

# 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 3<sup>rd</sup> to 4<sup>th</sup>, 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: CLEARING THE AIR ABOUT AIR**

For release the week of: July 23, 2012

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

**Subject Areas:** The following information about air will be discussed:

- Atmosphere as protection
- Air pressure
- Layers of the atmosphere

**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. Why does helium make our voice sound “squeaky”?
2. How can air protect us from space debris and meteorites?

## **Activity Ideas**

- Since air pressure is all around us, we don't feel it coming from one direction. However, if we can change the pressure, we might be able to feel some of the weight of the atmosphere on our bodies. Here is a simple science experiment/demonstration about air pressure. All you need are some large trash bags and a vacuum cleaner.  
<http://www.mindtrekkers.mtu.edu/docs/TrashBagandVacuum.pdf> Check out the link to the Internet video provided in the lesson plan.
- Scientists divide our atmosphere into four layers. The troposphere is the lowest. What are the other layers? What makes each layer unique? Research and report on the layers of our atmosphere.

### **Use the News**

- Air pollution can be caused by humans or can occur naturally. Which pollution-related events in the newspaper are caused by humans, and which ones are caused by nature? Read the newspaper and discuss what you find. A two-column list could be made with the results of your search.

## **Answers to the Quiz**

1.) a, 2.) b, 3.) b, 4.) d, 5.) b, 6.) c , 7.) aerosols, 8.) troposphere 9.) 21% , 10.) 500 lbs. per square foot

# Quick Quiz — air

1. Our air protects us from the sun.  
a. True b. False
2. Scientists divide the atmosphere into \_\_\_\_\_ layers.  
a. Two b. four c. ten d. eighteen
3. We don't feel air pressure from our atmosphere because it is not very powerful.  
a. True b. False
4. Our air is mostly \_\_\_\_\_.  
a. helium b. oxygen c. hydrogen d. nitrogen
5. Wind flows from low- to high-pressure areas.  
a. True b. False
6. Most air pollution is caused by \_\_\_\_\_.  
a. volcanoes b. fires c. people d. dust

## Vocabulary Comprehension

7. Air contains extremely tiny particles called \_\_\_\_\_.
8. The \_\_\_\_\_ is the lowest layer in our atmosphere.

## Math Comprehension (subtraction, division, addition, fractions)

9. If 78% of our air is nitrogen and 1% is argon (and other gases), what percent is oxygen?
10. What is  $\frac{1}{4}$  of the sea level -- 2,000 lbs. per square foot?