

What is energy?



Ball bounce data table

Trial	Height small	Height big	
50 cm 1			
2			
3			Small big
			Average:
100 cm 1			
2			
3			Small big
			Average:

Discover Activity

How high does a ball bounce



1. Hold a meter stick vertically, with the zero end on the ground.
2. Drop the ball from the 50-cm mark and record the height to which it bounces.
3. Repeat step 2 two more times.
4. Drop the from the 100-cm mark and record the height to which it bounces.
5. Repeat step 4 two more times.
6. **Think it over: How does the height from which you drop the ball relate to the height to which the ball bounces?**

Ball bounce conclusion:

The ball bounces the highest when:

The greater the height from which the ball is dropped, the
_____ the ball bounces.

Bouncy ball slow motion



Energy, Work, and Power

*Recall that work is done when a force moves an object through a distance.

The ability to do work or cause change is called energy.

When an object or living thing does work on another object, some of its energy is transferred to that object. You can think of work, then, as the transfer of energy. When energy is transferred, the object upon which the work is done gains energy. Energy is measured in joules- the same units as work.



Power is involved whenever energy is being transferred. For example, a calm breeze's power is its rate of energy transfer to lift a leaf a certain distance.

A tornado transfers the same amount of energy when it lifts the leaf the same distance. However, the tornado has a **greater power** than the breeze because it transfers energy to the leaf in less time.



Think about it:

If a handsaw does the same amount of work on a log as a chainsaw does, which has a greater power? Why?



Energy

Two basic kinds of energy:

1. Kinetic energy: the energy an object has due to its motion.

The word *kinetic* comes from the Greek word *kinetos*, which means “moving”.

The kinetic energy of an object depends on both its mass and velocity.

Kinetic energy increases as mass increases and when velocity increases.

$$\text{Kinetic energy} = \frac{1}{2} \times \text{Mass} \times \text{Velocity}^2$$

Changing the velocity of an object will have a greater effect on its kinetic energy than changing its mass by the same factor. Ex: doubling the mass of an object will double its kinetic energy. Doubling its velocity will quadruple its kinetic energy.

Brain pop on Kinetic energy

If needed:

Username: kms768

Password: brainpop

2. Potential energy: stored energy that results from the position or shape of an object. This type of energy has the potential to do work.

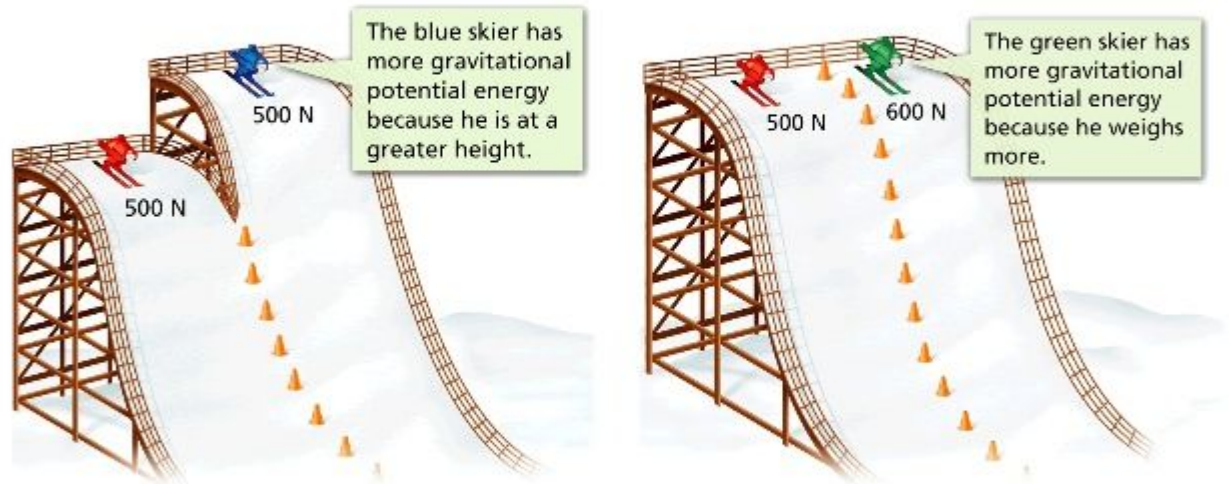
An object does not have to be moving to have energy.

Whether energy is kinetic or potential depends on whether an object is moving or not.

Gravitational potential energy: potential energy related to an object's height.

Gravitational potential energy = Weight x Height

... *Gravitational:* is related to an object's mass and height from the ground.



Elastic potential energy: The potential energy associated with objects that can be stretched or compressed.





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