SCILLSS Classroom Science Assessment Workshop

# Middle School Sample Task Ideas

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| **NGSS PE: MS-PS3-1.** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. |

# Example Task Ideas

1. Construct graphical displays to organize given data such as the mass, speed, and kinetic energy in a way that would make interpretation possible.
2. Given a graphical display, identify that kinetic energy increases if either the mass or the speed of the object increases or if both increase.
3. Given a graphical display, identify that kinetic energy decreases if either the mass or the speed of the object decreases or if both decrease.
4. Make a prediction of the proportional relationships of kinetic energy.
5. Students use evidence to explain the difference between kinetic (motion) energy and potential (stored) energy.
6. Students analyze and interpret data to prove that kinetic energy is proportional to the mass of a moving object.
7. Students use models to demonstrate the amount of potential energy an object has is dependent on their relative positions.
8. Students analyze and interpret data to verify that the proportionality of kinetic energy increases with the square of its speed.

# Possible Phenomena

1. Kinetic energy of objects of different mass on top of a ramp
2. Kinetic energy of objects in free fall
3. Damage done by objects of different masses moving at the same speed
4. Damage done by objects of the same mass moving at different speeds
5. Distance traveled after objects of different masses roll down a ramp, fired from a cannon, or some other source of kinetic energy
6. Measurement of an objects speed and associated kinetic energy as the object moves along a path

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