

Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Science
Course ID	CASC62421	Grade Level	6
Course Name	Science 6 B	# of Credits	0.5
SCED Code	NoCourseSCED	Curriculum Type	Connections Academy

COURSE DESCRIPTION

Welcome to Science 6, an innovative course based on the framework for the Next Generation Science standards (NGSS). NGSS focuses on science and engineering practices; Earth, life and physical science core ideas; and fundamental crosscutting concepts vital to relating the various fields of science and developing a scientific world view. The course provides the student opportunities to engage in inquiry-based investigations, STEM (Science Technology Engineering Mathematics) projects, and other dynamic activities. Hands-on and online activities encourage the student to make connections, collaborate, and reflect on his or her learning. Because the course is designed to meet both national and state-based standards, the sequence of content will vary by state.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.
MS-PS1-2	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
MS-PS1-3	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
MS-PS1-5	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
MS-PS2-1	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
MS-PS2-2	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
MS-PS2-3	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
MS-PS2-4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
MS-PS2-5	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
MS-PS3-1	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
MS-PS3-2	Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
MS-PS3-4	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
MS-LS1-7	Develop a model to describe how food molecules (sugar) are rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
MS-LS1-8	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.
MS-LS2-1	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
MS-LS3-1	Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
MS-LS3-2	Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

MS-LS4-1	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
MS-LS4-5	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.
MS-ESS1-1	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
MS-ESS1-2	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
MS-ESS2-1	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
MS-ESS2-3	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
MS-ESS2-4	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
MS-ESS2-5	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
MS-ESS2-6	Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
MS-ESS3-2	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
MS-ESS3-3	Apply scientific principles to design a method for monitoring, evaluating, and managing a human impact on the environment.
MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused changes in global temperatures over time.
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
MS-ETS1-4	Develop a model for a proposed object, tool or process and then use an iterative process to test the model, collect data, and generate modification ideas trending toward an optimal design.

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES
<p>Unit 1: Reproduction and Development of Organisms</p> <p>In this unit, you will explore, describe, discuss and investigate the reproduction and development of organisms as you engage in hands-on and virtual activities. You will compare types of reproduction, explore how plants use animals to help them reproduce, and discuss the roles of environment and genetics in the development and growth of organisms.</p>	MS-LS3-2, MS-LS4-5	<ul style="list-style-type: none"> •Discuss how the growth of organisms is affected by environmental and genetic factors •Demonstrate that plants use photosynthesis to grow throughout their lives •Plan and conduct investigations into how animal behaviors and plant structures affect the successful reproduction of the plant •Analyze empirical evidence that explains how the chance of successful reproduction depends on animal behaviors •Communicate ways that technology makes it possible to influence the inheritance of traits

<p>Unit 2: Introduction to Planet Earth</p> <p>In this unit, you will gain an understanding of why Earth can be described as a system with four main parts, and you will explore some of Earth's properties that make it suitable for life. You will study Earth's atmosphere and learn how temperatures on Earth are just right for various life forms. By studying Earth's rotation and its revolution, you will learn what causes day and night and why there are seasonal cycles on the "blue planet." By the end of the unit, you will also be able to describe characteristics of Earth's moon, list the phases of the moon, and explain why the moon goes through phases. This unit will give you an introductory look at Earth and its place in the solar system, and it will prepare you for upcoming units in astronomy and space science.</p>	<p>MS-PS2-2, MS-PS2-4, MS-ESS1-1, MS-ESS1-2, MS-ESS1-3, MS-ETS1-4</p>	<ul style="list-style-type: none"> •Identify and describe the four main components of the Earth system and explain the properties of Earth that support life •Define rotation and revolution and explain why day and night and seasons occur •Identify what determines the strength of the force of gravity between two objects and describe what factors keep the moon and Earth in orbit •Describe the features and characteristics of the moon and explain why the moon has phases and the effect the sun and the moon have on tides •Define the term eclipse and explain when solar and lunar eclipses occur
<p>Unit 3: Our Solar System</p> <p>In this unit, you will study the solar system and how it is made up of the sun, the planets, their moons, and a variety of smaller objects, including asteroids, comets, and meteors. You will learn about the sun's surface features as well as its interior and its atmosphere and how the sun fits into the universe. You will study both the inner planets and outer planets and will be able to describe the unique characteristics that distinguish each planet. You will learn about the similarities and differences between small bodies in the solar system, including asteroids, meteors, and comets, and you will study the life cycle of stars and learn how stars are classified. By the end of the unit, you will be able to identify major types of galaxies and explain the big bang theory. You will also be able to describe pieces of evidence that indicate that the universe is expanding, and you will be able to discuss how space technology has benefitted people.</p>	<p>MS-ESS2-1, MS-ESS1-3, MS-ESS3-2, MS-LS4-1, MS-PS1-2, MS-ETS1-3, MS-ESS2-3, MS-LS2-1, MS-PS3-1, MS-PS2-5, MS-ESS2-4, MS-LS1-7, MS-PS1-5, MS-PS3-2</p>	<ul style="list-style-type: none"> •Identify objects within the solar system and explain how the solar system was formed •Describe the physical characteristics of the sun, including its interior and its atmosphere, and identify each of the inner and outer planets and describe the characteristics that distinguish them from one another •Explain how scientists classify small bodies in the solar system, including asteroids, meteors, and comets •Explain the big bang theory and reasons why scientists believe the universe is expanding •Describe the benefits that space technology has provided for modern society
<p>Unit 4: Weather and Climate</p> <p>In this unit, you will relate temperature and precipitation from around the globe to variations in weather. You will assess severe weather events and their likelihood. You will summarize the influences that cause uneven heating of Earth's surface and the resulting regional climates. You will relate the sun's energy to greenhouse gases in the atmosphere and their impact on temperature and habitability. You will evaluate carbon storage within Earth's systems.</p>	<p>MS-ESS2-5, MS-ESS2-6, MS-ESS3-2, MS-ESS1-3, MS-ESS3-2, MS-LS4-1, MS-PS1-2, MS-ETS1-3</p>	<ul style="list-style-type: none"> •Describe the water cycle and its processes •Name the main kinds of storms and explain how they form •Explain the factors that affect climate •Discuss greenhouse gases and their effect on organisms and the environment