

Catapulting Energy

<u>Materials</u>	<u>Amt/student</u>
Tongue Depressors	9
Mini Marshmallows	To taste
Rubber Bands	6
Plastics Spoon	1

Energy exists in everything around us in various forms such as kinetic, potential, electrical, thermal, or solar. There is nothing on the surface of the earth that really doesn't have some form of energy in it. We will be discussing what Energy is, and the two most encountered forms: **Kinetic Energy** and **Potential Energy**. These two forms of energy will be analyzed through the creation of a catapult.

Discussion:

What is energy?

Energy is the ability to do work. It can't be created or destroyed.

There are two types of energy – Kinetic and potential energy.

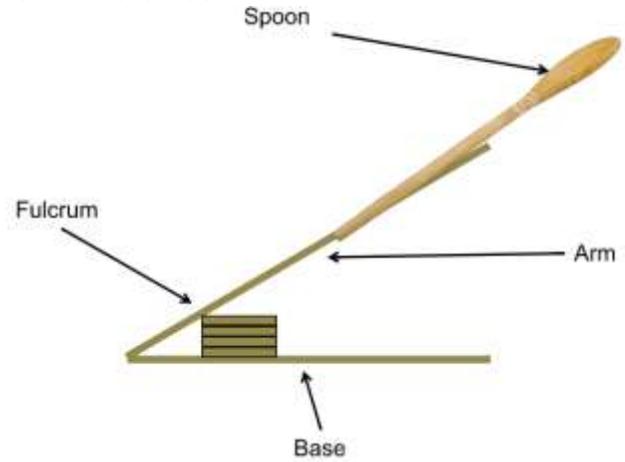
Kinetic energy is related to motion and speed. A moving object has a lot of kinetic energy. In contrast, potential energy is energy that is stored. It is related to position or orientation. For instance, a compressed spring has much potential energy. A deflected spring has kinetic energy!

What makes potential energy change to kinetic energy?

Remember, energy cannot be created or destroyed. It can, however, be transformed from one type to another, like potential energy to kinetic energy! For instance, when a roller coaster car is at the very top of a rollercoaster, it has great potential energy because it is at a high **position**. As the car falls down the slope of a rollercoaster, that potential energy is converted into kinetic energy, the energy of **motion and speed!**

Today we will make catapults to demonstrate this energy conversion.

When you bend the arm of a catapult, you add potential energy to the arm – it's stored energy, or **ability** to do work in the "pulled-back" position. When you release the bent arm, all potential energy is converted to kinetic energy!
- Energy is neither created nor destroyed, just transferred.



Procedure:

1. Stack 7 depressors and tie them with two rubber bands on each end as tight as you can
2. Stack two depressors and tie one end with a rubber band as tight as you can (space it about .5" from the end)
3. Spread the two depressors from step two and place the stack from step 1 at the end with the rubber band, creating V shape as shown in the figure on the previous page
4. Using another rubber band attach the assembly at the fulcrum without interfering with the lever arm.
5. Attach the spoon to the arm using the last two rubber bands
 - a. Place the spoon so the head is about an inch away from the end of the arm
6. Place a marshmallow in the spoon, pull it back, and watch it fly!
7. Try moving the spoon up or down the arm and see how much energy you can store with a longer arm (Hint, the longer the arm allows for more bending, which means more storage of potential energy)