

Mount Pleasant Central School District

7th Grade, Science



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Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
Engineering Design	September	- Engineering design	- Criteria - Constraints	MS-ETS1-1: Define the criteria 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.	- Use problem solving skills to solve an engineering design challenge.	Engineers work collaboratively to solve problems. Engineers must identify criteria, constraints, and test and evaluate designs in order to determine the optimal solution.	Project: Engineering Parachutes for Mars
Chemistry	September/ October	-Atom, Elements and Classification of Matter - Chemical Reactions	- Element -Physical/Chemical Changes - Chemical equations	MS-PS1-1: Develop models to describe the atomic composition of simple	- Use observations and lab skills to classify and separate the components of a	All matter is made of tiny particles, such as atoms and molecules. When atoms are	Lab: Mystery Powders Mini-Project: Element Superheroes

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			- Conservation of Mass	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-PS1-5: 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.	mixture. - Use observations and mathematical analysis to support a claim that chemical reactions obey the Law of Conservation of Mass	rearranged, new substances are created but matter is not destroyed.	NYS Lab: All Mixed Up CER: Conservation of Matter

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Biochemistry	November/ December	<ul style="list-style-type: none"> - Plant & Animal Cell organelles - Cellular Processes (Photosynthesis & Transport Across the Cell Membrane) 	<ul style="list-style-type: none"> - Cell - Organelles - Organic Compound - Diffusion - Photosynthesis 	<p>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.</p> <p>MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.</p> <p>MS-LS1-3. Use argument supported</p>	<ul style="list-style-type: none"> - Use a microscope to observe cell structure and classify living and nonliving things - Use observations and mathematical analysis to support a claim that light is necessary for photosynthesis 	<p>Within cells, special structures are responsible for particular functions.</p> <p>An organic compound is a carbon-based chemical compound.</p> <p>Molecules may or may not use energy to pass across the cell membrane.</p> <p>Photosynthesis is a chemical process that takes inorganic molecules and sunlight to create</p>	<p>Lab: It's Alive!</p> <p>Mini-Project: Cell Analogies</p> <p>Lab: Diffusion through a Membrane</p> <p>CER: Is light necessary for photosynthesis?</p>

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				<p>by evidence for how the body is a system of interacting subsystems composed of groups of cells.</p> <p>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.</p>		organic compounds.	
Alternatives to Fossil Fuels	December/ January	<ul style="list-style-type: none"> - Climate Change & Its Causes -Renewable & Nonrenewable Energy 	<ul style="list-style-type: none"> - Climate Change, -Fossil Fuels -Energy Sources -Electricity 	MS-ESS3-4. Construct an argument supported by evidence for how	- Use the Engineering Design Process to design an effective windmill	The greenhouse effect contributes to climate changes and all of the effects that we are	Engineering Design: The Most Effective Windmill

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				<p>increases in human population and per-capita consumption of natural resources impact Earth's systems.</p> <p>MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.</p> <p>MS-PS2-5. Conduct an investigation and evaluate the</p>	-Analyze and interpret data to determine the global impact of climate change	seeing on Earth. Humans can look to renewable energy sources as a way to lower their carbon footprint.	<p>Lab: The Greenhouse Effect</p> <p>Lab: Circuits</p>

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				experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. MS-ETS1-1. Define the criteria and constraints of a design problem			

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				<p>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.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the</p>			

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				<p>problem.</p> <p>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.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative</p>			

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				testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.			
Energy	January/February	<ul style="list-style-type: none"> - Potential & Kinetic Energy -Energy Transformations -Heat & Heat Transfer 	<ul style="list-style-type: none"> - Potential Energy, Kinetic Energy - Conservation of Energy -Thermal Energy -Energy Transfer 	<p>MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.</p> <p>MS-PS3-4. Plan an investigation to determine the relationships among</p>	- Use the Engineering Design Process to design an effective thermal insulator	<p>Energy is never created or destroyed; rather it is transformed.</p> <p>Heat transfers from “hot” to “cold” to reach equilibrium.</p>	<p>NYS Lab: Cool It!</p> <p>Lab: Ball & Ramp</p> <p>Mini-Project: Rube Goldberg Machines</p> <p>Engineering Design: The Most Effective Thermos</p>

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				<p>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</p> <p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and</p>			

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				<p>potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>MS-ETS1-3. Analyze data from tests to determine similarities and differences</p>			

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				<p>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.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be</p>			

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				achieved.			
Life on the Third Rock	March/April	<ul style="list-style-type: none"> - Earth's Motions & Seasons - Earth's Moon - Gravity & the Big Bang - Tides 	<ul style="list-style-type: none"> - Rotation, Revolution - Seasons - Moon phases - Eclipse - Gravity 	<p>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</p> <p>MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.</p> <p>MS-ESS1-3. Analyze</p>	<ul style="list-style-type: none"> - Create a model that shows the Sun and the planets of the Solar System to scale - Analyze and interpret data to make predictions about daily and seasonal changes on Earth. 	The motions of the Earth and Moon in relation to the Sun result in a variety of daily, seasonal, and annual changes on Earth.	<p>Lab: Reason for the Seasons</p> <p>Lab: Phases of the Moon</p> <p>Lab: Gravity & Tides</p> <p>Engineering Design: Pinhole Projector</p> <p>Mini-Project: Solar System to Scale</p>

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				<p>and interpret data to determine scale properties of objects in the solar system.</p> <p>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.</p>			
Waves	May/June	<ul style="list-style-type: none"> - Properties and patterns of Waves - Electromagnetic Spectrum 	<ul style="list-style-type: none"> - Wave - Parts of a Wave - Loudness, Pitch - Wave Behavior 	MS-PS4-1. Use mathematical representations to describe a simple	- Create a model that demonstrates the impacts of changing frequency and	Some waves require a medium, while others do not.	Engineering Design: Design a Sound Studio

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			-Electromagnetic Spectrum	<p>model for waves that includes how the amplitude of a wave is related to the energy in a wave.</p> <p>MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.</p> <p>MS-PS4-3. Integrate qualitative scientific and technical information to</p>	amplitude and sound and light waves.	<p>Changes in frequency, wavelength, and amplitude result in different colors, sounds, etc.</p> <p>Waves travel at different speeds through different media.</p>	Lab: Patterns in Waves

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				support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.			
		-	-		-		
		-	-		-		
		-	-		-		
		-	-		-		
		-	-		-		