

K-5 Science
Missouri Learning Standards: Grade-Level Expectations

Missouri Department of Elementary and Secondary Education
Spring 2016

PS1 - Matter and Its Interactions						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
A	<p>K.PS1.A.1 Make qualitative observations of the physical properties of objects (i.e., size, shape, color, mass).</p> <p><i>MLS Connections:</i> <i>ELA - W.2.B, W.2.C, SL1.A, SL.3.A</i></p>		<p>2. PS1.A.1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]</p> <p><i>MLS Connections:</i> <i>ELA - W. 3.A</i></p>	<p>3.PS1.A.1 Predict and investigate that water can change from a liquid to a solid (freeze), and back again (melt), or from a liquid to a gas (evaporation), and back again (condensation) as the result of temperature changes.</p> <p><i>MLS Connections:</i> <i>ELA - W.3.A</i></p>		<p>5. PS1.A.1 Develop a model to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence supporting a model could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.]</p> <p><i>MLS Connections:</i> <i>ELA - 5.R.3.A.a, 5.R.3.A.c, 5.R.4.A.e</i></p>
			<p>2.PS1.A.2 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.]</p> <p><i>MLS Connections:</i> <i>ELA - R.1.A, W. 3.A</i></p>	<p>5. PS1.A.2 Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.[Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.]</p> <p><i>MLS Connections:</i> <i>ELA - W.3.A</i></p>		
Structure and Properties of Matter						

PS1 - Matter and Its Interactions						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
B				3.PS1.B.1 Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. <i>MLS Connections:</i> <i>ELA - W.3.A</i>		5. PS1.B.1 Plan and conduct investigations to separate the components of a mixture/solution by their physical properties (i.e., sorting, filtration, magnets, screening). <i>MLS Connections:</i> <i>ELA - W.3.A</i> 5. PS1.B.2 Conduct an investigation to determine whether the combining of two or more substances results in new substances. <i>MLS Connections:</i> <i>ELA - W.3.A</i>
Types of Interactions of Matter						

PS2 - Motion and Stability: Forces and Interactions						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
A	<p>K.PS2.A.1 Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.]</p> <p><i>MLS Connections:</i> <i>ELA - W.3.A</i></p>		<p>2.PS2.A.1 Analyze data to determine how the motion of an object changed by an applied force or the mass of an object.</p> <p><i>MLS Connections:</i> <i>ELA - W.3.A</i></p>		<p>4.PS2.A.1 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.</p> <p><i>MLS Connections:</i> <i>ELA - W.3.A</i></p>	
	<p>K.PS2.A.2 Describe ways to change the motion of an object (i.e., how to cause an object to go slower, go faster, go farther, change direction, stop).</p> <p><i>MLS Connections:</i> <i>ELA - W.R.3.C.a & K.SL.3.A.c</i></p>				<p>4.PS2.A.2 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.[Clarification Statement: Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all.]</p> <p><i>MLS Connections:</i> <i>ELA - 3.R.1.A.b, 3.R.1.D.a, W.3.A</i></p>	
Forces and Motion						

PS2 - Motion and Stability: Forces and Interactions						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
B				3.PS2.B.1 Plan and conduct investigations to determine the cause and effect relationship of electric or magnetic interactions between two objects not in contact with each other. [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.]	4.PS2.B.1 Plan and conduct a fair test to compare and contrast the forces (measured by a spring scale in Newtons) required to overcome friction when an object moves over different surfaces (i.e., rough/smooth). <i>MLS Connections:</i> <i>ELA - 4.R.3.A.b</i>	5. PS2.B.1 Support an argument that the gravitational force exerted by Earth on objects is directed toward the planet's center. [Clarification Statement: "Down" is a local description of the direction that points toward the center of the spherical Earth.] <i>MLS Connections:</i> <i>ELA - 5.R.1.A.a, 5.R.1.A.b, 5.R.3.C.b, 5.R.3.C.e, 5.R.1.C.a, 5.R.3.C.e, W.2.A</i>
				<i>MLS Connections:</i> <i>ELA - 3.R.1.A.b, 3.R.1.D.a, 3.R.2.A.f, 3.R.3.A.d, 3.R.3.A.e, 3.R.3.C.a, 3.R.3.C.b, 3.SL.1.A.b</i>	4.PS2.B.2 Predict how changes in either the amount of force applied to an object or the mass of the object affects the motion (speed and direction) of the object. <i>MLS Connections:</i> <i>ELA - 4.R.3.A.b</i>	
Types of Interaction						

PS3 - Energy						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
A	<p>K.PS3.A.1 Make observations to determine the effect of sunlight on Earth's surface.</p> <p><i>MLS Connections: ELA - W.3.A</i></p>	<p>1.PS3.A.1 Identify the source of energy that causes an increase in the temperature of an object (e.g., Sun, stove, flame, light bulb).</p> <p><i>MLS Connections: ELA - W.3.A</i></p>			<p>4.PS3.A.1 Use evidence to construct an explanation relating the speed of an object to the energy of that object.</p> <p><i>MLS Connections: ELA - 3.R.1.A.b, 4.R.1.A.a, 4.R.1.A.b, 4.R.3.B.b, 4.R.3.A.b, 4.R.3.C.b, 4.R.1.C.a, W.2.B, W.3.A</i></p>	
Definitions of Energy						

PS3 - Energy						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
B	<p>K.PS3.B.1 With prompting and support, use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area</p> <hr/> <p><i>MLS Connections: ELA - W.3.A</i></p>				<p>4.PS3.B.1 Provide evidence to construct an explanation of an energy transformation(e.g. temperature change, light, sound, motion, and magnetic effects)</p> <p><i>MLS Connections: ELA - W.3.A</i></p> <p>4.PS3.B.2 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. [Clarification Statement: Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device.]</p> <p><i>MLS Connections: ELA - W.3.A</i></p>	
	Conservation of Energy and Energy Transfer					

ESS3 - Earth and Human Activity						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
C						5. ESS3.Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. <i>MLS Connections:</i> <i>ELA - 5.R.1.A.a-b, 5.R.3.A.a-b, 5.R.4.A.e, 5.R.1.C.a, 5.R.3.C.e, 5.W.2.A.d, 5.W.2.B.e, 5.W.3.A.d, 5.W.3.A.e</i>
Human Impacts on Earth's Systems						

ETS1 - Engineering Design						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
A	K.ETS1.A.1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	1.ETS1.A.1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	2.ETS1.A.1 Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	3.ETS1.A.1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	4.ETS1.A.1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	5.ETS1.A.1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
	Defining and Delimiting Engineering Problems	<i>MLS Connections:</i> <i>ELA - R.1.D, W.1.D, W.3.A</i>	<i>MLS Connections:</i> <i>ELA - R.1.D, W.1.D, W.3.A</i>	<i>MLS Connections:</i> <i>ELA - R.1.D, W.1.D, W.3.A</i>	<i>MLS Connections:</i> <i>ELA - W.3.A, 3.W.2.B.d</i>	<i>MLS Connections:</i> <i>ELA - W.3.A, 4.W.2.A.d, 4.W.2.B.d</i>

ETS1 - Engineering Design						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
B	K.ETS1.B.1 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. <i>MLS Connections: ELA - 2.W.3.A.f</i>	1.ETS1.B.1 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. <i>MLS Connections: ELA - 2.W.3.A.f</i>	2.ETS1.B.1 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. <i>MLS Connections: ELA - 2.W.3.A.f</i>	3.ETS1.B.1 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. <i>MLS Connections: ELA - R.3.A, R.4.A, R.1.C, R.3.C</i>	4.ETS1.B.1 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. <i>MLS Connections: ELA - R.3.A, R.4.A, R.1.C, R.3.C</i>	5.ETS1.B.1 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. <i>MLS Connections: ELA - 5.R.1.A.a-b, 5.R.3.A.a, 5.R.3.A.c, 5.R.4.A.e, 5.R.1.C.a, 5.R.3.C.e</i>

ETS1 - Engineering Design						
	Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
C	K.ETS1.C.1 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	1.ETS1.C.1 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	2.ETS1.C.1 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	3.ETS1.C.1 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	4.ETS1.C.1 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	5.ETS1.C.1 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
Optimizing the Solution Process	<i>MLS Connections: ELA - W.1.D, 2.W.3.A.c, 2.W.3.A.d, 2.W.3.A.e</i>	<i>MLS Connections: ELA - W.1.D, 2.W.3.A.c, 2.W.3.A.d, 2.W.3.A.e</i>	<i>MLS Connections: ELA - W.1.D, 2.W.3.A.c, 2.W.3.A.d, 2.W.3.A.e</i>	<i>MLS Connections: ELA - W.3.A, 3.W.2.B.d</i>	<i>MLS Connections: ELA - W.3.A, 4.W.2.A.d, 4.W.2.B.d</i>	<i>MLS Connections: ELA - W.3.A, 5.W.2.A.d, 5.W.2.B.e, 5.W.3.A.d, 5.W.3.A.e, 5.W.3.A.g, 5.W.3.A.g</i>