Big Idea: What is the relationship between the speed of an object and the energy of that object?
Guiding Question: Part A: What is the relationship between the speed of an object and its energy?
Part B: In what ways does energy change when objects collide?

Folder with AdditionaL Resources

DCI (Disciplinary Core Ideas)	*Science and Engineering Practices*	*Cross Cutting Concepts*	*Student Learning Objectives*	*Differentiated Activities (Consider the 5 Es)*	*Resources/Technology*	*Formative Assessments*	*Benchmark Assessment*
PS3.A: Definitions of Energy •The faster a given object is moving, the more energy it possesses. (4-PS3-1) •Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-3)	Constructing Explanations and Designing Solutions •Use evidence (e.g., measurements, observations, patterns) to construct an explanation. (4-PS3-1) Asking Questions and Defining Problems •Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (4-PS3-3)	**Energy and Matter** **•Energy can be transferred in various ways and between objects. (4-PS3-1) (4-PS3-3)**	*1. SWBAT/ WALT: Identify how energy can be transferred in various ways and between objects.* *1. Determine how the speed and energy of an object are related* *1. Observe how energy can be moved from place to place by moving objects or through sound, light, or electric currents.* *1. Utilize evidence to construct an explination on how the speed and energy of an object are related* *1. Reocgnize how energy is present whenever there are moving objects, sound, light, or heat.* *1. Recognize that when objects collide, energy can be transferred from one object to another, changing their motion.* *1. Recognize cause and effect relationships between air and sound* *1. Recognize that when objects collide energy transfers and changes objects' motions*	*List Activities and hyperlink them, if available.*	*List and hyperlink Resources.*	*List and hyperlink Formative Assessments, if available.*	*List and hyperlink Benchmark Assessments, if available.* *https://drive.google.com/drive/folders/0BwN-68EOlIUFckRWRmxvSXp5aHc* *Google Drive: Grade 4 Resources - Energy and Motion* *** project and or test*
	Planning and Carrying Out Investigations *•Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (4-PS3-2)*			Same link Slides 64-70 79-89	https://njctl.org/courses/science/4th-grade-science/energy/attachments/energy-3/ Slides 64-70 79-89	Student led discussion of how energy can be transferred between objects **Teachers can keep a class checklist ro holistically score student responses and comments Evidence recorded on graphic organizers explaining the relatonship between the speed and the energy of an object	
				Use links in activities boxes as well	http://www.mccracken.kyschools.us/Downloads/4%20NGSS%20UNIT%20Energy%20Waves.pdf	Recorded observations on graphic organizers or exit tickets Constructed explinations recorded on graphic organizers or exit slips (group, partner, or individual work)	

				Use links in activities boxes as well	http://www.bozemanscience.com/ngs-ps3c-relationship-between-energy-and-forces	Utilize lab activities to generate questions to gage critical thinking Have students orally respond to questions, or record responses in science notebooks	
Energy and Energy Transfer •Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (4-PS3-3)	Asking Questions and Defining Problems •Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (4-PS3-3)	Cause and Effect •Cause and effect relationships are routinely identified. (4-PS4-2)			http://www.bozemanscience.com/ngs-ps2a-forces-motions	I have... who has cause and effect card game	
	Planning and Carrying Out Investigations •Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (4-PS3-2)						
PS3.C: Relationship Between Energy and Forces •When objects collide, the contact forces transfer energy so as to change the objects' motions. (4-PS3-3)	Asking Questions and Defining Problems •Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. (4-PS3-3)					Mirrors and refraction https://njctl.org/courses/science/4th-grade-science/waves-light-information/attachments/waves-light-information-quizzes/	
	Planning and Carrying Out Investigations •Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (4-PS3-2)					Light Reflection Lab https://njctl.org/courses/science/4th-grade-science/waves-light-information/attachments/light-reflection-lab-teacher-notes/	