

Wyoming Department of Education Required Virtual Education Course Syllabus

2201001 - Washakie County School District No. 1

Program Name	Washakie #1 Online	Content Area	SC
Course ID	WOL-SC5F1	Grade Level	5
Course Name	WOL-Science 5	# of Credits	1.0
SCED Code	NA	Curriculum Type	Fuel Education

COURSE DESCRIPTION

Students perform experiments, develop scientific reasoning, and recognize science in the world around them. They build a model of a watershed, test how cell membranes function, track a hurricane, and analyze the effects gravity. Students will explore topics such as:

- Water Resources—water pollution; conservation; aquifers; watersheds; wetlands
- The World's Oceans—properties of ocean water; currents, waves, and tides; the ocean floor; marine organisms
- Earth's Atmosphere—layers; weather patterns, maps, and forecasts; fronts; El Niño; and the greenhouse effect
- Forces of Motion—types of pushes or pulls; position and speed; inertia; energy as a measure of work; gravity and motion
- Chemistry—structure of atoms; elements and compounds; the Periodic Table; chemical reactions; acids and bases
- Cells and Cell Processes—structure; membrane function; respiration and photosynthesis; growth cycles; genes and DNA
- Taxonomy of Plants and Animals—levels of classification; plants, animals, monerans, viruses, protists, and fungi
- Animal Physiology—circulatory, respiratory, digestive, excretory, and immune systems

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets
5-PS1-1	Develop a model to describe that matter is made of particles too small to be seen.
5-PS1-2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
5-PS1-3	Make observations and measurements to identify materials based on their properties.
5-PS1-4	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
5-PS2-1	Support an argument that the gravitational force exerted by Earth on objects is directed down.
5-PS3-1	Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
5-LS1-1	Support an argument that plants get the materials they need for growth primarily from air and water.
5-LS2-1	Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
5-ESS1-1	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
5-ESS1-2	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
5-ESS2-1	Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
5-ESS2-2	Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
5-ESS3-1	Obtain and combine information about ways individual communities use science ideas to conserve Earth's resources and environment.
3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3	Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

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LESSON TITLES	STANDARD	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
<p>Water Resources</p> <ul style="list-style-type: none"> Identify the various sources of water, its uses, and different ways to conserve it Identify the typical steps that water-treatment plants go through to purify drinking water Describe how both natural processes and human activities affect water quality in watersheds Differentiate between <i>point source pollution</i> and <i>nonpoint source pollution</i>, and identify some ways by which they can both be reduced Identify and describe the different parts of a watershed Interpret a topographic map to identify the boundaries of a watershed Explain how a model of something differs from the real thing, but can be used to learn about the real thing Explain why wetlands are important to watersheds and how they can improve water quality 	<p>5-ESS2-1 5-ESS2-2 5-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3</p>	<ul style="list-style-type: none"> I can examine water sources and usage. Explain that an aquifer stores groundwater. Identify and describe water resources. Explain the parts of the water cycle: evaporation, condensation, precipitation, runoff, collection, and seepage. Explore concepts to be addressed during the year in Science 5. Describe three or more ways in which water is used, such as for domestic, public, commercial, and irrigation purposes. Name three or more ways to conserve water, such as keeping showers short, turning off water while brushing teeth, and fixing leaking pipes. Identify the typical steps water-treatment plants go through to purify drinking water. Explain why it is important to conserve water. Describe how both natural processes and human activities affect water quality. Compare point-source and nonpoint-source pollution. Name ways in which nonpoint-source water pollution can be reduced. Identify and describe the parts of a watershed. Describe how both natural processes and human activities affect water quality in watersheds. Interpret symbols on a topographic map. Explain how people use topographic maps to help them study watersheds. Identify contour lines and use them to determine elevation. Explain how reading a contour map can help people find ways to keep the environment healthy. Interpret a topographic map to identify the boundaries of a watershed. Distinguish among different types of watershed drainage patterns. Relate watershed drainage patterns and the underlying geology of the land. Tell how knowledge of watershed drainage patterns is important to environmental protection. Use a topographic profile to make a 3-D model of a watershed. Explain how wetlands can improve water quality. Describe reasons why wetlands are important to the overall health of a watershed. Explain how wetlands form. Describe different types of wetlands. Identify the typical steps water-treatment plants go through to purify drinking water. Identify and describe the parts of a watershed. Describe how both natural processes and human activities affect water quality in watersheds. Interpret a topographic map to identify the boundaries of a watershed. Identify the various sources of water, its uses, and different ways to conserve it. Differentiate between point-source pollution and nonpoint-source pollution and identify some ways by which they can both be reduced.
<p>The World's Oceans</p>	<p>5-PS3-1 5-LS1-1 5-LS2-1</p>	<ul style="list-style-type: none"> I can read scientific text and complete online activities to learn about the major features of the ocean floor, including the continental shelf,

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<ul style="list-style-type: none"> • Explain that water covers approximately three-quarters of the Earth's surface and that, since all the earth's oceans are connected, their water circulates through them all • Define <i>salinity</i> and explain how the density of ocean water changes as salinity levels and temperature change • Describe the movements of both the ocean's surface currents and its deep-water currents • Explain how ocean waves form, identify their properties (such as height, length, crest, and trough), and describe their motions • Explain how the combined gravitational pull of the sun and moon causes daily high and low tides • Explain that the monthly cycle of spring and neap tides results when the earth, sun, and moon change their relative positions • Describe characteristics of ocean habitats, and explain how various organisms are adapted to living in them • Explain that the continental margin extends into the ocean and has three regions: the continental shelf, the continental slope, and the continental rise • Describe some major features of the ocean floor, such as abyssal plains, trenches, ridges, seamounts, and reefs • Identify some devices scientists use to study the ocean, including submersibles, sonar, and satellites • Identify some ocean resources, such as fish, oil, and minerals, and describe how each one is obtained 	<p>5-ESS2-1 5-ESS2-2 5-ESS3-1 3-5 ETS1-1 3-5 ETS1-2</p>	<p>continental slope, continental rise, abyssal plains, trenches, ridges, seamounts, and reefs.</p> <ul style="list-style-type: none"> • State that approximately three quarters of the Earth's surface is covered by water. Define salinity as the amount of salt and other dissolved minerals in ocean water. Describe how the density of ocean water modifies with changes in salinity and temperature. State that the Earth's four oceans are connected, allowing ocean water to circulate globally. • State that surface currents are caused by prevailing winds on the ocean's surface. Explain how the Gulf Stream helps moderate the climate of Western Europe. Describe the movements of deep-water currents in the ocean. • Explain the factors that influence the size of an ocean wave and describe a wave's motion. Identify and describe the different parts of a wave (wave height, wavelength, crest, and trough). Explain how changing the frequency of a wave affects its wavelength. • Identify the relative positions of the Earth, sun, and moon during spring and neap tides. Describe the characteristics of an intertidal zone and how organisms have adapted to live there. Explain how the gravitational pull of the sun and moon causes daily high and low tides. • Define an estuary as a bay or inlet where fresh river water mixes with ocean water. Describe environmental impacts in estuaries. Explain why salt marshes and mangroves are some of the most biologically productive areas on Earth. Describe life on sandy beaches. • Identify and describe the major features of the ocean floor (for example, the continental shelf, continental slope, continental rise, abyssal plains, trenches, ridges, seamounts, and reefs). • Identify the different zones within the ocean and describe the organisms that live there. Describe the characteristics of a hydrothermal vent. Recognize that many varieties of organisms live in a vent community. • Explain how satellites are used to study the ocean. Describe how sonar is used to map the ocean floor. Identify underwater research tools and facilities and explain how they are used. • Identify some ocean resources, such as fisheries, oil, and minerals, and describe how they are harvested. • Explain that water covers approximately three quarters of the Earth's surface and that all the oceans are connected, allowing their water to circulate. Define salinity, and explain how density changes with salinity and temperature. Describe the movements of both the ocean's surface currents and its deep-water currents. Explain how ocean waves form, identify their properties--such as wave height, wavelength, crest, and trough--and describe their motion. Explain how the gravitational pull of

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		<p>the sun and moon causes daily high and low tides. Explain that the monthly cycle of spring tides and neap tides occurs because the Earth, sun, and moon change their relative positions. Describe characteristics of ocean habitats and explain how various organisms are adapted to living in them. Explain that the continental margin extends into the ocean and has three regions: the continental shelf, the continental slope, and the continental rise. Describe major features of the ocean floor, such as abyssal plains, trenches, ridges, seamounts, and reefs. Identify some ocean resources, such as fish, oil, and minerals, and describe how they are harvested.</p>
<p>Earth's Atmosphere</p> <ul style="list-style-type: none"> Describe some properties of the atmosphere, such as its composition, density, and pressure, and explain how air density is related to both temperature and pressure Identify the five layers of the atmosphere: troposphere, stratosphere, mesosphere, thermosphere, and exosphere Explain that the uneven heating of the earth's surface transfers heat through convection currents in the atmosphere Define humidity as the amount of water vapor in the air, and the dew point as the temperature at which the air cannot hold any more water vapor Explain how clouds form, and identify common weather patterns associated with different types of clouds Identify types of precipitation (rain, snow, sleet, and hail) and explain how each type forms Identify some sources of air pollution Identify the three main types of storms and describe the air movements that produce them Identify the four types of fronts (cold, warm, stationary, and occluded) and describe how air masses interact Interpret weather maps to forecast the weather Distinguish between weather and climate, and describe some factors that influence climate (such as latitude, altitude, and ocean currents) Describe possible causes of climate changes (such as El Niño and the Greenhouse Effect) and their potential effects on climate <p>Earth and Space – Add On Unit – Supplemental The Universe and its Stars:</p> <ul style="list-style-type: none"> Understand that the sun is a star that appears larger and brighter because it is closer to the Earth. Using digital simulations, understand the orbits of Earth and other planets around the sun, and of the moon(s) around Earth and other planets. Understand the rotation of the Earth on its axis. Understand “day” and “night” Understand daily changes in time depending on the time of year. 	<p>5-ESS2-1 5-ESS1-1 5-ESS1-2</p>	<ul style="list-style-type: none"> Compare the layers of the atmosphere according to properties such as temperature and composition. Explain how air density is related to both temperature and pressure. Explain that air moves from regions of high density to regions of low density. Describe the circulation of air and the transfer of heat between the equator and the poles. Explain how winds occur. Define humidity as the amount of water vapor in the air and the dew point as the temperature at which water vapor in the air will condense. Describe how dew and frost form. Determine relative humidity. Explain how clouds form and identify common cloud types according to their height and appearance. Describe the characteristics of thunderstorms, tornadoes, and hurricanes. Describe how thunderstorms, tornadoes, and hurricanes form. Identify tools meteorologists use to measure weather data. Identify the four types of fronts (cold, warm, stationary, and occluded) and describe how air masses interact. Interpret weather maps to forecast the weather. Distinguish between weather and climate and describe some factors that influence climate (such as latitude, topography, prevailing winds, and oceans). Describe tropical, temperate, and polar climate types. Locate regions of a particular climate on a map. Explain the contributing factors leading to global warming. Describe the greenhouse effect. Describe how El Niño contributes to climate trends. Interpret weather maps to forecast the weather. Describe some properties of the atmosphere, such as its composition, density, and pressure. Explain how air density is related to both temperature and pressure. Identify the five layers of the atmosphere: troposphere, stratosphere, mesosphere, thermosphere, and exosphere. Explain that the uneven heating of the Earth's surface transfers heat

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<ul style="list-style-type: none"> Study shadows and understand changes in length and direction depending on the time of day, month, and year. 		<p>through convection currents in the atmosphere. Define humidity as the amount of water vapor in the air and the dew point as the temperature at which the air cannot hold any more water vapor. Explain how clouds form and identify common weather patterns associated with different types of clouds. Identify types of precipitation (rain, snow, sleet, hail) and explain how each is formed. Identify sources of air pollution. Identify the three main types of storms and describe the air movements that produce them. Identify types of fronts and explain how air masses interact in cold and warm fronts. Distinguish between weather and climate and describe some factors that influence climate (such as latitude, altitude, and ocean currents). Describe possible causes of climate changes (such as El Niño and the greenhouse effect) and their potential effects on climate.</p>
<p>Motion and Forces</p> <ul style="list-style-type: none"> Plot the movement of an object across a surface as separate horizontal and vertical movements State that moving objects always travel in one direction with constant speed unless a force—a push or a pull—is applied to them Describe the <i>mass</i> of an object as a measure of how difficult it is to change the object's speed or direction Identify different pushes and pulls (spring-driven, muscular, wind driven, magnetic, or electric) as forces that can change an object's speed and direction State that every push or pull on one thing causes a balancing push or pull in the other direction on something else, and demonstrate in some actual situations in which these two sides of any given force are always present Identify the forces that are in balance when an object's speed and direction stay constant State that <i>energy</i> is a measure of how much work an object, or set of objects, can do State that the total amount of energy in a system always remains constant Recognize that moving objects have energy (kinetic energy), and that the position of an object may give it the ability to do work (potential energy) Describe how levers change the effects of pushes and pulls Recognize that for an object to continue moving in a circle, a force must pull the object toward the center of the circle, and predict that if the force disappears, the object will continue to move in a straight line Recognize that objects are pulled toward the earth by a force known as <i>gravity</i> Recognize that, regardless of the mass of a falling object, its speed toward the ground increases at the same rate as that of any other object State that any two masses have a gravitational pull between them, but this pull is easily noticeable only if at least one mass is very large 	<p>4-PS3-1 5-PS2-1</p>	<ul style="list-style-type: none"> I can read scientific text, view online simulations and diagrams, and complete thought experiments using real-life examples to understand the effect of gravity, the sun, and the moon on the Earth and its processes. I can read text and complete online activities to learn about the different forms of energy. I can define potential and kinetic energy. I can answer questions and thought experiments about motion of everyday objects with consideration for Newton's laws of motion. Measure and graph the movement of an object's speed in a straight line. Estimate speed by dividing the distance an object travels by the time it takes to travel that distance. Describe how fast an object moves as the speed and direction of the object over time. State the difference between speed and velocity. State that objects keep moving with constant speed and direction unless there is an extra push or pull (force) to change their motion. Describe the mass of an object as a measure of how hard it is to change its speed or direction. Identify different "pushes" and "pulls" (electric, magnetic, muscular, spring-driven, wind-driven) as forces that can change an object's speed and direction. State that every push or pull (force) on one thing must make a balancing push or pull in the other direction on something else. Identify the forces that are in balance when an object's speed and direction stay constant. State that energy is the ability to do work. State that all the energy in a system added together always stays constant (is conserved). Explain the difference between potential energy and kinetic energy. In a moving system, identify where the kinetic and potential energies are contained. Recognize that a force acting over a distance changes the energy of an object.

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<ul style="list-style-type: none"> Recognize that the pull decreases as the masses move farther apart, and increases as the size of either mass increases Recognize that gravity causes the moon to orbit the earth and the planets to orbit the sun Recognize that gravity is the primary force that shapes everything from clusters of stars to enormous galaxies Describe how our attempt to understand gravity has led to changes in our understanding of our solar system, our galaxy, and even our universe 		<ul style="list-style-type: none"> Describe how simple machines change the work-distance relationship to make effort easier. Describe examples of simple machines in everyday life. Explain the forces at work that will cause an object to move in a circle. Predict how the motion of an object will change if the force applied to the object is more or less, or the speed of the object is faster or slower, or both. State that if the force holding an object in a circular motion suddenly falls to zero, the object will continue to move in a straight line with the same energy. State that near the Earth's surface, objects with no other force acting on them accelerate downward at a constant rate. Define weight as the product of an object's mass and the gravitational force on it. State that any two masses have a gravitational pull between them, but this pull is easily noticeable only if the mass of at least one is very great. Recognize that the pull decreases as the masses move farther apart, and increases as the mass of either increases. Describe the role of gravity in maintaining a planet's orbit around the sun. Define weight as the result of the force of gravity on mass.
<p>Chemistry</p> <ul style="list-style-type: none"> Explain that atoms are composed of a nucleus containing protons (with positive charge) and neutrons (with a neutral charge) Explain that negatively charged electrons move around the nucleus in paths called <i>shells</i> Describe a <i>compound</i> as a substance made of two or more elements Explain that the properties of a compound differ from the properties of the elements that make it up Recognize that each element is made of only one kind of atom Explain that all the elements are organized in the Periodic Table of the Elements according to their chemical properties Describe some properties of metals and nonmetals Identify some common elements and compounds by both their chemical symbols and their formulas Recognize that in chemical reactions, the original atoms rearrange themselves into new combinations, and that these new combinations have properties differing from those of the reacting compounds Write chemical equations to show what happens in a chemical reaction Use the pH scale to determine whether a solution is acidic or basic Recognize that compounds can be identified by chemical reactions Recognize that a wide variety of materials, and indeed living organisms, are often composed of just a few elements Explain that all chemical reactions require energy Describe how reaction rates increase with temperature, surface area, concentration, and the presence of a catalyst 	<p>5-PS1-1 5-PS1-2 5-PS1-3 5-PS1-4</p>	<ul style="list-style-type: none"> I can examine the periodic table of elements and learn the properties of elements. I can perform online activities examining chemical reactions and physical and chemical changes. I can share conclusions by presenting the results of my data in written, oral, and visual form. I can perform numerous laboratory experiments, including testing acids and bases. I can read scientific text and view diagrams showing that in the 1700s Antoine Lavoisier showed that a substance can burn, but fire does not destroy the matter, fire only changes matter's form. Recognize that atoms of each element are exactly alike. Identify the three main parts of atoms as protons, electrons, and neutrons, and that protons have a positive charge, electrons a negative charge, and neutrons have no charge at all. Describe the current model of the atom as a positively charged nucleus containing the protons and neutrons surrounded by electrons moving in certain regions within an "electron cloud". State that atoms of different elements have different masses depending on the number of protons, electrons, and neutrons, but that most of the mass comes from the protons and neutrons. Describe the current model of the atom as a positively charged nucleus containing the protons and neutrons surrounded by electrons moving in certain regions within an electron "cloud." Explain that all the elements are organized in the Periodic Table of the Elements according to their chemical properties. Describe the common properties of metals (for example, they have luster, are bendable, and are good conductors of heat and electricity). Describe the common properties of

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		<p>nonmetals (for example, they are dull, brittle, and are poor conductors of heat and electricity). Find the number of protons, electrons, and neutrons in an atom using its atomic number (the number of protons) and mass number (the number of protons and neutrons).</p> <ul style="list-style-type: none"> • Define a compound as a substance made of two or more elements. Explain that the properties of a compound differ from those of the elements that make up the compound. Recognize that elements combine in certain specific proportions to form compounds. Use the chemical formula of a compound to identify the elements from which it is composed, and determine the number of each type of atom in the compound. • Identify the reactants and products in a chemical equation. Match chemical equations to word equations. Recognize that in chemical reactions the original atoms rearrange themselves into new combinations, and that the resulting products have properties differing from those of the reacting compounds. Recognize that for every chemical reaction the number of atoms of each element must be the same for both the reactants and the products. • Describe properties of acids (for example, acids taste sour, are corrosive, and contain the element hydrogen). Describe properties of bases (for example, bases taste bitter and feel slippery when dissolved in water). Use the pH Scale to determine whether a solution is acidic or basic. • Name four types of evidence of a chemical reaction: Change in temperature, color change, release of a gas, and the formation of a precipitate. Describe one method of identifying a compound or element in a product of a chemical reaction. • Define organic compounds as carbon-based, such as those produced by living things and certain others produced in chemistry laboratories. Define inorganic compounds as those that do not usually contain the element carbon. Recognize that living organisms are composed of mainly just a few elements: carbon, hydrogen, oxygen, and nitrogen. Describe the functions of proteins, lipids, and carbohydrates in human nutrition. • Explain that all chemical reactions require a certain amount of energy in order to break existing bonds in the reactants and form new bonds in the products. , Recognize that enzymes can act as catalysts to speed up chemical reactions in the human body. Identify four ways to increase the rate of a chemical reaction (increase the temperature, surface area, concentration, and add a catalyst). • Identify the three main parts of atoms as protons, electrons, and neutrons, and that protons have a positive charge, electrons a negative charge, and neutrons have no charge at all. Describe the current model of the atom as a positively charged nucleus

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		<p>containing the protons and neutrons surrounded by electrons moving in certain regions within an "electron cloud". Explain that all the elements are organized in the Periodic Table of the Elements according to their chemical properties. Recognize that in chemical reactions the original atoms rearrange themselves into new combinations, and that the resulting products have properties differing from those of the reacting compounds. Use the pH Scale to determine whether a solution is acidic or basic. Recognize that the atoms of an element are exactly alike and that each element is made of only one kind of atom. Describe the common properties of metals and nonmetals. Identify some common elements and compounds by both their chemical symbols and their formulas. Describe a compound as a substance made of two or more elements. Explain that the properties of a compound differ from those of the elements that make up the compound. Write chemical equations to show what happens in a chemical reaction. Explain that all chemical reactions require energy. Describe how reaction rates increase with temperature, surface area, concentration, and in the presence of a catalyst. Demonstrate mastery of the skills taught in this unit. Identify some parts of the human endocrine system and their function (pituitary gland, thyroid gland, adrenal gland, and pancreas).</p>
<p>Cells and Cell Processes</p> <ul style="list-style-type: none"> • Explain the major ideas of the cell theory • Identify the major structures of cells, and describe their functions • Compare plant and animal cells • Explain that different types of substances move across the cell membrane by means of diffusion, osmosis, and carrier molecules • Explain that plant cells store energy through photosynthesis, and that plant and animal cells release energy during respiration • Explain that all cells have a cycle of growth, called <i>interphase</i>, and a cycle of division, called <i>mitosis</i> • Identify the four stages of mitosis: prophase, metaphase, anaphase, and telophase • Explain that all the information an organism needs to live and reproduce is contained in its DNA • Explain that traits are passed from parents to offspring and are determined by a pair of genes, one of which comes from each parent 	<p>5-PS1-1 5-LS1-1</p>	<ul style="list-style-type: none"> • I can read scientific text and complete online activities about the body systems of animals. • I can read scientific text, examine diagrams, and complete online activities that explore heredity. • I can conduct an experiment to provide evidence that all living things are made of cells. • I can describe the parts, functions and processes of cells. • I can explain how genetic factors influence the growth of organism. • Identify the major structures of the cell (such as cell membrane, cytoplasm, and nucleus) and describe their functions. Describe the three major ideas of the cell theory. • Recognize the major cell organelles (for example, endoplasmic reticulum, ribosomes, Golgi bodies, chloroplasts, chromosomes, mitochondria, and vacuoles) and describe their functions. Distinguish between plant and animal cells. • Define diffusion as the process by which molecules move from areas of higher concentration to areas of lower concentration. , Recognize that water moves through membranes by osmosis--diffusion of water through a semipermeable membrane. Recognize various ways in which molecules are transported across the cell membrane. • Describe the process of cellular respiration. Describe the process of photosynthesis in plants.

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		<ul style="list-style-type: none"> Identify and describe the four stages of mitosis: prophase, metaphase, anaphase, and telophase. Recognize that dividing plant and animal cells have a cycle with three phases: interphase, mitosis, and cytokinesis. Recognize that interphase is a period of growth and the copying of the genetic material. Recognize that mitosis is a period of division of the cell nucleus. Recognize that cytokinesis is a final event of cell division after mitosis. Demonstrate mastery of the skills taught in this lesson. Describe the structure of DNA as two twisted chains of molecular pieces with pairs of bases attached between them like rungs on a ladder. Explain that all the information an organism needs to live and reproduce is contained in its DNA. Explain that traits are passed from parents to offspring and are determined by genes, with an individual having two copies of each gene, one from each parent. Distinguish between dominant and recessive forms of genes. Use a Punnett square to determine the genetic combinations and traits possible in offspring of a simple genetic cross. Demonstrate knowledge and skills gained in this unit. Describe the three major ideas of the cell theory. Distinguish between plant and animal cells. Identify the major structures of cells and describe their functions (nucleus, cytoplasm, cell wall, cell membrane, chromosomes, mitochondria, and chloroplasts). Explain that different types of substances move across the cell membrane by means of diffusion, osmosis, and active transport. Explain that plant cells store energy through photosynthesis and that plant and animal cells release stored energy during respiration. Demonstrate mastery of the skill taught in this unit.
<p>Taxonomy of Plants and Animals</p> <ul style="list-style-type: none"> Recognize that living things are classified according to shared characteristics, and that there are seven major levels of classification: kingdom, phylum, class, order, family, genus, and species Name the five kingdoms (plants, animals, monerans, protists, and fungi) and identify some organisms from each Describe <i>vascular plants</i> as plants that have systems for transporting water, sugar, and minerals, whereas <i>nonvascular</i> plants lack these structures Explain how sugar, water, and minerals are transported in vascular plants Compare the common characteristics, adaptations, and life cycles of gymnosperms and angiosperms 	<p>5-LS1-1 5-LS2-1</p>	<ul style="list-style-type: none"> I can complete phylogenetic trees, and read scientific text explaining the similarities and differences between organisms. State that Carolus Linnaeus developed a system for naming and classifying organisms that is still used today. Recognize that an organism's scientific name is made up of the genus and species the organism belongs to. Recognize that living things are classified by shared characteristics. Identify the seven major levels of classification: Kingdom, Phylum, Class, Order, Family, Genus, and Species. Name the six kingdoms: Archaeobacteria, Eubacteria, Protista, Fungi, Planta, and Animalia. Identify two characteristics common to organisms in Kingdom Archaeobacteria (live without oxygen, live in extreme environments both hot and cold). Identify one organism in Kingdom Archaeobacteria. Identify a characteristic common to organisms in Kingdom Eubacteria (live in less extreme environments). Identify one organism in Kingdom Eubacteria.

SCOPE AND SEQUENCE

LESSON TITLES	STANDARD	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
		<ul style="list-style-type: none"> Identify two characteristics common to organisms in Kingdom Protista (thrive in wet environments, most are single celled). Identify two organisms in Kingdom Protista (protozoa, amoeba, paramecium, algae, seaweed, water mold, slime mold). State that protists are often grouped according to whether they are plant-like, fungus-like or animal-like. Identify characteristics common to organisms in Kingdom Fungi (grow best in warm, moist conditions; reproduce through spores). Identify two organisms in Kingdom Fungi (mushroom, lichens, some molds, yeast). Identify characteristics common to organisms in Kingdom Planta (all except mosses are vascular, all use photosynthesis to get nutrients). Identify two plants in Kingdom Planta. Describe vascular plants as plants that have systems for transporting water, sugar, and minerals, whereas nonvascular plants lack these structures. Explain how sugar, water, and minerals are transported in vascular plants. Compare characteristics of gymnosperms and angiosperms. Identify characteristics common to organisms in Kingdom Animalia (multicellular, need to get food from an outside source). Identify two organisms in Kingdom Animalia that are vertebrates. Identify two organisms in Kingdom Animalia that are invertebrates. Recognize that Kingdom Animalia includes organisms that are vertebrates and invertebrates. Demonstrate mastery of the skills taught in this unit. Explain how sugar, water, and minerals are transported in vascular plants. Recognize that living things are classified by shared characteristics, and that there are seven major levels of classification: kingdom, phylum, class, order, family, genus, and species. Name the six kingdoms (Archaea, Bacteria, Protista, Fungi, Planta, and Animalia) and identify organisms from each. Compare the characteristics of the various groups of plants.
<p>Animal Physiology</p> <ul style="list-style-type: none"> Recognize that all body systems play a role in maintaining a constant internal environment Describe how the circulatory system transports oxygen and nutrients to cells while removing carbon dioxide and other wastes Recognize that many organisms have specialized structures for respiration, digestion, waste disposal, and immune response, and that these structures are responsible for the transportation of materials such as oxygen, carbon dioxide, and nutrients Explain how blood flows through the human heart Describe how the respiratory system exchanges carbon dioxide and oxygen in the lungs 	<p>3-LS1-1 3-LS2-1 3-LS3-1 3-LS3-2 3-LS4-1 3-LS4-2 3-LS4-3 3-LS4-4 5-LS1-1 5-LS2-1</p>	<ul style="list-style-type: none"> I can read scientific text and complete online activities about the cell and cell organelles. I can read scientific text, examine diagrams, and complete online activities that explore animal reproduction. I can answer questions about animal physiology. I can define behavior and connect the characteristics and behaviors of an organism to biological adaptation. I can describe the parts, functions and processes of cells. Recognize that all body systems play a role in maintaining a constant internal environment. Describe how bones and muscles interact to cause movement.

SCOPE AND SEQUENCE

LESSON TITLES	STANDARD	OUTCOMES OBJECTIVES/STUDENT CENTERED GOALS
<ul style="list-style-type: none"> Put the various steps in digestion into correct order, describing the function of the mouth, esophagus, stomach, small intestine, large intestine, and liver 		<ul style="list-style-type: none"> Identify the parts of the human nervous system and their function (brain, spinal cord, and nerves). Identify some parts of the human endocrine system and their function (pituitary gland, thyroid gland, adrenal gland, and pancreas). Identify the parts of the human respiratory system (nose, mouth, trachea, lungs, diaphragm). Describe how the respiratory system exchanges carbon dioxide and oxygen in the lungs. Demonstrate mastery of the skills taught in this lesson. Recognize that the circulatory system transports oxygen and nutrients to cells while carrying carbon dioxide and other wastes for removal. Recognize that some organisms have no circulatory system, some have an open circulatory system, and others have a closed circulatory system. Explain how blood flows through the human heart. Identify the structures of the heart (atria, ventricles, valves, major veins and arteries). Demonstrate mastery of the skills taught in this lesson. Sequence the digestion process. Identify the structures involved in the digestive process and describe their function (mouth, esophagus, stomach, small intestine, large intestine, and liver). Demonstrate mastery of the skills taught in this lesson. Identify the organs of the excretory system and describe their function (lungs, liver, kidneys, and skin). Explain how the excretory system removes cellular waste from the blood, converts it to urine, and stores it in the bladder before it leaves the body. Demonstrate mastery of the skills taught in this lesson. Describe some reproduction differences between animals. Identify the structures involved with the immune system and describe their function (bone marrow, white blood cells, and lymphocytes). Identify two ways we can work to keep our immune system healthy (get vaccines, eat healthful foods). Recognize that different organisms reproduce through division or fusion. Recognize that all body systems play a role in maintaining a constant internal environment. Describe how the respiratory system exchanges carbon dioxide and oxygen in the lungs. Explain how blood flows through the human heart. Explain how the excretory system removes cellular waste from the blood, converts it to urine, and stores it in the bladder before it leaves the body. Recognize that the circulatory system transports oxygen and nutrients to cells while removing carbon dioxide and other wastes. Put the steps of digestion in the correct order and describe the function of the structures that are part of the digestive process. Describe the functions of the immune system. Describe the reproductive system of some animals.