

Far-Out Guide to the Solar System

Introduction

This teacher's guide helps students learn about the Sun, planets, moons, dwarf planets, asteroids, and comets that make up our fabulous Solar System. Books in the series take readers on a voyage to discover the diversity of objects moving about in space: how they got there, what they are made of, how they relate to the overall system circulating around the Sun, and what the future holds for them.

National Standards

This series supports [Science and Language Arts](#). Go to www.enslowclassroom.com and/or www.enslow.com and click on the Curriculum Correlations tab. Click on your state, grade level, and curriculum standard to display how any book in this series backs up your state's specific curriculum standard.

Classroom Activities

Activities linking to the five curriculum areas: Reading/Language Arts; Math, Science; Social Studies; and the Arts, can be found in this teacher's guide. Hands-on activities and a reproducible handout encourage readers to use comprehension and vocabulary skills relating to the book's subject. Some activities can be reworked to use with any book in the series.

Guided Reading Level: N

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Where to Find More Information About Titles in this Series:

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Titles in this series:	Library Edition ISBN:	Paperback Edition ISBN:
Far-Out Guide to the Sun	978-0-7660-3179-1	978-1-59845-180-1
Far-Out Guide to Mercury	978-0-7660-3180-7	978-1-59845-181-8
Far-Out Guide to Venus	978-0-7660-3181-4	978-1-59845-182-5
Far-Out Guide to Earth	978-0-7660-3182-1	978-1-59845-183-2
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Far-Out Guide to Asteroids and Comets	978-0-7660-3188-3	978-1-59845-191-7

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Teacher's Guide for **Far-Out Guide to Mercury**

Mercury is the closest planet to the Sun. Being so close, Mercury is a pretty hot spot, covered with cliffs, craters, and lava flows. In this book, readers discover fascinating facts about the second smallest planet in our solar system, such as what it's made of, what it's like on the surface; and what space probes have uncovered and have yet to learn about this first planet from the Sun. Readers get the low-down straight from real scientists who work directly on programs designed to help us find out more about Mercury.

Introduction, pages 4–7 Read the title, *Far-Out Guide to Mercury*, aloud and have students discuss the cover photograph. Then browse a few pages, pointing out text features such as the Contents, Index, headings, photo captions, text boxes, and labeled diagrams. Have students use their brief browse to predict what they will learn in the book and to set a purpose for reading. Read pages 5–7 together. Explain that a sequence text structure tells events in the order in which they happen. Discuss sequence signal words, such as *first*, *then*, *next*, *after*, *before*, and *finally*. Add that sometimes there are no signal words, but readers can infer the sequence from the text. Model making a sequence chart to record events in order. Read the second sentence on page 5. Ask students what happened first. Write on the board *The Sun came up over the horizon*. Ask what happened next, then draw an arrow down to a line where you write *The Sun got bigger as it rose*. Have students read the rest of the paragraph and record the events on their own sequence charts. Suggest that students look for other examples of sequence as they read the book. Invite students to share what they found most interesting in this section.

Chapter 1, pages 8–25 Tell students that writers sometimes organize text by stating a problem and then describing a solution. By recognizing this kind of text structure, readers can predict what they will read next, which helps them make meaning of it. Encourage students to look for and record problems and solutions on a two-column *Problem/Solution Chart* as they read the chapter. Point out that the information in each fact box gives more in-depth information related to the main text. Skim and scan the *At a Glance*, *Fast Facts*, and *Timeline* pages together and stress that they summarize information for readers.

Chapter 2, pages 26–37 As students read, remind them to continue to track and record the sequence of events and any problems and solution. Discuss the photos and illustrations and their captions. Ask students how these text features, and the fact boxes, help readers.

Chapter 3, pages 38–43 Let students partner-read and discuss what is ahead for Mercury. Remind them to continue to track and record sequences and problems/solutions. Have partners share and compare their sequence and problem/solution charts and make any additions or corrections. Draw attention to the *Words to Know*, *Find Out More*, and *Index* pages that follow the chapter. Discuss how such information can help readers find information more easily.

After Reading Prompt students to make personal responses to the book by asking: *What one thing about Mercury did you find most interesting? Would you like to be a scientist like Sean Solomon, working on a mission to Mercury? Why or why not? What mystery do you hope Messenger will solve?*

Activities linking to Reading/Language Arts, Math, Science, Social Studies, and the Arts on the page that follows. Make copies of the Handout on the last page. Read the directions aloud, then let students do the page independently.

Activities The Five Curriculum Activities

SAFETY WARNING:

Before doing any activity, make sure students do not have allergies to items needed. Have an adult present at all times to supervise activities requiring the use of sharp or hot/cold objects. Always review directions and safety rules with students before they begin a project.

Reading/Language Arts activity:

Have students imagine they have stowed away on MESSENGER and write several journal entries about what they see as they approach Mercury. Suggest that students use the text for reference but add their own personal views. Share an example: *They say this is the smallest planet but it looks big enough to me! It is dark and we are zooming by at about 124 mph. Still, I can see that the surface is scrunched up like a wrinkly raisin. I see a lot of craters, too!* Encourage students to illustrate their journals and share them with the class.

Math activity:

Point out that on page 20 students learned that on Mercury a 75-pound kid would weigh $28 \frac{1}{2}$ pounds. Challenge students to figure out much a 150-pound person would weigh. (Since 150 is twice 75, $28 \frac{1}{2} + 28 \frac{1}{2} = 47$)

Science activity:

Remind students that Mercury's surface has many craters. Then let students use marbles of different sizes to find out if all colliding objects create the same kind of crater. Cover the floor with newspaper and place a baking pan on it. Spread a 1-inch layer of flour in the pan and sprinkle on paprika or cinnamon to represent dirt and rock. Drop a large marble from 4" above the pan. Carefully remove the marble, then measure and record the diameter and depth of the crater. Invite volunteers to drop different marbles from the same and different heights. Ask several students to pitch marbles carefully sideways, at an angle, into the pan. Measure and record all the data. Discuss the results, then ask: *Why isn't each crater the same diameter as the marble that made it? (impact pushes aside surface) How do you think the craters would look if you dropped oddly shaped pebbles?*

Social Studies activity

Discuss how scientists mapped Mercury, Remind students that a map includes a compass rose, a design that shows north, south, east, west, northeast, northwest, southeast, and southwest. Using the mapping of Mercury on page 37, point to one site, then another and ask students which direction they would go to get to the second point. Invite volunteers to choose two more points and tell which direction to go to get from one to the other,

Arts activity:

Invite students to begin a large mural about the solar system, using photographs from the book for size reference, Have a variety of media available, including paint, markers, colored chalk, scraps of colored paper, scissors, and glue. Let students work together to plan the mural, sketching out an idea and deciding who will do what. Suggest that they start by creating the Sun and Mercury, then continue work on the project as they read the other books in the series and learn about each planet, moons, dwarf planets, asteroids, and comets.

Handout

Find-a-Word

Find these 18 words from the book hiding across, down, or diagonally in the puzzle below: CORE, CRATERS, EXOSPHERE, EXTREMES, FOSSAE, GALILEO, GRAVITY, MANTLE, MAP, MERCURY, MESSENGER, ORBITER, PLANET, RADAR, ROCKY, RUPES, TERRESTRIAL, VOLCANO. How does each word relate to Mercury?

T	Q	V	P	L	A	N	E	T	G	Z	O
E	X	O	S	P	H	E	R	E	R	X	M
R	J	L	R	A	D	A	R	M	A	P	E
R	M	Z	X	B	J	K	C	E	V	E	S
E	Q	A	C	Q	I	Q	O	R	I	X	S
S	Z	N	N	R	Z	T	R	C	T	T	E
T	X	O	Z	T	A	J	E	U	Y	R	N
R	U	P	E	S	L	T	J	R	Z	E	G
I	F	O	S	S	A	E	E	Y	X	M	E
A	J	Z	R	O	C	K	Y	R	Z	E	R
L	G	A	L	I	L	E	O	Z	S	S	V

Answer:

T	Q	V	P	L	A	N	E	T	G	Z	O
X	O	S	P	H	E	R	E	R	X	M	
J	L	R	A	D	A	R	M	A	P	E	
M	S	X	B	J	K	C	E	V	E	S	
Q	A	S	Q	I	Q	O	R	I	X	S	
Z	N	N	R	Z	T	R	C	T	T	E	
X	O	Z	T	A	J	E	U	Y	R	N	
P	U	P	E	S	L	T	J	R	Z	E	G
F	O	S	S	A	E	E	Y	X	M	E	
J	Z	R	O	G	K	Y	R	Z	E	R	
L	G	A	L	I	L	E	O	Z	S	S	V

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