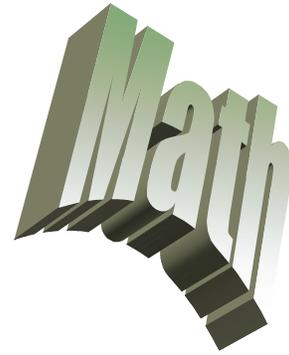


# Algebra/Geometry Institute Summer 2005



## Lesson Plan 3: Finding Rates

**Faculty Name:** Harriet Johnson

**School:** Carver Upper Elementary, Indianola School District

**Grade Level:** 5th

### 1. Teaching objective(s)

The student will solve rate problems using multiplication.

### 2. Instructional Activities

Begin the lesson by giving a prompt on a situation involving rates.

Say, "I went to the grocery store and bought some oranges for \$0.80 per pound.

Ask students what \$0.80 per pound means. Call on volunteers to provide an explanation.

Tell students the phrase "oranges for \$0.80 per pound" means each pound of oranges costs \$0.80.

Point out the word *per*. Tell students *per* means a constant amount "for each."

Have students assist in generating a table of various examples of rate. List examples of rate on one side of the table and list the meaning of each rate on the other side. Use the following table as a guide:

Rates	Meaning of Rate
Speed limit: 45 miles per hour	Vehicles may only drive 45 mph.
Two slices of pizza per student	Each student gets two slices of pizza
Ribbon at \$0.60 per yard	Each yard of ribbon is \$0.60
Limit: 4 free tickets per student	Each student may get 4 free tickets

Discuss the table with the class. Allow time for questions and clarification.

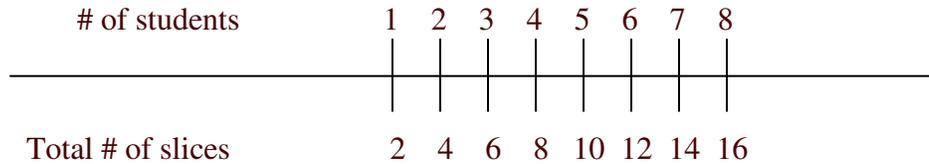
Give students a definition of a rate. (Rate is the amount of one thing for each of some other thing).

Tell students that rate tells about a relationship between a pair of numbers.

The rate can be used to find the amount needed for any given number.

Inform students that a number line may be used to show the relationship between a pair of numbers.

Display a number line on transparency. Use one of the examples of rates listed on the board to show how this is done. (Example: Two slices of pizza per student).



Have students assist in completing the number line. (Ask students how many slices of pizza each number of students will get).

Before completing the number line, ask students if they discovered a pattern. Allow students time to carefully observe the number line. Call on volunteers.

After completing the number line, tell students the number line shows that for each student there are two more slices of pizza.

Ask students various questions using the number line as a guide.

Ask, “How many slices of pizza will be needed for 5 students? Call on volunteers for responses. (Answer: 10 slices of pizza).

Ask students what the number **two** represents in the problem.

Tell students the “two” is the rate or the number of slices of pizza each student may get. It means “two slices of pizza for each student.”

Tell students to figure out how many slices of pizza will be needed for 5 students, we multiply  $5 \times 2$ . (the number of students  $\times$  the number of slices of pizza).

Tell students if the number of students increases, the number of slices of pizza increases. Fewer slices of pizza are needed if there are fewer students.

Explain that no matter how many or few students there are, we can always find the number of slices needed by multiplying the number of students by the rate.

Ask students how many slices of pizza will be needed for 20 students. (This will allow students to think about solving rates using multiplication because the number 20 is not displayed on the number line). Call on volunteers. Allow time for questions and clarification.

Inform students that the rate remains the same no matter how many students there are.

After students have an understanding of rates, divide students into groups of five.

Give each group a sales paper from the grocery store. Have each group find 2 rates from the sales paper.

Instruct students to record the rates, tell what the rates mean, generate a question from each rate, and finally answer each question. (Each group will decide on who will perform each task).

Allow each group to share their findings.

After completing the activity, pass out worksheets on rates. (See attachment).

Allow students ample time to complete the worksheet.

### 3 Materials and Resources

Chalk

Chalkboard

Transparency

Sales paper

Worksheet on rates

Resource: National Center on Education and the Economy. [America's Choice: Multiplication Core Assignments](#). Copyright 2002.

### 4 Assessment

The teacher will walk around the room to monitor each student's progress.

He or she will be looking for correct answers and how each answer is justified.

Worksheets will be taken up and graded.

Name \_\_\_\_\_

**Directions: Read the story and answer each question. Show your work by using a number line and multiplication. Justify each answer provided.**

**Ms. Johnson wants to give three pencils to each of her students. There are 16 students in the class.**

- 1. What is the rate in this story?**
- 2. What happens to the rate if three students are absent on the day she gives away the pencils?**
- 3. How many pencils will Ms. Johnson give away if only half the students are present?**
- 4. How many pencils will be given away if the entire class is present?**
- 5. What happens to the rate if two more students enter the class on the day she gives the pencils away?**