

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: TUNING IN TO RADIO WAVES

For release the week of: April 1, 2013

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

Subject Areas: The following information about radio waves will be discussed:

- Types of electromagnetic radiation
- Uses for radio waves
- The scientists who first worked with radio waves

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. What's the difference between radio waves, micro waves, and visible light waves?
2. What is "electromagnetic radiation?"

Activity Ideas

- What are radio waves used for? First, brainstorm a class list of as many uses as you can think of. Next, do some research to increase (and correct) your list. Here is one webpage to get you started: <http://en.wikipedia.org/wiki/Radio> .
- Who were the people that first experimented with radio waves? Research and report on scientists such as Michael Faraday and Nikola Tesla.

Use the News

- Scientific discoveries and new technologies are occurring more rapidly every day. What types of science do you see reported on in the newspaper? What is the science? How is it being used? Who discovered or developed it? Share what you find with the rest of the class.

Answers to the Quiz

1.) a, 2.) b, 3.) a, 4.) c, 5.) a, 6.) a , 7.) light, 8.) amplitude, 9.) 96, 10.) 26

Quick Quiz — Radio Waves

1. Radio waves are the longest type of electromagnetic wave.
a. True b. False
2. Radio _____ are used to track and study wild animals.
a. telescopes b. beacons c. ovens d. bacons
3. It takes less than four and a half years for radio signals from Earth to reach other stars in our galaxy.
a. True b. False
4. Nicola _____ worked with radio waves in the United States in the 1830s.
a. Faraday b. Di Vinci c. Tesla d. Hertz
5. Radio waves can cook food.
a. True b. False
6. FM radio means “_____ modulated radio.”
a. frequency b. full-time c. finely d. fabulous

Vocabulary Comprehension

7. Radio waves move at the speed of _____.
8. The strength of a radio wave is called the _____.

Math Comprehension (subtraction, division, addition, fractions)

9. What is the total number of waves if there are 8 groups of 12 waves?
10. If a signal has a frequency of 52 hertz, how many hertz would half that be?