



Essential Question

What Are Some Heat Sources?

Engage Your Brain!

Find the answer to the following question in this lesson and record it here.

The brakes on a car rub against the wheels to stop the car. But why are this car's brakes bright orange?

Active Reading

Lesson Vocabulary

List the terms. As you learn about each one, make notes in the Interactive Glossary.

Main Idea

The main idea of a section is the most important idea. The main idea may be stated in the first sentence, or it may be stated elsewhere. Active readers look for main ideas by asking themselves, What is this section mostly about?

Sharing the Warmth

Here are two common words: heat and temperature. You hear them every day. But what do they really mean?

Active Reading As you read these two pages, circle the clue word or phrase that signals a detail such as an example or an added fact.

Scientists use words very carefully. Some common words have special meanings in science. For example, when you use the word *heat*, you might mean how warm something is. In science, **heat** is energy that moves from warmer objects to cooler objects.

The temperature of the water in these hot springs is higher than the temperature of the monkeys. Heat flows from the warmer water to the monkeys. The monkeys feel warmer.



Temperature is the measure of how hot or cold something is. Temperature can be measured in degrees. Water with a temperature of 32 °C (90 °F) is hotter than water with a temperature of 12 °C (54 °F).

Remember, heat is energy. Heat always moves from an object with a higher temperature to one with a lower temperature.

The red part of the metal horseshoe has a very high temperature. Heat moved from the fire into the red part of the horseshoe.



Heat Can Move

In each picture, heat will flow from one object to another. Draw an arrow to show which way it will flow.



Turn Up the Heat

Heat moves from something warmer to something cooler. You rely on that every day. How? Here is just one way.

Active Reading As you read these two pages, underline signal words that identify sequence.

Would you like to eat nothing but raw food? Ugh! For things to cook, they must gain heat energy.

Heat moves from the blue flames to the pot. Then it moves from the pot to the stew. The heat cooks the stew.



1 This oven is used to bake food. Heat moves from the oven to the air inside the oven. Then it moves from the hot air to the food. The heat from the oven baked these cookies!

2 Some things slow the movement of heat. The woman in the picture is using oven mitts. The mitts slow the movement of heat, so she does not get burned.



Do the Math!

Read a Table

1. What foods are cooked at 145 °F?

2. Which food needs to be cooked at a higher temperature, eggs or chicken?

3. What food is cooked at 160 °F?

Safe Food Cooking Temperatures

Type of Food	Cooking Temperature
Eggs	160 °F
Salmon	145 °F
Beef	145 °F
Chicken	165 °F





Hot Light

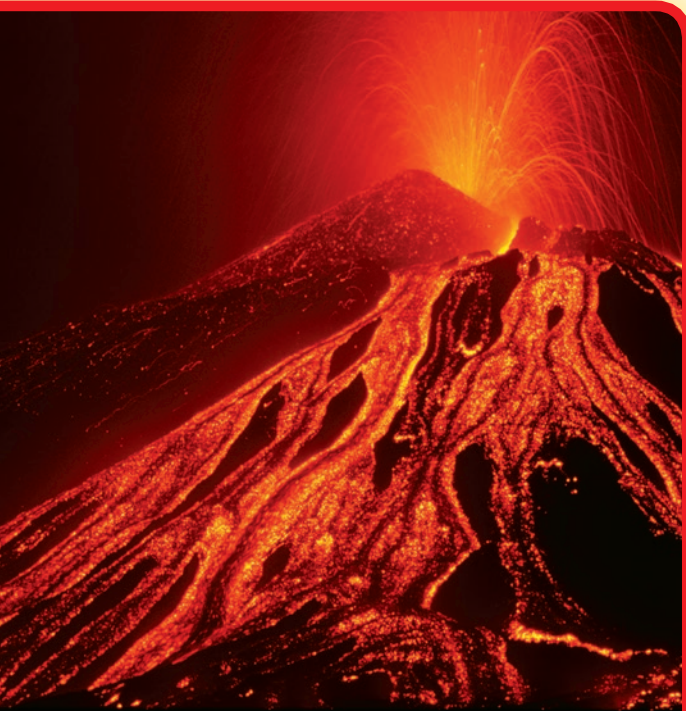
Old-fashioned light bulbs give off heat. Some newer kinds give off more light and less heat.

Have you ever touched a light bulb that had been on for a while? The heat may have surprised you!

Active Reading As you read these two pages, draw a star next to what you consider to be the most important sentence, and be ready to explain why.

You've learned that heat is energy. But remember, light is a form of energy, too. Heat and light often occur together. Many things that give off light also often give off heat.

The light bulb is used for its light, but it also gives off heat. The coil inside a toaster gives off heat. That's how the bread gets toasted. But the coil also gives off an orange-red light. When something gives off both light and heat, we often want to use just one or the other.



It's not unusual to see something glowing red and giving off heat. That's what the lava is doing in this picture.



**The sun gives off light,
and it also gives off heat.
We need both to survive.**

Heat and Light Sources

How many things in your house give off light and heat? List some of them here.



**The charcoal is giving off
orange light. It also gives off
the heat that cooks the meat.**



**The light from a candle's
flame can let us see
in a dark room. The
heat from the flame
melts the wax.**



Burn Rubber



If you're ever out in the cold without gloves, rub your hands together. The heat you produce will warm your hands!

Q: Can you make a fire by rubbing two sticks together?

A: Yes, if one of them is a match!

That's an old joke, so you may have heard it before. However, you actually can make a fire by rubbing two sticks together. You have to move them quickly, and you must have something nearby to burn. But it can be done. Where do you think the heat comes from?

Active Reading As you read these two pages, draw circles around two words or phrases that are key to understanding the main idea.

The tires are rubbing against the road as they spin. They're spinning very quickly and producing a lot of heat. They're getting so hot that they're burning. That's where the smoke is coming from.

When two things rub against each other, there is *friction* [FRĪK•shuhn] where they touch. Friction produces heat. The faster and harder the two things rub, the more heat is produced.

Where Is Heat Produced?

In each photo, two things are rubbing together to produce heat. Draw a circle around the point where the heat is being produced. Then write a caption for each picture.







Sum It Up!

When you're done, use the answer key to check and revise your work.

Write the correct word in the blank.

1

Things that give off

often give off heat as well.



2

is measured in degrees.



Complete the graphic organizer.

Heat

can be produced by (3) _____

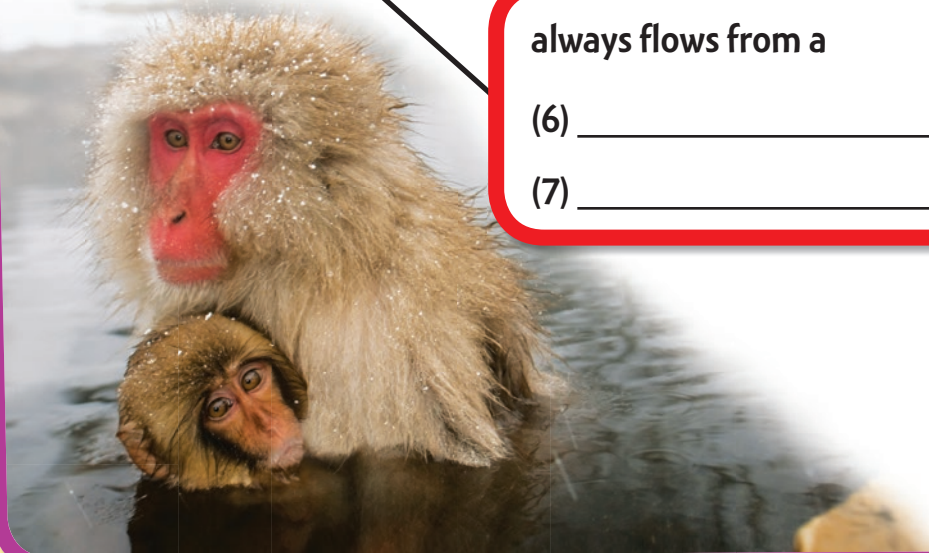
two things (4) _____.

is a form of (5) _____.

always flows from a

(6) _____ object to a

(7) _____ object.



Name _____

Word Play

1

Use the clues to help unscramble each word. Write the unscrambled word in the boxes.

Something with a higher temperature is

ETHOTR

--	--	--	--	--	--

Something that is hot may do this.

WLGO

--	--	--	--	--

The measure of how hot or cold something is

MTEERPUTAR

--	--	--	--	--	--	--	--	--	--	--

Friction from spinning race car tires might cause this.

MKSOE

--	--	--	--	--	--

This produces heat when two things rub together.

ITRNFICO

--	--	--	--	--	--	--	--

Something with a very low temperature is this.

OCDL

--	--	--	--	--

Unscramble the letters in the circles to form a word that is related to this lesson.

--	--	--	--	--	--	--	--



Apply Concepts

2 Circle the object that can give off heat but not light.



sun



candle



hot chocolate

3 Name two things you sometimes do to prevent heat from being transferred.

4 Name two things that give off both light and heat.

5 Name one way that you use heat.



With your family, pick two rooms in your home. Go through the rooms, looking for everything that produces light. For each thing you find, discuss if that thing also produces heat.