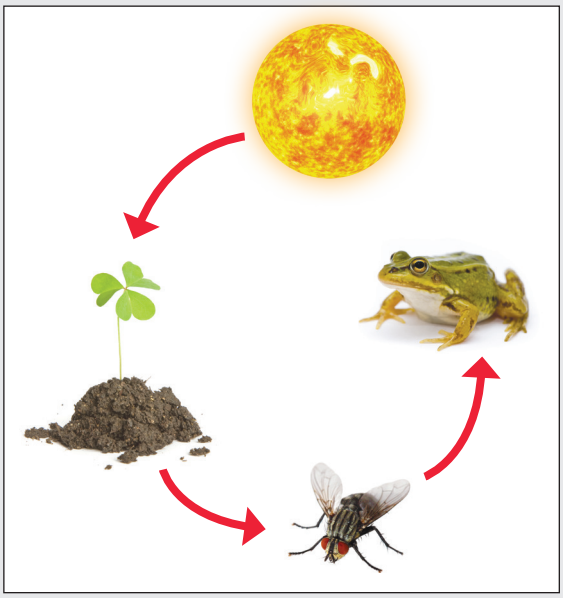
NAME: _____

Energy

Energy is like happiness. It's hard to say what it is, but you know when you've got it. People say that energy is what you need to change things. But let's wait until we have looked at all the kinds of energy. That is the best way to get a feel for what energy is.

We need a lot of energy here on Earth. We need energy to get up in the morning. We need it to cook breakfast. We need it to travel to school. You may be surprised to learn that almost all of the energy we use came from just one place—the Sun! The Sun sends energy to Earth in the form of **light energy**.

These are called solar cells. The Sun beats down on them. They take in energy from the Sun. They change this into electricity.



The plant stores energy from the sun. The bug gets energy when it eats the plant. The frog gets energy when it eats the bug.

When light energy meets the ground, some of it changes into **heat energy**. That is how Earth stays warm enough for us to live here. Some of the light energy is also changed into **food energy** by green plants. This is a kind of **stored energy**. It is stored in plants until we eat them. Then, we have energy to do things. If we eat meat, the energy we get comes from what is stored in the animal. The animal got it from eating plants.

NAME: _____

Light and Sound

3. Answer the questions in full sentences.

a) Someone hits a bell and it rings. Explain how you hear the ringing from across the room.

_____

_____

b) Explain what happens to light when it meets each of these things: a window, a mirror, a yellow shirt.

_____

_____

Extension & Application

4. Get into groups and use the graphic organizer on page 23. Show how kinds of waves are the same and how they are different. Use the internet to help you.

Make small models of each type with your group. Describe your models below.

a) Water: _____

_____

b) Sound: _____

_____

c) Light: _____

_____

Measuring the Speed of Sound and Distance of Lightning

Speed of Sound:

Have you heard an echo? We hear an echo when sound bounces off something in the distance. Work with a friend. This is what you will need:

- A stopwatch.
- Something tall, hard, and flat near a big empty space. The tall flat thing could be a wall of your school. The empty space could be a playing field.
- A tape measure or meter stick to measure the distance to the wall.
- Two flat, smooth blocks of wood about the size of bricks.

This is what you do:

- Clap the blocks together and listen for the echo.
- One person will clap the blocks. The other person will measure the time from the clap to the echo.
- Find the speed of sound. (Distance there and back ÷ Time)

How Far Away Was the Lightning?

If the echo study is hard to do, try this. In this study you will find out how far away a lightning bolt struck. This is what you will need:

- A stopwatch.
- A thunderstorm.
- A dry, safe place to watch the storm.

The light from a lightning bolt travels very fast. It is too fast to measure easily. For this study, you can pretend that the light took no time at all to get to you. The thunderclap happens at the same time as the lightning. The sound takes longer to reach you—long enough to measure the time. It takes the sound of thunder about 5 seconds to travel 1 mile (1.6 km). This is what you do:

1. Hold the stopwatch, and be ready to click it.
2. When you see a lightning flash, click the watch button.
3. When you hear the thunder, click it again. The time on the watch will be how long it took the sound to reach you.