

Level
C

Exploring **Content** **Area** **READING**

- Science • Social Studies
- Language Arts • Mathematics

Teacher Created Materials, Inc.

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Turning Up the Heat:

An Experiment About Global Warming

The Earth's atmosphere lets in light and heat from the sun. Normally, much of this heat eventually escapes into outer space. But certain gases (called greenhouse gases) in the atmosphere trap some of the outgoing heat. As greenhouse gas levels increase, more heat is trapped in the atmosphere. When this happens, the Earth's temperature rises. This is called the greenhouse effect. To create a miniature greenhouse effect, try this experiment.

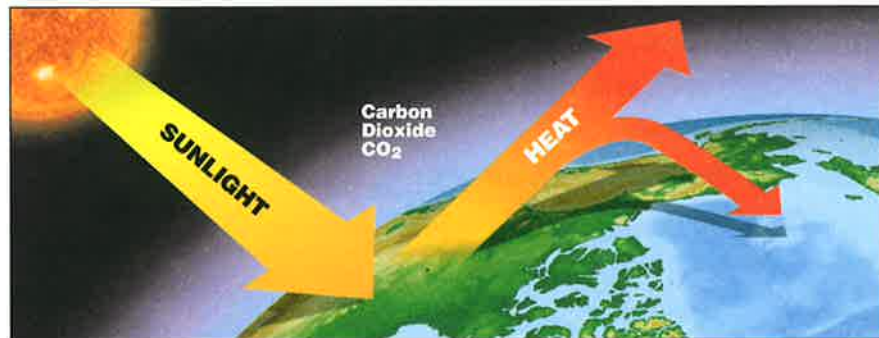
	TEMPERATURE AFTER...										
	10 min.	11 min.	12 min.	13 min.	14 min.	15 min.	16 min.	17 min.	18 min.	19 min.	20 min.
Thermometer 1											
Thermometer 2											

You Need

- Two small thermometers
- A small plastic container
- A desk lamp or a sunny area

You Do

1. Place two thermometers a few inches apart under the lamp or in direct sunlight.
2. Wait 10 minutes. Then on the chart above, write the temperature readings of both thermometers.
3. Cover one thermometer with the clear plastic container. This is thermometer 2. Make sure the container doesn't block the light falling on the uncovered thermometer.
4. Every minute, for 10 minutes, record the readings of both thermometers.



What Happens

How does this experiment show the way global warming works? The temperature in the covered thermometer rises faster than in the uncovered one. The container acts like a tiny greenhouse. It lets in light

and heat. But the plastic doesn't let out much of the heat. The plastic container traps heat like greenhouse gases trap heat in Earth's atmosphere. The result is a quick build-up of heat.

Comprehension Connection



Before Reading

1. What is an experiment? What do you do in an experiment?
2. How do you get ready to do an experiment?
3. Look at the card. What is the person doing this experiment supposed to write? How do you know that?

During Reading

1. How does this experiment demonstrate global warming? What section on the card helps you understand this?
2. How important is it to take careful thermometer readings? Explain your answer.
3. At the end of the experiment, what patterns would you expect to see in the numbers in the chart?

After Reading

1. How is the air in the plastic container like the Earth's atmosphere? How is it different?
2. What might happen if you used a black plastic container instead of a clear one?
3. When a car sits in a parking lot on a hot summer day, its inside heats up a lot. How does this demonstrate the greenhouse effect?

Skill Focus

Ask Questions to Understand Concepts

Science concepts can be challenging. Sometimes you have to study hard for the ideas to make sense. One study tool that can help you is asking good questions.

The activity on this card is an experiment. So you know it will test a science concept. The first question to ask is "What is the concept?" The title gives you a clue. It says the experiment is "about global warming." The introduction explains global warming and introduces the related terms *greenhouse gas* and *greenhouse effect*.

Next, ask, "How do the actions in the experiment show something about global warming and the greenhouse effect?" The last sentence in the introduction says to try the experiment "to create a miniature greenhouse effect." The word *miniature* is a good clue. It suggests you will make a tiny model of the Earth's atmosphere in the experiment.

After the experiment, ask, "What does the experiment teach? How does it show something about the greenhouse effect and global warming?" You can answer that question by reading "What Happens."

Writer's World

1. Is an experiment like the one on the card a good way to learn science concepts? Write what you think. Explain why you think that way.
2. Is global warming good or bad for the Earth and the living things on it? Write what you think. Make some predictions about what might happen if global warming continues.
3. Find a science experiment in your science textbook. Compare its organization to that of the experiment on the card. Write how the two experiments are alike and how they are different. Summarize by stating what all experiments have in common.

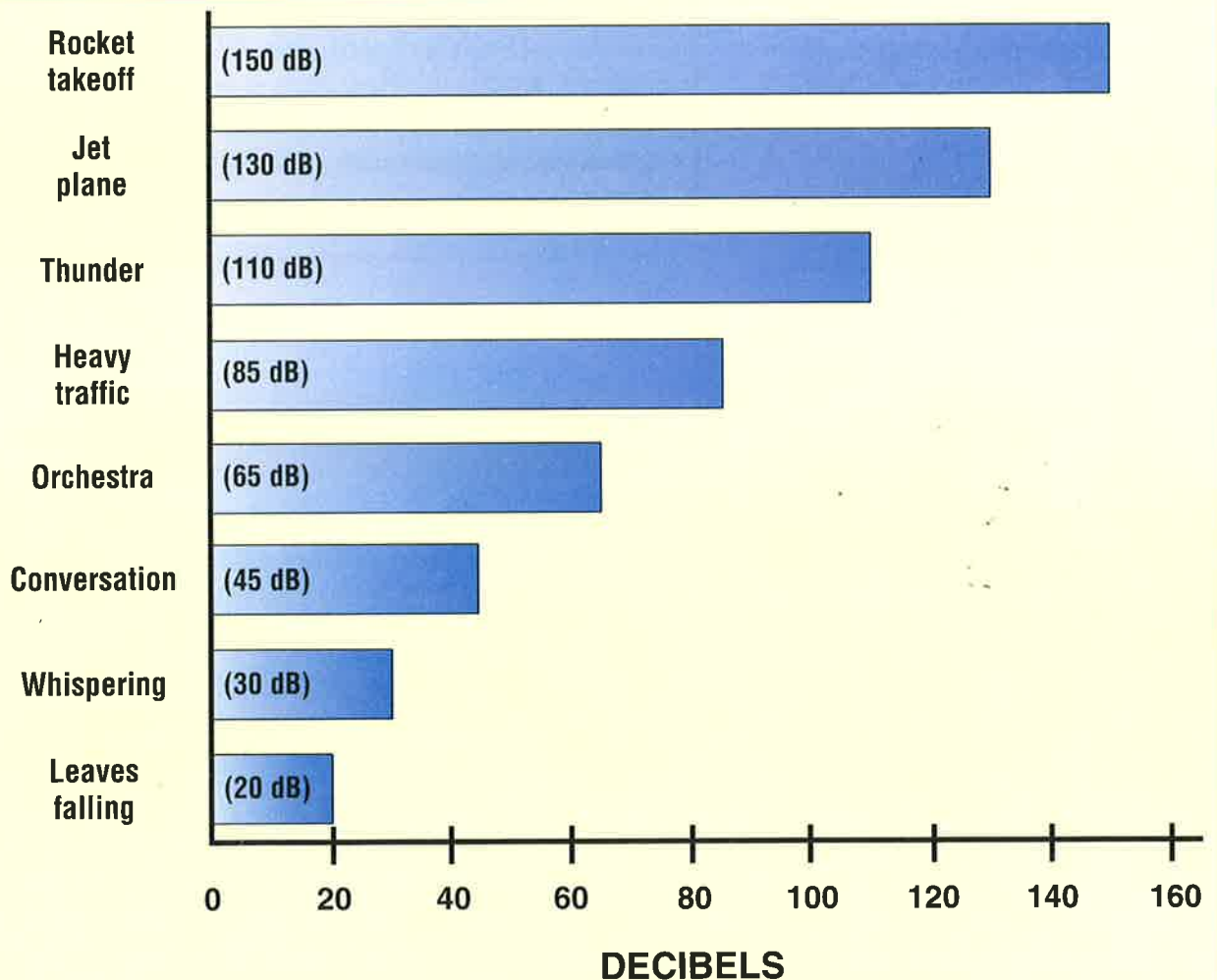


Comparing Sound Levels

A decibel (dB) is a unit of measurement. It measures the loudness and softness of a sound. The faintest sound that can be heard is about equal to one decibel. Every time a sound increases by 3 decibels, the loudness of the sound doubles. This graph compares the decibels of different types of sounds.



SOUNDS



Comprehension Connection



Before Reading

1. What are the loudest and quietest sounds you know?
2. How do you measure length? temperature? Do you think there is a way to measure sound? Why do you think that?
3. Look at the card. What picture do you see? What is this kind of picture called?

During Reading

1. What new measurement word do you learn in the article? Why is the word important?
2. If the sound of a bird fluttering its wings is 5 dB, do you think you could hear it? Tell why or why not.
3. Find "Orchestra" and "Jet plane" on the graph. Is a jet twice as loud as an orchestra? Explain.

After Reading

1. What is the loudest sound on the graph? If you knew you were going to hear this sound, what might you do? Why?
2. About where in the graph would you put a bar for the noise of a vacuum cleaner?
3. In what order did the author present the bars in the graph? Would you use a different order?

Skill Focus

Main Idea and Details

How many times have you said, "Gee! That's loud!" or "I can hardly hear what you're saying!"? Sounds can be loud, soft, or in between. Perhaps you've wondered how sounds are measured. Read the title of the card and you know you're about to find out.

The title and the paragraph make it clear that the main idea of the article is "Levels of sound are measured in units called decibels." Now that you are focused on the main idea, or what the article is about, you can look for details and relate them to the main idea. What are some details in the paragraph?

What else is on the card? You see a bar graph. Since the article is about levels of sound, the bars probably stand for various noises, some loud and some soft. How many bars does the graph have? Each bar probably stands for a sound. Suppose you want to find the loudest sound. Look for the longest bar. That is the sound with the largest decibel measure.

Every detail in the graph and in the paragraph supports the main idea. Thinking about the main idea and details as you read helps you understand what you read.

Writer's World

1. Look in your science textbook or an encyclopedia. Find the decibel measurements for five sounds that are not shown on the bar graph on the card. Make your own bar graph for the five new sounds.
2. Find a bar graph in a textbook or magazine. Write a paragraph that explains what the bar graph is showing.
3. Some doctors say that many people harm their hearing by listening to loud noises such as very loud music. Do you agree? Write what you think and tell why.



The Crisis of Endangered Animals

Chapter Three:

The Orangutan Man of Indonesia

For teachers' inspection ONLY



Willie Smits with furry fellow residents of the Kalimantan rain forest.

Willie Smits went into the Kalimantan rain forest, part of the Asian nation of Indonesia, about 20 years ago. Since then, he has rarely gone back to civilization. The Dutch expert on rain forests is as much at home in the jungles as are the thousands of species of animals and plants around him. But he and fellow foresters have a tough job: saving this precious region from destruction by drought and human-made fires. They work as advisors to the Indonesian government.

Deadly Fires

"For the first 89 days of 1998, there was not a single drop of rain," says Smits. During that dry spell, fires burned out of control. Many of the forest's orangutans died. Smits and his team have rescued at least 230 orangutans since 1997, mostly babies.

"Every day, our people are out rescuing orangutans," he says. Many forestry projects focus on conserving, planting, and studying trees. But Smits and his team know that the orangutans are a key to the survival of the forest. "They distribute the seeds of many important forest trees," says Smits. "If the orangutans are lost, you are bound to lose a lot of biodiversity." Biodiversity refers to a large variety of plants and animals.

Smits' group cares for orphaned orangutans and helps them learn to survive in the wild. That way, these intelligent apes can

be released. "We have taken over the role of the mother orangutan. She usually teaches the baby what it can eat," says Smits. His team also finds good spots in the forest to release apes that have been burned out of their homes.

Born to Be in the Wild

Smits grew up in the Netherlands, a country in Western Europe. He spent most of his free time observing birds. Smits considered becoming a veterinarian, but changed his mind. Later, he discovered tropical forestry, his true calling.

Smits wants to help the forest's cute, red-haired orangutan. But he is even more determined to help the people in its villages. He is helping them plant trees that they can use for food and sell as lumber. That way, they will be less likely to try to make a living by capturing orangutans and selling them illegally. "Helping the people will help the forest," he says.

Now and then, Smits gets discouraged when he sees how badly the Indonesians have treated the Kalimantan forest. "Sometimes it makes you feel desperate," he says. "But we still try to help nature, and people, as much as we can."

