Montana Science Standards to NGSS Crosswalk

Grade 6-8 Physical Science		
MT Science PE	**NGSS PE**	**Links**
develop and critique models that describe the atomic composition of simple molecules and extended structures	MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.	NGSS PE Evidence Statement NSTA Lesson Resources
analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred	MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred	NGSS PE Evidence Statement NSTA Lesson Resources
gather information to describe that synthetic materials come from natural resources and impact society	MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.	NGSS PE Evidence Statement NSTA Lesson Resources
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-PS1-4. 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.	NGSS PE Evidence Statement NSTA Lesson Resources
develop, use, and critique a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved	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.	NGSS PE Evidence Statement NSTA Lesson Resources
undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes	MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.	NGSS PE Evidence Statement NSTA Lesson Resources
apply Newton's Third Law of Motion to design a solution to a problem involving the motion of two colliding objects	MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.*	NGSS PE Evidence Statement NSTA Lesson Resources
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-PS2-2. 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.	NGSS PE Evidence Statement NSTA Lesson Resources
ask questions about data to determine the factors affecting electric and magnetic force strengths	MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	NGSS PE Evidence Statement NSTA Lesson Resources
construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the mass of interacting objects	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	NGSS PE Evidence Statement NSTA Lesson Resources
Grade 6-8 Physical Science		

MT Science PE	NGSS PE	Links
design and conduct an investigation to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact	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.	NGSS PE Evidence Statement NSTA Lesson Resources
construct and interpret graphic displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object	MS-PS3-1. 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.	NGSS PE Evidence Statement NSTA Lesson Resources
develop and critique models to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system	MS-PS3-2. 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.	NGSS PE Evidence Statement NSTA Lesson Resources
apply scientific principles to design, construct, and test a device that minimizes or maximizes thermal energy transfer	MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.*	NGSS PE Evidence Statement NSTA Lesson Resources
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-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.	NGSS PE Evidence Statement NSTA Lesson Resources
construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object	MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	NGSS PE Evidence Statement NSTA Lesson Resources
use mathematical representations to describe a simple model for waves that includes how the amplitude and wavelength of a wave is related to the energy in a wave	MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	NGSS PE Evidence Statement NSTA Lesson Resources
develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials	MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	NGSS PE Evidence Statement NSTA Lesson Resources
Grade 6-8 Life Science		

Montana Science Standards to NGSS Crosswalk

MT Science PE	NGSS PE	Links
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-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.	NGSS PE Evidence Statement NSTA Lesson Resources
develop and use a model to describe the structure and function of a cell as a whole and ways parts of cells contribute to the function	MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.	NGSS PE Evidence Statement NSTA Lesson Resources
use argument supported by evidence for how the body is a system of interacting subsystems composed of groups 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.	NGSS PE Evidence Statement NSTA Lesson Resources
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-LS1-6. 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.	NGSS PE Evidence Statement NSTA Lesson Resources
develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth, release energy, or both, as this matter moves through an organism	MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	NGSS PE Evidence Statement NSTA Lesson Resources
analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem and analyze scientific concepts used by American Indians to maintain healthy relationships with environmental sources	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.	NGSS PE Evidence Statement NSTA Lesson Resources
develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of 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.	NGSS PE Evidence Statement NSTA Lesson Resources
construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems	MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	NGSS PE Evidence Statement NSTA Lesson Resources
evaluate competing design solutions for maintaining biodiversity and ecosystem services	MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*	NGSS PE Evidence Statement NSTA Lesson Resources
Grade 6-8 Life Science		

MT Science PE	NGSS PE	Links
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-LS1-4. 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.	NGSS PE Evidence Statement NSTA Lesson Resources
construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth and development of organisms	MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	NGSS PE Evidence Statement NSTA Lesson Resources
develop and use a model to describe why structural changes to genes, such as mutations, may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism	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.	NGSS PE Evidence Statement NSTA Lesson Resources
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-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.	NGSS PE Evidence Statement NSTA Lesson Resources
gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms	MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	NGSS PE Evidence Statement NSTA Lesson Resources
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-LS4-1. 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.	NGSS PE Evidence Statement NSTA Lesson Resources
Grade 6-8 Life Science		
MT Science PE	**NGSS PE**	**Links**

apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships	MS-LS4-2.	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	NGSS PE Evidence Statement NSTA Lesson Resources
analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy	MS-LS4-3.	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	NGSS PE Evidence Statement NSTA Lesson Resources
construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment	MS-LS4-4.	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	NGSS PE Evidence Statement NSTA Lesson Resources
use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time	MS-LS4-6.	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	NGSS PE Evidence Statement NSTA Lesson Resources

Grade 6-8 Earth/Space Science

Montana Science Standards to NGSS Crosswalk

MT Science PE	NGSS PE		Links
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-ESS1-1.	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.	NGSS PE Evidence Statement NSTA Lesson Resources
develop and use a model to describe the role of gravity in the motions within galaxies and the solar system	MS-ESS1-2.	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.	NGSS PE Evidence Statement NSTA Lesson Resources
analyze and interpret data to determine scale properties of objects in the solar system	MS-ESS1-3.	Analyze and interpret data to determine scale properties of objects in the solar system.	NGSS PE Evidence Statement NSTA Lesson Resources
construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6 billion-year-old history	MS-ESS1-4.	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	NGSS PE Evidence Statement NSTA Lesson Resources
construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time scales and spatial scales	MS-ESS2-2.	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	NGSS PE Evidence Statement NSTA Lesson Resources
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-ESS2-3.	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	NGSS PE Evidence Statement NSTA Lesson Resources
develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process	MS-ESS2-1.	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	NGSS PE Evidence Statement NSTA Lesson Resources
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-ESS2-4.	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	NGSS PE Evidence Statement NSTA Lesson Resources
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-ESS3-1.	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.	NGSS PE Evidence Statement NSTA Lesson Resources
Grade 6-8 Earth/Space Science			

Montana Science Standards to NGSS Crosswalk

MT Science PE	NGSS PE		Links
collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions	MS-ESS2-5.	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	NGSS PE Evidence Statement NSTA Lesson Resources
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-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.	NGSS PE Evidence Statement NSTA Lesson Resources
ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	NGSS PE Evidence Statement NSTA Lesson Resources
analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects	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.	NGSS PE Evidence Statement NSTA Lesson Resources
apply scientific principles to design a method for monitoring and minimizing a human impact on the environment	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.*	NGSS PE Evidence Statement NSTA Lesson Resources
construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems including indigenous populations	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	NGSS PE Evidence Statement NSTA Lesson Resources