

Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Science
Course ID	CASC62922	Grade Level	7
Course Name	Science 7 B	# of Credits	0.5
SCED Code	NoCourseSCED	Curriculum Type	Connections Academy

COURSE DESCRIPTION

Welcome to Science 7, 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-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
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-PS1-6	Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.
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-PS2-4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
MS-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-PS3-4	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-PS4-3	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.
MS-LS1-1	Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
MS-LS1-2	Develop and use models to describe the parts, functions, and basic processes of cells.
MS-LS1-3	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
MS-LS1-4	Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.
MS-LS1-5	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
MS-LS1-6	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
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-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of 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-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-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-LS4-4	Construct an explanation based on evidence that describes how genetic variations of traits in a population affects individuals' probability of surviving and reproducing in a specific environment.
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-ESS1-3	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-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
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-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-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
Unit 1: Structures and Properties of Matter In this unit, you will investigate the physical world from a chemical viewpoint. You will compare the physical and chemical properties of substances, create models of molecules, and demonstrate how different factors, such as thermal energy, affect substances. You will have an opportunity to design a procedure to separate a mixture and discuss with your classmates how thermal energy impacts a substance in different phases.	MS-PS1-1, MS-PS1-2, MS-PS1-4, MS-ESS2-5, MS-PS2-2, MS-PS3-4, MS-ESS2-4, MS-LS1-7, MS-PS1-5, MS-PS3-2, MS-PS1-1, MS-PS1-6, MS-LS1-4, MS-LS1-3	<ul style="list-style-type: none"> •Construct models that show that atoms are the building blocks of molecules •Investigate and explain how pure substances differ from one another •Describe and model the effect of the removal and addition of thermal energy on motion and temperature of different substances •Explain the effect on atomic and molecular motion of adding or removing thermal energy to a pure substance in different phases and during a phase change •Measure the effect sample size has on the change in temperature of a sample

<p>Unit 2: Forces and Motion</p> <p>Can you identify three forces acting on you right now? In this unit, you will investigate forces and motion by engaging in hands-on and virtual activities. You will demonstrate that outside forces can affect an object's motion, shape, and orientation. You will also collect data to verify Newton's third law of motion and explain the cause and effect relationship between an object's motion and the sum of the forces acting on it.</p>	MS-PS2-1, MS-PS2-2, MS-PS2-4, MS-ETS1-4, 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-PS1-6, MS-LS1-4, MS-LS1-3, MS-PS2-1	<ul style="list-style-type: none"> •Explain how motion is described •Analyze how outside forces affect an object's motion, position, and shape •Demonstrate Newton's third law of motion •Analyze how an object's mass affects its acceleration, and how a force exerted on the object affects its acceleration
<p>Unit 3: Earth's Interior Systems</p> <p>In this unit, you will explore, describe, discuss, and investigate the properties of different types of rocks and minerals as you engage in hands-on and virtual activities. You will also have the opportunity to discover and explore pieces of evidence that support the plate tectonics and continental drift theory. In this unit, you will learn about how scientists develop and use data to predict and monitor earthquakes, tsunamis, and volcanic eruptions.</p>	MS-ESS3-2	<ul style="list-style-type: none"> •Describe the properties of minerals •Explain the processes involved in the rock cycle. Investigate and describe the three major types of rocks: igneous, sedimentary, and metamorphic •Explain and describe the theory of plate tectonics and drifting continents Describe how earthquakes and volcanic eruptions occur •Analyze and interpret data sets that set the location and frequency of natural hazards like earthquakes and tsunamis
<p>Unit 4: Earth's Surface Systems</p> <p>In this unit, you will explore, describe, discuss, and investigate the processes of weathering, erosion, and deposition as you engage in hands-on and virtual activities. You will also have the opportunity to discover Earth's surface land and water features. In this unit, you will also learn about soil formation and conservation.</p>	MS-ESS2-1, MS-ESS2-2, MS-ESS2-3, MS-ESS2-4,	<ul style="list-style-type: none"> •Describe Earth's surface land and water features •Investigate the causes of weathering •Explain the processes of erosion and deposition and how they shape Earth's surface •Explain and describe the agents of erosion: gravity, water, wind, and glaciers •Describe how soil is formed and conserved