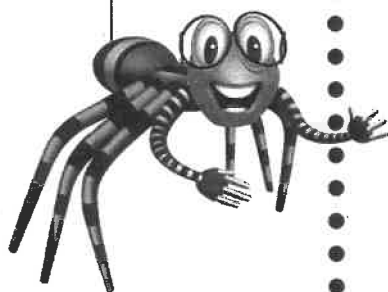


LESSON 1

What is Energy?

► Play Video: Introduction



How do we
use energy?

New Vocabulary

chemical energy the energy stored in molecules

electrical energy the movement of electrons

energy the ability to do work

kinetic energy the energy of motion

potential energy stored energy

thermal energy the energy of heat

Soon You'll Know

Main Ideas

1. What some of the many different forms of energy are
2. What potential energy is and what happens to it
3. What happens when energy changes forms

► Play Video A: Forms of Energy

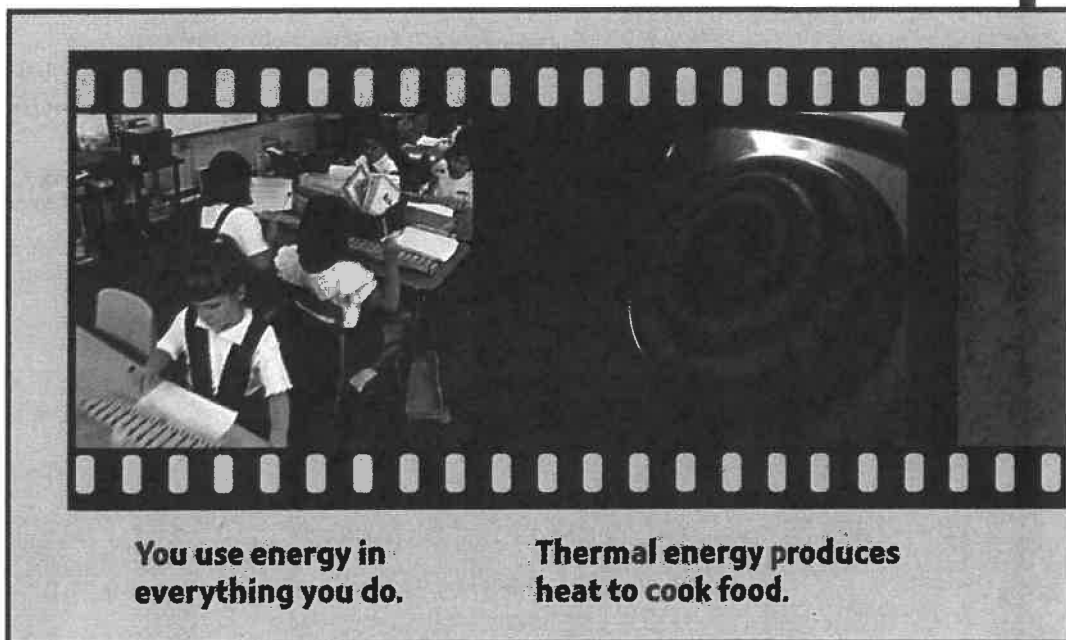
Remember In the video you learned about energy. Just like ice cream, there are many different kinds, including nuclear energy and even radiant energy from the sun!

Think about it As you know by now, if you want to get some work done, you have to use a little **energy**. It doesn't matter if you're moving some dirt or digesting your food, you are using energy. Lucky for us, energy comes in many forms.

Stored Energy

Food stores **chemical energy** that our bodies use. Batteries also store chemical energy. When the chemicals in batteries react, they produce electrons. The movement of these electrons produces **electrical energy**, which can power things like lights and CD players. Electrical energy can be transferred into mechanical energy to move an elevator. Electrical energy can also be transferred into the mechanical energy of vibrations. And you know that vibrating objects produce sound.

Another form of energy that you are very familiar with is **thermal energy**. When atoms and molecules move very quickly, they produce thermal energy. The transfer of thermal energy from one object to another is what we know as heat.



Now You Know

Main Idea 1: Forms of Energy

Energy comes in many forms: mechanical, radiant, electrical, nuclear, thermal, and chemical.

► Play Video B: Potential Energy

Remember In the video you learned about potential and kinetic energy. No matter what form it is in, energy is either stored or used, depending on what's going on.

Think about it You already know there are many different forms of energy. But that's not the whole story. All of these forms of energy are grouped either as kinetic energy or potential energy.

Two Forms of Energy

Kinetic energy is the energy of motion. A bird flying in the sky or a car whizzing by on the road has kinetic energy. So does thermal energy, because it is produced when atoms and molecules move.

Another example of kinetic energy can be found in the mechanical movement of gears. When you ride your bike down the street, your bike and all the moving gears have kinetic energy.

The other form of energy is called potential energy. **Potential energy** is stored energy. A rock balanced on a cliff has potential energy. But if the rock starts to roll, the potential energy is converted to kinetic energy. When that rock stops on the next ledge, its kinetic energy is changed back to potential, or stored, energy again.



You always have energy, even when you feel tired.



Kinetic energy is the energy of motion.



A rock on top of a hill has potential energy.

Now You Know

Main Idea 2: Potential Energy

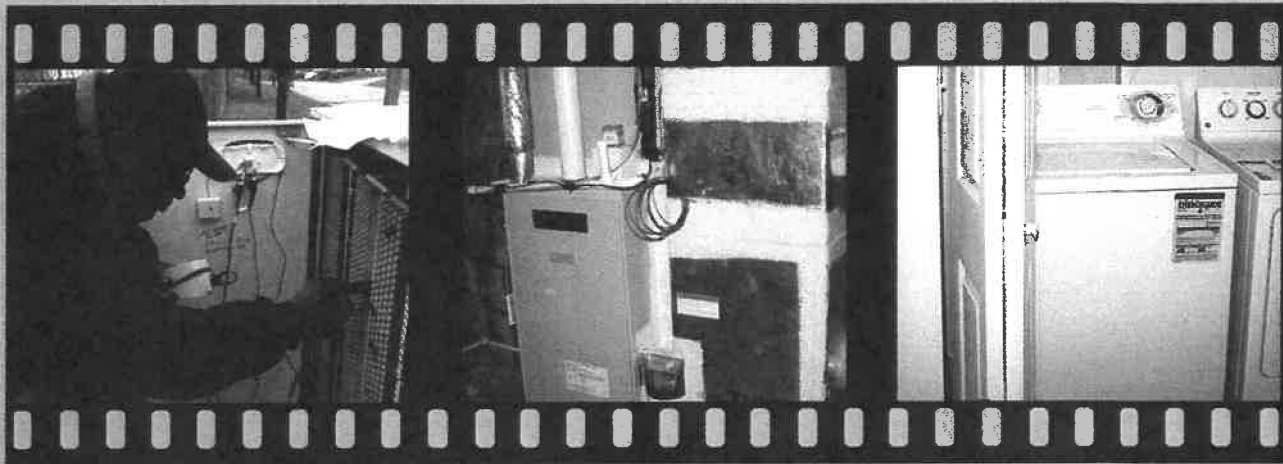
All forms of energy are either kinetic or potential energy.

► Play Video C: Conservation of Energy

Remember In the video you learned more about energy. It can change forms, but it never really goes away!

Think about it *Energy cannot be created or destroyed!*

This might sound like the beginning of a science fiction movie featuring a monster named “Energy.” But it’s not part of a movie at all—it’s true. Energy changes form all the time, but energy is not produced and energy is not destroyed.



This person is using energy to do work.

The wise use of energy can help reduce pollution in the environment.

Understanding how energy changes form helps us to use it more efficiently. If most of the thermal energy produced by a furnace can be captured and used to heat a home, then that means fewer fossil fuels are burned to supply energy to the furnace in the first place. Fewer burning fossil fuels means less pollution. This results in a cleaner environment—all because of the wise use of energy!

Now You Know

Main Idea 3: Conservation of Energy

Energy can change forms. However, energy cannot be created or destroyed.