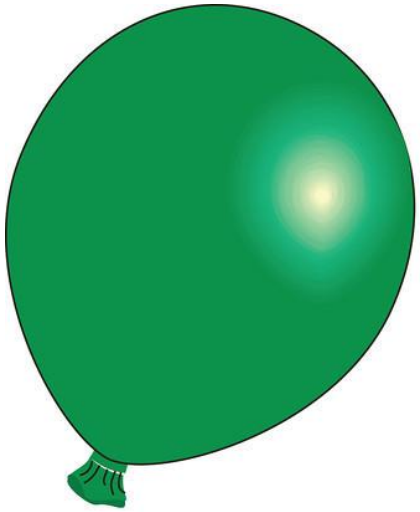
DE Science Middle School

Energy and Work

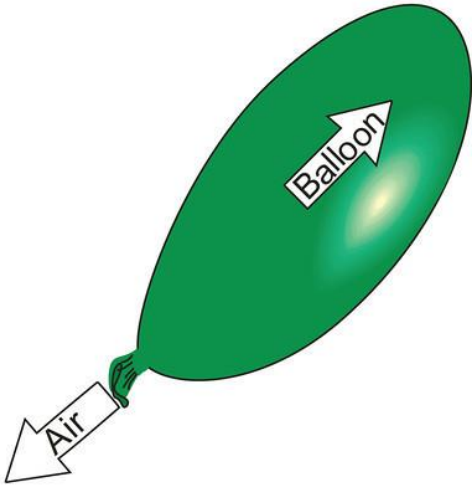
Potential and Kinetic Energy

Potential and Kinetic Energy—The Key Ideas

- Energy is the ability to do work, or move an object from one position to another. All forms of energy can be considered to fall into two categories—kinetic energy and potential energy.



Potential Energy



Kinetic Energy

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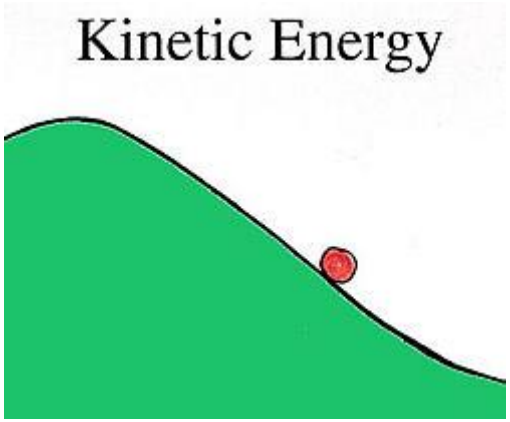
Kinetic Energy

- Kinetic energy is the energy possessed by an object due to its motion. Kinetic energy exists on many scales. Forms of kinetic energy include heat, electricity ,sound and the motion of objects and many other forms.



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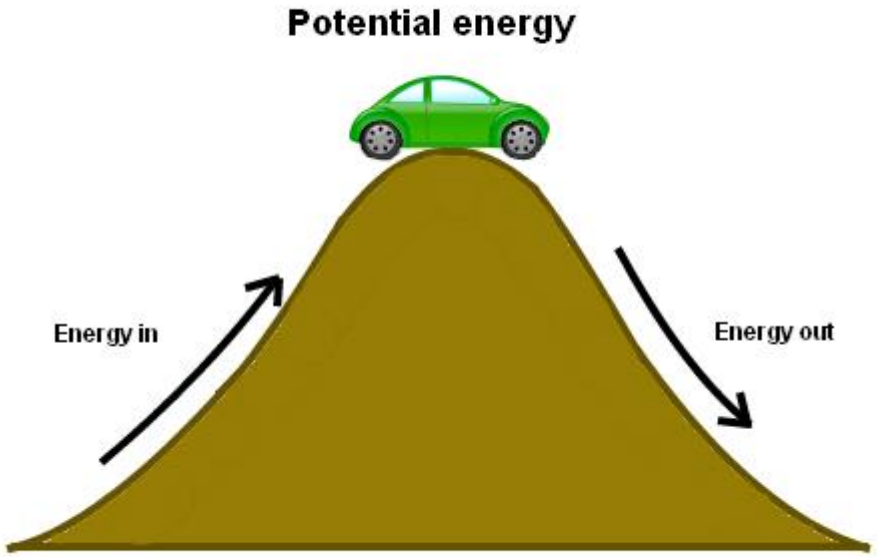
Potential and Kinetic Energy—The Key Ideas

- Potential energy is the energy possessed by an object due to its position, internal structure, or chemical composition. Potential energy can be thought of as energy that is stored until it can be converted into some form of kinetic energy. Like kinetic energy, potential energy can take many different forms. These include gravitational, chemical, nuclear, elastic, and electric potential energy.



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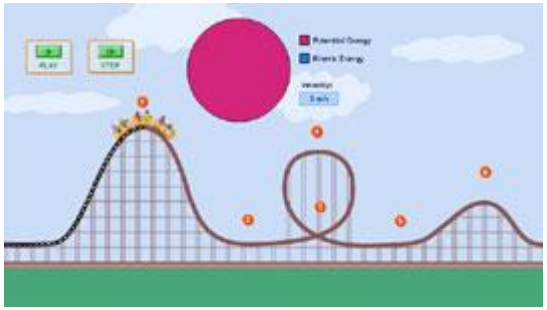
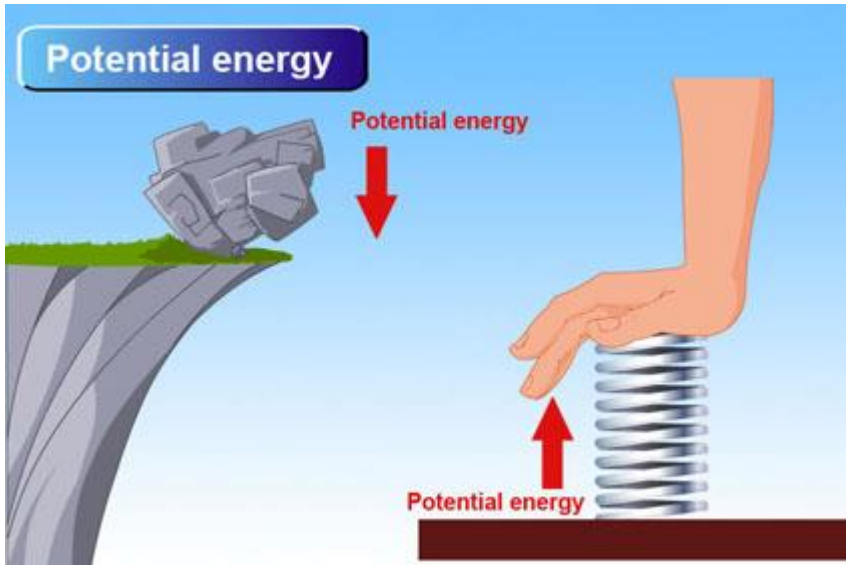
Potential and Kinetic Energy—Common Misconceptions

- All energy is kinetic energy.
  - **Reality:** There are two main classes of energy—kinetic and potential. Potential energy is the energy an object has due to its position, structure, or chemical composition.



Potential and Kinetic Energy—Common Misconceptions

- Objects that are not moving possess no energy.
  - **Reality:** All objects possess energy. For example, a rock lying on the ground contains a certain amount of heat energy, the kinetic energy of the molecules that make up the rock.



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Potential and Kinetic Energy—Common Misconceptions

- Gravity provides the only source of potential energy.
  - **Reality:** There are several different forms potential energy, including chemical, nuclear, elastic, and electric energy.

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Potential and Kinetic Energy—Common Misconceptions

- Kinetic energy only depends on speed.
  - **Reality:** Kinetic energy also depends on an object's mass. If two objects of different masses are traveling at the same speed, the more massive object will have more kinetic energy than the object with less mass.

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Potential and Kinetic Energy—Common Misconceptions

- Energy can be “lost” or used up.
  - **Reality:** Energy can neither be created nor destroyed. It merely changes from one form to another. When we say that energy is “lost” during an energy transformation, what we really mean is that some of the energy is converted into heat, which is dissipated into the surroundings.

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Potential and Kinetic Energy—Using DE Science Content

Use the PowerPoint version of this presentation for hyperlinks to these resources, or you can get to them through the browser or search feature.

- Video Segment: **Kinetic Energy**
- Video Segment: **The Kinetic-Molecular Theory**
- Video Segment: **Kinetic Energy: The Energy of Motion**
- Reading Passage: **An Exploration of Energy**
- Reading Passage: **Potential Energy**
- Reading Passage: **Kinetic Energy**

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Potential and Kinetic Energy—Instructional Ideas

- Have students view the video segment **Trampoline**. Have them predict the effects of changing the mass of the person or height of the jump on kinetic and potential energy. Next, have students perform the Exploration **Moving On**, then revisit their predictions.
- Have students read **Journal: The Movement in My Day**, then make a list of the different forms of kinetic and potential energy they have encountered during the course of their day.

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State Standards

If you wish to review your state standards regarding *Potential and Kinetic Energy*, click here to get to the curriculum standards search feature of DES.

http://search.discoveryeducation.com/CurriculumStandardLookup.cfm

You can click on any standard to see what resources are available for you to use.

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