

Energy as a Crosscutting Concept Transcript
Video 1 in Energy Transfers Around a Kangaroo Rat
Asombro Institute for Science Education

Hi everybody, this is Kelly with the Asombro Institute here to talk about the science of the desert with you.

Today we're going to be talking about energy and energy transfers. This video will review types of energy, and look at how energy moves through both living and non-living systems.

Energy is a cross-cutting concept in science, which means that it will be an important part of every science concept you learn about throughout your life.

You already know a lot about energy. It's the ability to make things move or change, and you use it every day in several forms. What's one way you've used energy today? (Students answer this question in Edpuzzle)

Where does the energy that keeps the earth warm come from? (Students answer this question in Edpuzzle)

There are two categories of energy: potential and kinetic. Potential energy is stored energy, or energy that can be used. Kinetic energy is energy in motion, or energy that's being used.

Let's take a look at this example of a roller coaster. When the roller coaster is at the top of the hill, what kind of energy does it have? (Students answer this question in Edpuzzle)

When the roller coaster is moving, what kind of energy does it have? (Students answer this question in Edpuzzle)

We can identify specific types of potential and kinetic energy. Chemical, gravitational, and elastic are all types of potential energy. Chemical energy is stored in the chemical bonds of a molecule. When we eat an apple, our body breaks down the chemical bonds - releasing energy we can use. Gravitational potential energy is caused by something having a position above the earth, like this cup sitting on the table. A slinky can show us elastic energy. When we stretch it, it holds elastic potential energy that is released when we let go.

When objects, molecules, and waves move we call it kinetic energy. We call objects that are moving motion energy. There's also thermal or heat, light, sound, and electrical energy.

There are many types of energy, but because they're all energy, they can all be transformed into other types of energy.

We can track the transformation of energy. For example, this ball has gravitational potential energy because I'm holding it up. When I release it, the gravitational energy transforms into motion because the ball is moving. [ball bouncing]

Some of the energy is also transformed into sound when you hear the ball bounce. This ball is a small system. We put energy into it, and then we watched and heard it leave. But the energy didn't just disappear. It was transformed into different types of energy. Energy is conserved, which means that it cannot be created or destroyed.

But we can also track energy in larger systems. Here's another example. Light from the sun shines onto this plant. Chloroplasts in the plant's cells use light energy to make glucose, a form of sugar which stores chemical energy.

In this video, we've identified types of energy and tracked it through both living and non-living systems. In the next video, we'll be looking at kangaroo rats and the energy transfers that happen as they interact with their environment in the Chihuahuan desert ecosystem. So select the next video to learn more about these guys, and I'll see you there!