thus ensuring a greater biodiversity.</p>