

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: A CLEARER PICTURE OF NEBULAE

For release the week of: August 6, 2012

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

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

- Size and composition of nebulae
- Locating and observing nebulae
- Nebulae as art

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. How big are nebulae in comparison to our solar system and our galaxy, the Milky Way?
2. What kinds of gases and dust are in a nebula?

Activity Ideas

- Pictures are great, but real astronomical viewing is exciting. You can use a telescope, binoculars, or just your naked eye. Try these links for instructions on how to find objects such as the Orion Nebula. <http://www.mattastro.com/m42.html> That link will guide you to the nebula if you can find the constellation of Orion. If you can't find Orion, try this link: <http://www.astroviewer.com/interactive-night-sky-map.php>
- Now let's get creative. Chalk or oil pastels are an ideal medium for making pictures of nebulae. Use black construction paper or black poster board for the background of the night sky. The chalk or pastels can be blended with your finger, tissue, Q-tip, etc. Here are two videos to give you some ideas on how to use pastels. The first one is very basic about blending on black paper, the second video shows how to create waves on the ocean, which could look similar to the gaseous clouds in your nebula picture.
<http://www.youtube.com/watch?feature=endscreen&v=KnwYIUqfXNA&NR=1>
<http://www.youtube.com/watch?feature=endscreen&v=PRQsxfIZTQ&NR=1> Before you get started with your own drawing, you should look at or print out a photo of a real nebula. There are library books and Internet sites with many of these photographs for your inspiration.

Use the News

- NASA recently successfully landed the Mars explorer Curiosity. Here's one of several videos showing both real views of the engineering team and animated views of Curiosity during the landing on August 5, 2012.
http://www.youtube.com/watch?v=Ti_yre6dsa4&list=UULA_DiR1FfKNvjuUpBHmylQ&index=0&feature=plcp If you have time, here is the press conference following the landing. Some

of the scientists involved give very interesting information and personal opinions about the landing and their lives.

http://www.youtube.com/watch?v=FVzfDZIEwaU&feature=autoplay&list=UULA_DiR1FfKNvjuUpBHmylQ&playnext=1

Answers to the Quiz

1.) a, 2.) d, 3.) a, 4.) a, 5.) a, 6.) c , 7.) cloud, 8.) Gravity 9.) 1145 , 10.) 193,229

Quick Quiz — Nebulae

1. French astronomer Nicolas-Claude Fabri de Peiresc, discovered the Orion Nebula in 1610.
a. True b. False
2. Ptolemy, a _____ astronomer and mathematician, made some of the first observations of nebulae more than 1,800 years ago.
a. French b. Chinese c. British d. Greek
3. During the 1600s and 1700s, nebulae were studied by astronomers such as Christian Huygens and Edmond Halley.
a. True b. False
4. Astronomers believe nebulae are areas where new _____ are formed.
a. stars b. galaxies c. planets d. meteorites
5. A supernova explosion created the Crab Nebula.
a. True b. False
6. A(n) _____ nebula is a nebula that glows brightly because of intense radiation from a powerful nearby star.
a. dark b. reflection c. emission d. diffuse

Vocabulary Comprehension

7. The word nebula comes from the Latin word for _____.
8. _____ causes the dust and gas in a nebula to collect together.

Math Comprehension (subtraction, division, addition, fractions)

9. How many stars would be left if 918 stars died in a group of 2063?
10. 129,007 stars plus 64,222 stars equals how many stars?