

# 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 Newspaper**

Designed to have students use the newspaper 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 Newspaper:** 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: BONDING WITH MOLECULES**

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

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

- Molecule motion
- Molecule diagrams, symbols and formulas
- Names of the atomic elements

**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 is DNA?
2. Is there a way to “speed up” or “slow down” the motion of molecules?

## **Activity Ideas**

- What does the chemical diagram of a molecule look like? Research and draw a diagram of a water molecule. Look for two or three more and draw those also. Be sure to label each atom and name the molecule.
- Molecules are made up of atoms. How many atomic elements can you name? Break up into groups and see how many elements you already know.

## **Use the Newspaper**

- ❖ CO<sub>2</sub> is the symbol for carbon dioxide, one of the “greenhouse gases.” Read the newspaper for information about global warming, pollution, climate change, etc. What is the article reporting? Why is it currently in the news? Share what you find with the class.

## **Answers to the Quiz**

- 1.) b, 2.) a, 3.) a, 4.) c, 5.) a, 6.) d, 7.) bonds, 8.) compound, 9.) 8, 10.) 1,216

### **Quick Quiz – Molecules**

1. Hydrogen is the biggest type of molecule.  
a. True                      b. False
2. \_\_\_\_\_ bonded molecules have atoms that share electrons.  
a. Covalent                      b. Composite  
c. Ionic                              d. Magnetic
3. A single molecule is constantly rotating.  
a. True                      b. False
4. A molecule that is made of two atoms is called a \_\_\_\_\_ molecule.  
a. covalent                      b. ionic  
c. diatomic                      d. DNA
5. It is impossible to see molecules.  
a. True                      b. False
6. Molecular \_\_\_\_\_ is the most abundant molecule in the universe.  
a. oxygen                      b. DNA  
c. nitrogen                      d. hydrogen

### **Vocabulary Comprehension**

7. The forces that hold molecules tighter are called \_\_\_\_\_.
8. A molecule that is made of different elements is called a \_\_\_\_\_.

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

9. If 128 atoms were grouped into 16 equal molecules, how many atoms would be in each molecule?
10. How many atoms would be there be all together if there were 64 molecules with 19 atoms in each one?