Potential Energy

How does the term potential relate to energy? Potential is defined as the capacity to become something in the future. When we use the word to discuss energy, we're referring to an object's potential to release energy. Energy is the ability to do work. In this case, work doesn't mean doing a job. In the context of energy, work refers to a force that causes displacement or movement. So, if an object has potential energy, the object has the potential to do work or move.

There are two main types of potential energy: potential energy from position and potential energy from chemical composition.

When we refer to potential energy from position, we mean that objects in certain positions are storing energy. For example, if you pull back on a swing, the swing stores energy. When you let go, the swing releases its energy. There are two types of potential energy from position: gravitational energy and elastic energy.

How does simply lifting something give it energy? Earth has a gravitational force. In other words, the mass of Earth attracts other objects, including people—gravity is the reason we stay rooted to the ground! When you lift something up, Earth's gravity is still working on the object, but the object is farther away from Earth's surface. The higher you lift the object, the greater its gravitational potential energy.

The mass of an object also plays a role in determining gravitational potential energy. The greater the mass of an object you lift, the greater the potential energy.

Potential energy from position can also result from stretching or compressing something. This is known as elastic potential energy. For example, when a bow is slack it does not have stored energy. In order for an arrow to fly, the archer must stretch the bowstring. Stretching the bowstring increases its potential energy. When the archer lets go of the bowstring, the arrow goes flying because energy is released. The more an object is stretched, the greater the stored energy.

Potential energy can also be stored based on the chemical composition of the object. For example, many living or once-living things have stored energy from the sun. Fossil fuels, like coal or oil, are one example of this process. Gasoline contains potential energy stored from the ancient plants and animals that formed petroleum over millions of years. When we burn gas, the stored energy we release can be used to move objects. Our cars couldn't move without a source of energy.

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Answer the following questions IN COMPLETE SENTENCES as you are reading.

1. What is the definition of potential?

2. What does work refer to?

3. What are the two main types of potential energy?

4. Explain potential energy from position.

5. Explain how gravity affects potential energy.

6. How does mass play a role in potential energy?

7. Give one example of elastic potential energy and one example of chemical potential energy.