

Middle School Grade 8 Physical Science - Energy	Links
Standard:	
MS-PS3- Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the 1. 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.	Link to NGSS Energy
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-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.	
21st Century Learning Expectations: <ul style="list-style-type: none"> • Hinsdale students will communicate through various means • Hinsdale students will be able to solve problems 	Link for 21st Century Learning Expectations
Enduring Understandings (cross cutting concepts): <ul style="list-style-type: none"> • Proportional relationships (e.g. speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes. MS-PS3-1, MS-PS3-4 • Models can be used to represent systems and their interactions – such as inputs, processes, and outputs – and energy and matter flows within systems. MS-PS3-2 • Energy may take different forms (e.g. energy in fields, thermal energy, energy of motion). MS-PS3-5 • The transfer of energy can be tracked as energy flows through a designed or natural system. MS-PS3-3 	

Learning Competencies (engineering practices)	Essential Questions (core ideas)
<p><i>Students will be able to: (NGSS Science and Engineering practices)</i></p> <ul style="list-style-type: none"> • Develop a model to describe unobservable mechanisms. MS-PS3-2 • Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. MS-PS3-4 • Construct and interpret graphical displays of data to identify linear and nonlinear relationships. MS-PS3-1 • Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. Link Click Here • Apply scientific ideas or principles to design, construct, and test a design of an object, tool, process or system. MS-PS3-3 • Construct, use, and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon. MS-PS3-5 	<ul style="list-style-type: none"> • What is energy? • How is science applied to energy? <p>Link to NGSS Energy</p>
<p>Performance Task Sample:</p> <p>NSTA Physics of Roller Coasters</p> <p>NSTA Save the Penguins</p>	

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