WORLD BOOK

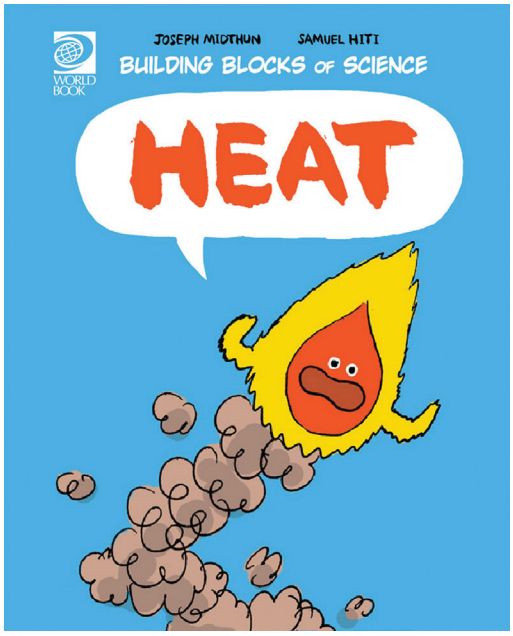
EXCITE EXPERIENCE EVOLVE ENLIGHTEN ENTERTAIN ENRICH ENGAGE EXPLORE ENERGIZE EDUCATE

BUILDING BLOCKS OF SCIENCE

PHYSICAL SCIENCE

LESSON PLAN & GUIDED DISCUSSION

Each of the 10 *Building Blocks of Science* volumes features a whimsical character which guides the reader through a physical science topic. This series is perfect for students across a spectrum of reading comprehension and science mastery levels.



General Information	
Title:	The Heat is On
Materials:	• 3 small plastic containers with lids • Ice cubes • 3 rubber bands • Newspaper • Aluminum foil • A washcloth or old rag • Measuring cups (like ones you'd use for baking)
Objective:	Students will conduct an experiment to determine what materials make the best insulators. While they are waiting for their results, they will participate in a group discussion on the topic of heat.

Lesson	
Group discussion questions:	Make sure your students have grasped the major concepts of this lesson through an informal group discussion. This is an opportunity for you to highlight the most important points in the book and to clarify any uncertainties your students may have. Use the questions below as a guideline but feel free to generate your own! • Tell me about some ways that heat helps people. o How does your family use heat? o How is it used in industry? • What are some natural sources of heat? • What happens to matter when it is heated? What does that do? • What is a thermometer for? How does it work?
Procedure	Fill all four plastic containers with ice cubes and cover each one with a lid. Wrap one of the containers with newspaper. Put the rubber band around the newspaper to hold it to the container. Wrap a second container with the aluminum foil and secure with the rubber band. Wrap the last container with the washcloth and secure with the last rubber band. Set the containers outside in the sun or on a sunny windowsill and wait for 20 minutes. Meanwhile, do the group discussion portion of the activity shown above. Then open each container and measure the amount of water in the containers. Reseal all four containers. Wait another 20 minutes. Meanwhile, work on adding new vocabulary to the Word Wall (see below for references). There is time for all of your students to create at least one word card today. Then check and measure the water in the containers again. Which container of ice melted quickest? Which one melted slowest? Which material was the best insulator?

Vocabulary for the Word Wall:	As a class, decide on a few vocabulary words that were particularly relevant to this activity. For example, • **temperature** • **conductor** • **insulator** • **thermometer** • **thermal energy** • **convection** Pass out a few index cards and ask students to write the vocabulary word on the front of the card and its definition on the back. Students can refer to the glossary on p. 30 as a reference. There are probably not enough words for everyone in the class to make a card so just be mindful that each kid gets a turn at some point during this unit. Post the cards on a "WORD WALL" bulletin board in your classroom.

Common Core Standards highlighted in this lesson	
Standards:	**ELACC4RI1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. **ELACC4RI2** Determine the main idea of a text and explain how it is supported by key details; summarize the text. **ELACC4SL1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.