

## 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](http://www.enslowclassroom.com) and/or [www.enslow.com](http://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: **M**

### Reproducible for Educational Use Only

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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: |
|-----------------------------------------------|-----------------------|-------------------------|
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| <b>Far-Out Guide to Mars</b>                  | 978-0-7660-3183-8     | 978-1-59845-185-6       |
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| <b>Far-Out Guide to Asteroids and Comets</b>  | 978-0-7660-3188-3     | 978-1-59845-191-7       |

### Titles in this series can be purchased through all major vendors or directly from:

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## Teacher's Guide for **Far-Out Guide to Mars**

Mars, the fourth planet from the Sun, is a small, cold, and lifeless rocky planet. At its two poles are permanent ice caps made up mostly of solid carbon dioxide, what we call “dry ice” here on Earth. Mars is also home to the largest volcano in our solar system. In this book, readers discover more fascinating facts about this Red Planet that has captured the attention of scientists and science fiction enthusiasts for so long. Readers learn how the planet got its name, what it is made of, and what space probes have uncovered about it. Readers get the facts straight from real scientists who study Mars and run programs designed to find out even more about our neighbor in space.

**Introduction, pages 5–7** Read the title, *Far-Out Guide to Mars*, aloud and have students discuss the cover photograph. Then browse a few pages, pointing out text features such as the Table of Contents, Index, headings, photo captions, text boxes, maps, and labeled diagrams. Read aloud the first two sentences on page 5. Explain that authors often use a descriptive text structure to help readers visualize, or create pictures in their minds. The author selects details that appeal to readers’ five senses (sight, hearing, smell, taste, touch). Invite students to share what they visualize when they read that it snows on Mars. Direct students to use their visualization skills as they read the rest of the section.

**Chapter 1, pages 8–30** Encourage students to continue to use their visualization skills as they read the chapter. Point out the words *right away* in the second sentence on page 14. Explain that words like *right away*, *next*, *then*, and *later* signal a sequence text structure that tells events in the order they happened. Add that sometimes there are no signal words, but readers can infer the sequence from the text. Encourage students to make sequence charts on which to list events in order as they read the chapter. Explain that the charts help readers better remember what they read and understand the relationships between events. Let partners share and compare their results. Skim and scan the *At a Glance*, *Fast Facts*, and *Timeline* pages together and stress that they summarize information for readers.

**Chapter 2, pages 31–37** Remind students to look for places where visualization helps them better understand what they read in this chapter. Have students make sequence charts to record events after *Phoenix* landed on Mars. Let partners share and compare their charts. Discuss what *Phoenix* found that would make it possible to grow something on the planet. Ask students if they think scientists might find “life” of some kind on Mars some day.

**Chapter 3, pages 38–43** Let students partner-read and discuss what is ahead for Mars. Have students speculate on what kinds of fossils *Curiosity* might dig up. 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** Ask students to share what they learned about the make-up and explorations of Mars. To draw out personal responses to the book, ask: *What one thing about Mars did you find most interesting? Would you recommend the book to a friend? Why or why not? Do you think people will travel to Mars in your lifetime? Would you go? Why or why not?* 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 alone or with a partner. Answers: 1. hemalite, 2. planums, 3. whirlwind, 4. snow, 5. microbes, 6. laser, 7. water, 8. phoenix, 9. demos, 10. curiosity, 11. seasons, 12. drill, 13. phobos, 14. silica, 15. canyons, 16. mountain, 17. rover, 18. craters.

## **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 partners use the information they have read about Mars to write a TV commercial promoting the planet as the perfect flyby vacation. Explain that the ad should make people want to enjoy a cruise-ship-like space flight, just skimming over the surface without landing, Encourage partners to use visuals, like a poster and a map, then perform the commercial

### **Math activity:**

Remind students that on page 24 they learned that the diameter of Mars is 6,794 kilometers. Ask: *What is the diameter of Mars rounded to the nearest hundred kilometers? (6,800) to the nearest thousand kilometers? (7,000)*

### **Science activity:**

Discuss how robotic arms on the rovers are controlled by people on Earth. Challenge students to work with a partner to create a robotic hand that can pick up a piece of paper. Have a supply of various materials such as bendable and unbendable plastic straws, salad tongs, wire hangers, scissors, paper clips, rubber bands, tape, pipe cleaners, clay, glue, craft sticks, string, pencils, paper, paper fasteners, Start by having students move their hands and watch how the bones and muscles work, Next, have students slowly pick up a piece of paper using just two fingers of one hand. Then, let students build a device that allows them to pick up the paper without touching it with their hands. Have one partner move the device while the other partner gives the instructions. Invite partners to share their finished devices with classmates.

### **Social Studies activity**

Have students use the map on pages 8-9 to practice their map skills. Ask volunteers to point to one location, then another and tell the direction a rover would go to get there. After the volunteers give an answer, have them name something in the room or in the school that is in the same direction from where they sit.

### **Arts activity:**

Discuss whirlwinds and how they move across Mars. Explain that we have whirlwinds on Earth as well. Then challenge students to make up a "Dance of the Whirlwinds." Borrow some classical recordings and play them for students and allow them to pick the music they wish to use. Then give students room and let the dance! If possible, videotape the performances.

## Handout

### Cross-a-Word

One column in the puzzle below spells MARS IS THE RED PLANET. Read each clue, then fill in the missing letters of words that go across.

#### Clues

- |                                                                 |                                           |
|-----------------------------------------------------------------|-------------------------------------------|
| 1. Iron-rich mineral that forms in water                        | 10. Car-sized rover going to Mars in 2012 |
| 2. Mars' plains                                                 | 11. Winter, spring, summer, and fall      |
| 3. A spinning column of air                                     | 12. Used to dig into the ground           |
| 4. Wintery stuff found on Mars                                  | 13. One of Mars' moons                    |
| 5. Tiny living things that might make the methane found on Mars | 14. Mineral in sand and quartz            |
| 6. Device with a narrow light beam                              | 15. Valles Marineris is a system of these |
| 7. Liquid needed by all living things                           | 16. Husband Hill is one                   |
| 8. Mars lander that found snow                                  | 17. <i>Spirit</i> was one of these        |
| 9. One of Mars' moons                                           | 18. Bowl-shaped holes on Mars             |

[DESIGN: Puzzle has a **filled-in column** that spells MARS IS THE RED PLANET from top to bottom, and empty boxes where kids write in other letters. I **ghosted-in answers** to show where boxes go **BUT** real puzzle shows **ONLY NUMBERS** and **MARS IS THE RED PLANET.**]

|                 |                 |                 |                        |   |   |   |   |   |   |
|-----------------|-----------------|-----------------|------------------------|---|---|---|---|---|---|
|                 | <sup>1</sup> H  | E               | <b>M</b>               | A | L | I | T | E |   |
|                 | <sup>2</sup> P  | L               | <b>A</b>               | N | U | M | S |   |   |
| <sup>3</sup> W  | H               | I               | <b>R</b>               | L | W | I | N | D |   |
|                 |                 |                 | <sup>4</sup> <b>S</b>  | N | O | W |   |   |   |
|                 |                 | <sup>5</sup> M  | <b>I</b>               | C | R | O | B | E | S |
|                 | <sup>6</sup> L  | A               | <b>S</b>               | E | R |   |   |   |   |
|                 | <sup>7</sup> W  | A               | <b>T</b>               | E | R |   |   |   |   |
|                 |                 | <sup>8</sup> P  | <b>H</b>               | O | E | N | I | X |   |
|                 |                 | <sup>9</sup> D  | <b>E</b>               | M | O | S |   |   |   |
|                 | <sup>10</sup> C | U               | <b>R</b>               | I | O | S | I | T | Y |
|                 |                 | <sup>11</sup> S | <b>E</b>               | A | S | O | N | S |   |
|                 |                 |                 | <sup>12</sup> <b>D</b> | R | I | L | L |   |   |
|                 |                 |                 | <sup>13</sup> <b>P</b> | H | O | B | O | S |   |
|                 | <sup>14</sup> S | I               | <b>L</b>               | I | C | A |   |   |   |
|                 |                 | <sup>15</sup> C | <b>A</b>               | N | Y | O | N | S |   |
| <sup>16</sup> M | O               | U               | <b>N</b>               | T | A | I | N |   |   |
| <sup>17</sup> R | O               | V               | <b>E</b>               | R |   |   |   |   |   |
| <sup>18</sup> C | R               | A               | <b>T</b>               | E | R | S |   |   |   |