Teaching Guide to *Shortcuts* by Jeff Harris

Introduction

Shortcuts by Jeff Harris is a beautifully illustrated, fact-packed page that makes learning fun. Each week, *Shortcuts'* multicultural cast (Juanita, K., Roland, Junior and James) offers facts, riddles, jokes and puzzles to help kids learn about science, geography, animals, food, history and holidays.

Each teaching guide provides ideas for expanding the lesson and creating discussion and learning activities for your students. The grade level for the guides is usually 3rd to 4th, but they can be adapted for use at other levels. The guides are broken down into four areas:

1. Questions for Discussion and Further Study

Designed to help students think and research, not just give one-word answers

2. Activity Ideas

Designed to allow students to be creative and teach themselves

3. Use the News

Designed to have students use the news in studying each topic

4. Quick Quiz

Designed to be adaptable to several grade levels, evaluate students' comprehension and build vocabulary and math skills

You might use the teaching guides in the following ways:

Questions for Discussion and Further Study: Engage the entire class by asking each question aloud and listing the students' answers on the board. Or have them use reference resources to give their own answers to the questions. Allow them to discuss other students' answers after they've researched the topics. Key words or phrases that can help students search for more information are italicized.

Activity Ideas: Give the students a time limit to research their projects, using library or study time. By having the students cite their resources, you can check their work; or, alternatively, tell them which resource(s) you prefer them to use.

Use the News: These can be worked on individually but we suggest they work in groups to learn teamwork skills.

- **Quick Quiz:** We suggest you review the quizzes ahead of time and change the phrasing or difficulty level based on the students' abilities.

Shortcuts: HOT ON THE TRAIL OF SUNSPOTS

For release the week of: February 24, 2014

Objective: After completing the exercises, students should have a better understanding of sunspots.

Subject Areas: The following information about sunspots will be discussed:

- Viewing sunspots safely
- Sunspots and coronal mass ejections
- Diameter of sunspots and the Earth

Evaluation: Students may be evaluated using the following point scale:

Four points: Information is accurate, organized, shows creative thought/use of materials
Three points: Information is accurate and organized
Two points: Information is mostly accurate; organization needs some work
One point: Significant inaccuracies; lacks organization

Topics for Discussion and Further Study

1. Is it possible to view a sunspot safely without a solar telescope?
2. Does the appearance of sunspots correspond with any changes here on Earth?

Activity Ideas

- Sunspots themselves are not harmful to Earth, but another solar event can cause problems for us. Sunspots, solar flares and coronal mass ejections seem to occur in the same 11-year cycles. Coronal mass ejections involve a huge amount of energy suddenly released from the sun. If it heads directly toward Earth, it could be devastating. Explore this website and other sources of information to learn more about this solar phenomenon. http://science.howstuffworks.com/solar-flare-electronics.htm
- If some large sunspots can be 80,000 km (50,000 miles) in diameter, and thus equal to approximately 6 Earths laid side by side, can you determine how wide Earth is? How could you figure this out? After you make your calculations, check them with the real diameter of the Earth. Is it close?

Use the News

- What is the exact time of sunrise and sunset in your area? One way to find this information is to look in your newspaper. Read your paper to learn about these times. Will these times be different tomorrow? Check them every day for at least a week to see how much they change daily or even weekly.

Answers to the Quiz

1.) b, 2.) c, 3.) b, 4.) b, 5.) b, 6.) c , 7.) umbra, 8.) magnetic, 9.) 110,000 km, 10.) 10,000 km

Quick Quiz — Sunspots

1. The size of sunspots always remains the same.
a. True b. False

2. A small sunspot is called a _____.
a. spore b. microspot c. pore d. spec

3. Sunspots are much hotter than the rest of the sun.
a. True b. False

4. Sunspots change on an _____ -year cycle.
a. 2 b. 11 c. 33 d. 100

5. Sunspots rarely form in pairs.
a. True b. False

6. Sunspots last only a few _____.
a. minutes b. hours c. days d. months

Vocabulary Comprehension

7. The central area of a sunspot is called the "_____."

8. Scientists believe sunspots are formed when _____ fields break through the surface of the sun.

Math Comprehension (subtraction, division, addition, fractions)

9. If one sunspot were 11,000 km in diameter, how wide would 10 of these be side-by-side?

10. One third of a 30,000-km sunspot would be how much?