

**GOLD  
SEAL  
LESSON**

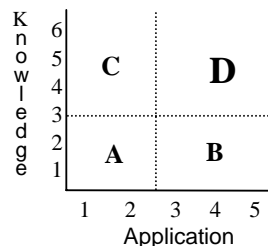


## Persuade Your Audience!

**Subject(s)**

Mathematics

**Rigor/Relevance  
Framework**



**Grade Level 7**

**Instructional  
Focus**

**Number Operation and Concepts:** Students use number, number sense, and number relationships in a problem-solving situation. Students communicate the reasoning used in solving these problems.

**Tools and Technology:** Students use appropriate tools and technologies to model, measure, and apply the results in a problem-solving situation. Students communicate the reasoning used in solving these problems.

**Language Arts Integration:** Students synthesize individual language arts skills.

**Student  
Learning**

- Students will correctly interpret a ratio statement that uses the phrase “out of.”
- Students will use the idea of a “multiplier” or a “scaling factor” to apply proportional reasoning in a problem-solving situation.

**Performance  
Task**

**Overview**

Students will create an advertisement that makes use of the term *out of*. Individually, students can use the PowerPoint, Microsoft Word or Publisher to create the ad. The actual data should accompany the ad as support. The advertisement should simplify the ratios in the data in lowest terms.

**Description**

A *proportion* is defined as two equal ratios. Since the product of the means equals the product of the extremes, “cross-multiplication” is a typical algorithm taught to middle school students as they try to find the missing value in a proportion. It might be argued that this algorithm *only* be introduced after students already grasp the concept of using a “multiplier” to create equal fractions. Note: Refer to the attached worksheets and PowerPoint presentation.

The teacher should begin by ensuring that students understand the definition of *ratio* and should provide practice problems that ask students to convert a ratio that compares two parts to a ratio that compares a part to

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**Performance Task**  
(con't.)

a whole, or vice versa. It is important to isolate this small skill so that students master it before jumping into more complicated ratio problems.

To become mathematically literate, students must know how to interpret common verbal phrases like *out of* correctly. Direct instruction in this skill is necessary for most middle school students. One technique that works well is to ask students to act out the problem. For instance, if a survey states that two out of seven people surveyed prefer vanilla ice cream to chocolate ice cream, the teacher could ask seven students to stand in front of the room with previously prepared signs that illustrate their preference. To extend this concept, seven more students could join the first group and hold appropriate signs. This illustrates that the “multiplier” is 2 and the ratio remains the same. If there are enough students in the classroom, another group of seven could join the first group to illustrate a multiplier of 3, with the ratio remaining the same. The teacher can then lead a discussion about the two parts versus the whole. Active participation in an activity like this will help students to understand and remember the use of the phrase, *out of*.

To extend this into a Gold Seal Lesson, students are asked to create an advertisement that makes use of the term *out of*. It would be interesting to collaborate with the language arts teacher on the team for this project. Students can choose to create a print ad, a radio ad, a video, a PowerPoint presentation, or an Internet pop-up type ad. The advertisement must refer to data that supports the claim in the ad and must use the phrase *out of*. An advertisement does not have to sell a product! It could “sell” membership in an organization, as in “Nine out of ten people are glad that they joined the computer club.” It could “sell” an opinion about a controversial subject, as in “Five out of nine students surveyed think that there should be a homework ban on weekends.” Students should be encouraged to choose a topic that interests them, and they should collect authentic data about the topic by actually polling a group of people. The actual data should be submitted, but the advertisement should simplify the ratios in the data to lowest terms.

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**Essential Skills**

- Perform operations with signed (positive and negative) numbers, including decimals, ratios, percents, and fractions. (m1)
  - Understand the best procedures for statistical data collection, organization, and display including making estimates and predictions and drawing inferences. (m5)
  - Present information in a well-organized fashion that will be clear to the target audience. (e11)
  - Use brainstorming, role playing, and standard problem-solving strategies to define a problem and suggest solutions. (e19)
  - Understand and use graphs, charts, and visuals to enhance informational writing and oral presentations. (e29)
  - Gather information such as data, facts, ideas, concepts, and generalizations from oral sources. (e51)
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**Scoring Guide**

Attached

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**Attachments/  
Resources**Why Not Use Data to Persuade Your Audience!  
What Is a Ratio?

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**Standards****Source of Standards**

Florida

Big Idea 2: Connect ratio and rates to multiplication and division

MA.6.A.2.2 Interpret and compare ratios and rates.

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**Submitted by:**

# Scoring Guide

## Analytic - Variation 3

Score each of the following characteristics on a scale of **4** to **0**, where  
**4** = surpasses expectations; **3** = high-quality performance;  
**2** = satisfactory performance; **1** = minimum-quality performance;  
**0** = does not meet expectations

Criteria	Trial Scores				
	1	2	3	4	5
Student work provides evidence of understanding the use of part:part and part:whole ratios					
Student-produced advertisement is neat, complete, and handed in on time.					
Advertisement satisfies all stated requirements of project.					
Advertisement makes a good attempt at persuading the audience to accept the student's point of view					

Nine out of ten math teachers say . . .

## **Why Not Use Data to Persuade Your Audience!**

A quick Internet search resulted in these headlines:

**New Survey Shows Three Out of Four Diets Fail**

**More Than four Out of Five Smokers Want to Give Up Gigarettes, a Study Has Found.**

**Chinese Swimmers Win Four out of Seven Golds**

Chinese swimmers flexed their muscle Friday on the second day of competition in the World Military Games pool as they won four of seven tightly contested finals.

**Seven out of Ten Children Miss Necessary Eye Exams**

A national survey reveals lack of attention paid to eye care for children.

**IQ Measures Only Three out of Seven Types of Intelligence**

The United States Bureau of Labor Statistics provides an online description of the advertising industry in this country, including these statistics:

- There are over 21,000 advertising establishments in the United States.
- About 6 out of 10 write copy and prepare artwork, graphics, and other creative work, and then place the resulting ads in periodicals, newspapers, radio, television, or other advertising media.
- About 3 out of 10 advertising firms specialize in a particular market niche. Some companies produce outdoor advertising, such as billboards and electric displays. Buses, subways, taxis, airports, and bus terminals also frequently carry ads. A small number of firms produce aerial advertising, while others distribute circulars, handbills, and free samples.
- About 4 of 5 advertising firms employ fewer than 10 employees
- In advertising, managers and executives, professionals, sales workers, and administrative support workers account for 9 of every 10 jobs

Your assignment is to create an advertisement to try to persuade an audience to agree with your point of view. You are required to collect real data to support your position. Your advertisement must include the phrase *out of* to support your position.

Some suggestions for format:

- Create a color poster advertisement on presentation board
- Create a pop-up ad like you might see on the Internet
- Make a PowerPoint presentation
- Use MSWord or MSPublisher to create a print ad like you might see in a newspaper
- Make a video advertisement like those on television
- Record an audio advertisement like those on the radio
- Use an alternate format of your choice

Some suggestions for topics:

- Make an advertisement to try to sell a product.
- Make an advertisement trying to gain support for a candidate (for president of the class, for student council, for mayor of a city, for a new police chief, etc.)
- Make an advertisement to try to get attention focused on an event that will take place, like a homeroom contest or schoolwide fundraiser or an after school intramural sports competition or the spelling bee or . . .
- Make an advertisement that tries to get other people to change their minds about a controversial topic. Some examples: a smoking ban in public places, selling candy and soda in school, requiring vaccinations for all students, the school dress code, the school discipline policy, speed limits for cars, requiring a fishing license, . . .

Requirements:

- You have to create a survey to collect data about your topic from 20–50 people. This means that you have to come up with at least one question to ask them about your topic. Here are a few suggestions for yes-no questions:
  - Do you agree that there should be a ban on smoking in public places?
  - Do you think that the cafeteria should start selling soda and candy during lunch?
  - Should our state require that all students be vaccinated for measles before they can attend?
  - Should the school be allowed to ban students from wearing short-shorts?
  - Do you agree that students should be suspended for fighting?
  - Do you think that the speed limit on interstate highways should be raised to 90 mph?
  - Should students under the age of 12 be required to get a fishing license before they can go fishing?
- You have to use the phrase *out of* somewhere in your advertisement as a tactic that will be used to try to convince people that your opinion has been agreed with by a part-whole ratio of the people in your survey.
- Your actual data must appear somewhere in the ad, and your “*out of* statement” must express the actual data in lowest terms.
- Due date: \_\_\_\_\_

# What Is a Ratio?

A *ratio* is a comparison of two quantities in a specific order.  
There are three acceptable ways to write a ratio:

**A to B**

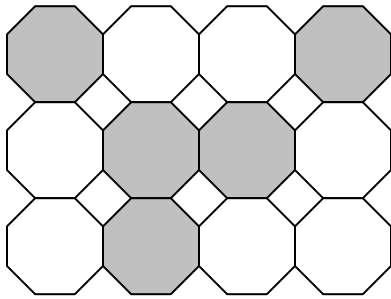
**A : B**

$\frac{A}{B}$

1.



Complete the ratios comparing specific shapes found in the diagram!  
Remember!! Order matters!



a) What is the ratio of gray octagons to white octagons? \_\_\_\_\_ : \_\_\_\_\_

b) Write a fraction that expresses the ratio of small squares to the total number of octagons.

\_\_\_\_\_

c) Use the word *to* to express the ratio of small squares to gray octagons.

\_\_\_\_\_ to \_\_\_\_\_

2. 63 children came to a party. 30 of them were boys.    **B : G : Total**  
\_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_

- a) What is the ratio of boys to girls? \_\_\_\_\_
- b) What is the ratio of girls to the total number of children? \_\_\_\_\_
- c) What is the ratio of the total number of children to boys? \_\_\_\_\_

3. There are 234 students in 8<sup>th</sup> grade. At the end of the year, 16 of them had failed 8<sup>th</sup> grade.    **P : F : Total**  
\_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_

- a) What is the ratio of passing to failing students? \_\_\_\_\_
- b) What is the ratio of passing students to the total? \_\_\_\_\_
- c) What is the ratio of failing students to the total? \_\_\_\_\_

4. Fertilizer is sold in mixtures. For instance, a 3-12-12 fertilizer means that it contains 3% nitrogen, 12% phosphorus and 12% potash. What is the ratio of nitrogen to phosphorus? \_\_\_\_\_

5. A survey showed that 4 out of 5 people preferred Brand A to Brand B.

A : B : Total

\_\_\_\_ : \_\_\_\_ : \_\_\_\_

a) If 50 people were interviewed, how many preferred Brand B? \_\_\_\_\_

b) If 8 people preferred Brand B, how many preferred Brand A?

6. A TV ad says that, "9 out of 10 dentists recommend sugarless gum to their patients who chew gum."

Do : Don't : Total

\_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_

a) If 900 dentists were surveyed, how many recommended sugarless gum? \_\_\_\_\_

b) If 72 dentists recommend sugarless gum, how many were surveyed? \_\_\_\_\_

c) If 120 dentists were surveyed, how many did not recommend sugarless gum? \_\_\_\_\_

d) If 25 dentists did not recommend sugarless gum, how many dentists did recommend it?

7. A survey showed that 9 out of 11 people preferred chunky peanut butter to creamy peanut butter.

Ch : Cr : Total

\_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_

- a) If 88 people were interviewed, how many preferred chunky peanut butter? \_\_\_\_\_
- b) If 120 people preferred creamy peanut butter, how many preferred chunky? \_\_\_\_\_
8. Blue and yellow paint are mixed to make green paint so that out of every 11 gallons of green paint, 4 are blue. If 49 gallons of yellow paint are used, how many gallons of blue paint must be added?

Blue : Yellow : Green

9. You really have to think about this one!!

At a recent high school dance, were sold this way:

- \$2 for a single person ticket -or-
- \$3 for each couple

12 out of 25 people attending the dance bought a "single" ticket. If 250 people attended the dance altogether, find the total amount of money collected.

Single : Couple : Total

\_\_\_\_\_ : \_\_\_\_\_ : \_\_\_\_\_