



# Wyoming Department of Education Required Virtual Education Course Syllabus

## Park County School District # 1

### Course Information

<b>Program Name</b>	Park #1 Online
<b>Course ID</b>	OL2330 B
<b>Course Name</b>	MS Physical Science B
<b>SCED Code</b>	03239G0.5022
<b>Content Area</b>	Science
<b>Grade Level</b>	6th, 7th, 8th
<b># of Credits</b>	0.5
<b>Curriculum Type</b>	District Developed
<b>Please give a concise description of this course including the purpose and what students will demonstrate and/or gain from this course.</b>	
<p><i>MS Physical Science offers middle school students the opportunity to learn about physical science phenomena through a three-dimensional approach. In Part B of this course, students will learn about: forces and motion, types of interactions, stability and instability in physical systems, conservation of energy and energy transfer, relationships between energy and forces, wave properties, electromagnetic radiation, and information technologies and instrumentation in congruence with developing engineering and experimental design practices enveloped within unifying crosscutting concepts.</i></p>	

### Wyoming Content and Performance Standards

<b>Standard</b>	<b><a href="#">BENCHMARK (Standard/Indicator) Use the Standards and Benchmarks as Spreadsheets</a></b>
MS-PS2-3	Ask questions to determine the factors that affect the strength of electric and magnetic forces.
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-PS3-5	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.
MS-PS4-1	Use mathematical representations to describe a simple model for waves, which includes how the amplitude of a wave is related to the energy in a wave.
MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

## Wyoming Content and Performance Standards

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-ETS1-1	Define criterial 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 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 Objectives/Student Centered Goals
<p><b>MS-PS3 Reading/Video Resources</b></p> <ul style="list-style-type: none"> <li>Magnetism and Electromagnetism reading/video assignment</li> <li>Magnetism and Electromagnetism vocabulary practice</li> <li>Magnetism and Electromagnetism Quiz</li> </ul> <p><b>Unit Discussions</b></p> <ul style="list-style-type: none"> <li>How are electricity and magnetism related?</li> </ul> <p><b>Projects/Labs/Performance Tasks</b></p>	<p>MS-PS2-3 MS-PS2-5 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 at a distance? Students will use the engineering design process, scientific design process, and cross-cutting concepts to explore types of interactions amongst objects, potential energy of objects, and the relationship between energy and forces. Students will be able to determine the factors that affect the strength of electric and magnetic forces. Students will be able to provide evidence showing field exist between objects that are not in direct contact with each other. Students will also be able to use models to describe how potential energy can be stored in a system and transferred when two objects interact with each other.</p>

## Scope and Sequence

<ul style="list-style-type: none"> <li>• Magnet Lab</li> <li>• The Strength of Electromagnetic Forces</li> <li>• Making an Electromagnet Lab</li> <li>• Gravitational Forces</li> <li>• Force Fields</li> </ul>		
<p><b>MS-PS4 Reading/Video Resources</b></p> <ul style="list-style-type: none"> <li>• Characteristics of Waves reading/video assignment</li> <li>• Characteristics of Waves vocabulary practice</li> <li>• Characteristics of Waves Quiz</li> <li>• Sound reading/video assignment</li> <li>• Sound vocabulary practice</li> <li>• Sound Quiz</li> <li>• Electromagnetic Waves reading/video assignment</li> <li>• Electromagnetic Waves vocabulary practice</li> <li>• Electromagnetic Waves Quiz</li> <li>• Light reading/video assignment</li> <li>• Light vocabulary practice</li> <li>• Light Quiz</li> </ul> <p><b>Unit Discussions</b></p> <ul style="list-style-type: none"> <li>• What are the properties of waves?</li> <li>• What determines the pitch and loudness of sound?</li> <li>• What kinds of electromagnetic waves make up the electromagnetic spectrum?</li> <li>• How does light interact with matter?</li> </ul>	<p>MS-PS4-1 MS-PS4-2 MS-PS4-3</p>	<p>Upon the completion of this unit, students will be able to formulate an answer to the big question: How do waves transfer energy and information? Students will use the engineering design process, scientific design process, and cross-cutting concepts to explore the properties of waves, electromagnetic radiation, and the reliability of digitized signals. Students will be able to describe a wave by its properties, describe how waves are transmitted, reflected or absorbed materials, and clarify how digitized signals are more reliable than analog signals.</p>

## Scope and Sequence

<p><b>Projects/Labs/Performance Tasks</b></p> <ul style="list-style-type: none"> <li>• Simple Model of Waves Web-Quest</li> <li>• Analog and Digital Signals</li> <li>• Waves and Mediums</li> <li>• Wave Characteristics</li> <li>• Experimenting with Reflection</li> </ul>		
<p><b>Projects/Labs/Performance Tasks</b></p> <ul style="list-style-type: none"> <li>• Engineering and Energy Expo (EEE)</li> </ul>	<p>MS-PS3-5 MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4</p>	<p>Upon the completion of this unit, students will be able to formulate an answer to the big question: What are the interrelated processes of engineering and experimental design? Students will create a project that demonstrates energy transfer through the use of Rube-Goldberg machines or through experimental design.</p>