

Energy Transfer: Scope and Sequence

Lesson Number	Focus Question(s)	Main Learning Goal	Science Content Storyline
1 a/b	How do we know whether something has energy?	Seeing objects move, hearing a sound, feeling heat, and seeing light are all ways of detecting energy.	Energy is all around us, and we can detect it using our senses. We can see objects moving, feel heat, hear sound, and see light. All of this is evidence that energy is present.
2 a/b	What causes a moving object to have more or less motion energy?	When an object moves faster, it has more energy.	Energy is all around us, and we can detect it with our senses. Objects in motion have energy. A marble rolls faster down a higher ramp than a lower ramp of the same length. When a faster-moving marble rolls down a higher ramp and collides with an object at the bottom, it will push that object farther than it would if it rolled down a lower ramp at a slower speed. Therefore, the faster-moving marble has more energy.
3a	What happens to energy when objects collide?	Energy can move or transfer from object to object.	Objects in motion have energy. When an object moves faster, it has more energy. Energy is transferred from one object to another during a collision. This results in a change of speed in both objects after the collision. These energy transfers can be illustrated in a diagram.
3b	What happens to energy when objects collide?	Energy can move or transfer from object to object.	Objects in motion have energy. Motion energy is called <i>kinetic energy</i> . When an object moves faster, it has more kinetic energy. Energy is transferred from one object to another during a collision. This results in a change of speed in both objects after the collision. These energy transfers can be illustrated in a diagram.
4a/b	Where does the energy of a moving object come from?	Energy can change, or transform, from potential energy to kinetic energy.	Energy moves from place to place and can transfer from object to object during a collision. Some forms of energy, such as potential energy, can't be detected in the same way kinetic energy is detected. Objects above the ground (such as at the top of a hill) have potential energy. Potential energy can change or transform into detectable kinetic energy.

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5a	Where does energy come from? Where does it go?	Energy is never created or destroyed, but it can undergo many changes.	Energy moves place to place or from object to object. We can detect energy in different ways. As energy moves and changes, it isn't destroyed or lost. It may be detected differently, but new energy isn't created. An energy-flow diagram can track the energy transfers and transformations that occur in interactions.
5b	Where does energy come from? Where does it go?	Energy is never created or destroyed, but it can undergo many changes.	Energy moves from place to place or from object to object. We can detect energy in different ways. As energy moves and changes, it isn't destroyed or lost. It may be detected differently, but new energy isn't created. An energy-flow diagram can track the energy transfers and transformations that occur in interactions. Ultimately, all energy transformations result in energy changing to heat, which either leaves Earth's system or is reflected back to Earth.
6a/b	How can knowing about energy help us solve problems?	Energy is transferred and transformed but not created or destroyed.	Energy can move and change, but it can't be created or destroyed. Energy transfers and transformations occur in all interactions and can be useful for building devices. Energy transfers away from a system through sound, light, or heat.