



Wyoming Department of Education Required Virtual Education Course Syllabus

Park County School District # 1

Course Information

Program Name	Park #1 Online
Course ID	OL2330 A
Course Name	MS Physical Science A
SCED Code	03239G0.5012
Content Area	Science
Grade Level	6th, 7th, 8th
# of Credits	0.5
Curriculum Type	District Developed

Please give a concise description of this course including the purpose and what students will demonstrate and/or gain from this course.

MS Physical Science offers middle school students the opportunity to learn about physical science phenomena through a three-dimensional approach. In Part A of this course, students will learn about: the structure and properties of matter, chemical reactions, nuclear processes, forces and motion, types of interactions, stability and instability in physical systems, and energy in congruence with developing engineering and experimental design practices enveloped within unifying crosscutting concepts.

Wyoming Content and Performance Standards

Standard	<u>BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets</u>
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.

Wyoming Content and Performance Standards

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 a model 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-PS2-5	Construct 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-PS3-3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
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-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 criteria for success.
MS-ETS2-2	Develop a model defining and prioritizing the impacts of human activity on a particular aspect of the environment, identifying positive and negative consequences of the activity, both short and long-term, and investigate and explain how the ethics and integrity of scientists and engineers and respect for individual property rights might constrain future development.

Scope and Sequence

Unit Outline	Standard #	Outcomes Objectives/Student Centered Goals
<p>MS-PS1 Reading/Video Resources</p> <ul style="list-style-type: none"> • Introduction to Matter reading/video assignment • Introduction to Matter vocabulary practice • Introduction to Matter Quiz • Elements and the Periodic Table reading/video assignment • Elements and the Periodic Table vocabulary practice • Elements and the Periodic Table Quiz • Atoms and Bonding reading/video assignment • Atoms and Bonding vocabulary practice • Atoms and Bonding Quiz • Solids, Liquids, and Gases reading/video assignment • Solids, Liquids, and Gases vocabulary practice • Solids, Liquids, and Gases Quiz <p>MS-PS3 Reading/Video Resources</p> <ul style="list-style-type: none"> • Energy reading/video assignment • Energy vocabulary practice • Energy quiz • Thermal Energy and Heat reading/video assignment • Thermal Energy and Heat vocabulary practice • Thermal Energy and Heat Quiz <p>Unit Discussions</p> <ul style="list-style-type: none"> • How is Matter Described? • Why Does a Substance Change State? • How is Energy Conserved in a Transformation? • How Does Heat Flow from One Object to another Object? <p>Projects/Labs/Performance Tasks</p> <ul style="list-style-type: none"> • Research an element and create a tile for class periodic table • Atomic Structure Model • Modeling Molecular Movement • Temperature and Volume Lab 	<p>MS-PS1-1 MS-PS1-4 MS-PS3-3 MS-PS3-4</p>	<p>Upon the completion of this unit students will be able to formulate an answer to the big question: How does a change in thermal energy affect matter? Students will use the engineering design process, scientific design process, and cross-cutting concepts to explore the structure and properties of matter: being able to describe the atomic composition of molecules and predicting particle motion in relationship to the addition or removal of thermal energy. Students will relate the definitions of energy to atomic composition and particle motion to determine the relationship between matter and energy as well as understand of how energy is transferred from one object to another object without new energy being created or existing energy being destroyed.</p>

Scope and Sequence

<ul style="list-style-type: none"> • Design a Heating or Cooling Device • The States of Butter • In Hot Water Project • How Does Ice Cool Lab • Using Scientific Tools to Make Observations • Measurement: SI Units 		
<p>MS-PS1 Reading/Video Resources</p> <ul style="list-style-type: none"> • Atoms and Bonding reading/video assignment • Atoms and Bonding vocabulary practice • Atoms and Bonding Quiz • Chemical Reactions reading/video assignment • Chemical Reactions vocabulary practice • Chemical Reactions Quiz • Acids, Bases, and Solutions reading/video assignment • Acids, Bases, and Solutions vocabulary practice • Acids, Bases, and Solutions Quiz <p>MS-ETS Reading/Video Resources</p> <ul style="list-style-type: none"> • Investigate the Plastic Problem/Engineering for Good (https://wyoming.pbslearningmedia.org/resource/plasticproblem/investigate-the-plastic-problem-engineering-for-good/?#.W3MtOuhKh9M) <p>Unit Discussions</p> <ul style="list-style-type: none"> • How are physical and chemical reactions distinguished? • How is matter conserved in a chemical reaction? • What determines the properties of a solution? • How do plastics impact the environment? <p>Projects/Labs/Performance Tasks</p> <ul style="list-style-type: none"> • Chemical Reaction Lab 	<p>MS-PS1-2 MS-PS1-3 MS-PS1-5 MS-ETS1-3 MS-ETS2-2</p>	<p>Upon the completion of this unit, students will be able to formulate an answer to the big question: What are chemical reactions? Students will use the engineering design process, scientific design process, and cross-cutting concepts to explore the properties of matter, chemical reactions, nuclear processes, and energy in chemical processes and in everyday life. Students will be able to analyze properties of matter to determine if a chemical reaction has taken place. Students will be able to describe how synthetic materials are made from natural resources and how that has an impact of society. Students will also use models to explain the law of conservation of matter.</p>

Scope and Sequence

<ul style="list-style-type: none"> • Archimedes Takes a Bath • Acids, Bases, and Indicators Lab • How Much Plastic Do You Use in a Day? • Engineering for Good notebook 		
<p>MS-PS2 Reading/Video Resources</p> <ul style="list-style-type: none"> • Motion reading/video assignment • Motion vocabulary practice • Motion Quiz • Forces reading/video assignment • Forces vocabulary practice • Forces Quiz • Work and Machines reading/video assignment • Work and Machines vocabulary practice • Work and Machines Quiz <p>MS-PS3 Reading/Video Resources</p> <ul style="list-style-type: none"> • Electricity reading/video assignment • Electricity vocabulary practice • Electricity Quiz <p>Unit Discussions</p> <ul style="list-style-type: none"> • How do you describe the motion of an object? • How do objects react to forces? • How do machines make work easier? <p>Projects/Labs/Performance Tasks</p> <ul style="list-style-type: none"> • Identifying Motion Quick lab 	<p>MS-PS2-1 MS-PS2-2 MS-PS2-3 MS-PS2-4 MS-PS2-5 MS-PS3-1 MS-PS3-2</p>	<p>Upon the completion of this unit, students will be able to formulate an answer to the big question: How do objects affect other objects? Students will use the engineering design process, scientific design process, and cross-cutting concepts to explore forces and motion, types of interactions amongst objects, stability and instability in physical systems, and the relationship between energy and forces, the conservation of energy and energy transfer.</p>

Scope and Sequence

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| <ul style="list-style-type: none">• How Fast How Far Lab• Describing Acceleration Quick Lab• Balloon Rockets• How Close is It? Lab• Changing Load Lab• Force and Motion Interactive• Design a Toy Rocket• Dissipation of Energy Lab• Water Wheel Performance Assessment• Water Bottle Rockets• Kinetic Energy and Mass | | |
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