#10142
BASIC MATH: RATIOS-PERCENTS

CEREBELLUM CORPORATION, 2001
Grade Level: 5-8
8 mins.
2 Instructional Graphics Enclosed

DESCRIPTION

Ratios and percents are another way of looking at fractions and decimals. But exactly what is a ratio? And what is a percent? Definitions and examples help clarify these operations: finding ratios and converting fractions and decimals into percents. Standard Deviants School.

ACADEMIC STANDARDS

Subject Area: Mathematics

- Standard: Understands and applies basic and advanced properties of the concepts of numbers
  - Benchmark: Understands equivalent forms of basic percents, fractions, and decimals (e.g., 1/2 is equivalent to 50% is equivalent to .5) and when one form of a number might be more useful than another (See INSTRUCTIONAL GOALS 2 and 3.)
  - Benchmark: Understands the characteristics and properties (e.g., order relations, relative magnitude, base-ten place values) of the set of rational numbers and its subsets (e.g., whole numbers, fractions, decimals, integers) (See INSTRUCTIONAL GOALS 1.)
- Standard: Uses basic and advanced procedures while performing the processes of computation
  - Benchmark: Uses proportional reasoning to solve mathematical and real-world problems (e.g., involving equivalent fractions, equal ratios, constant rate of change, proportions, percents) (See INSTRUCTIONAL GOALS 4.)

INSTRUCTIONAL GOALS

1. To define *ratio* and *percent*.
2. To explain how to change decimals to percents.
3. To show how to change a fraction to a percent.
4. To point out examples using ratio and percent.

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VOCABULARY

1. cappuccino
2. colon
3. comparison
4. convert
5. decimal
6. denominator
7. dividend
8. divisor
9. espresso
10. jujitsu
11. numerator
12. percentage
13. ratio
14. reduce
15. relationships
16. represents
17. round (verb)

BEFORE SHOWING

1. Review the parts of a fraction. List and give examples of the different kinds of fractions.
2. Obtain a list of beverages sold in a local coffee shop. Discuss the various kinds of coffee: espresso, latte, cappuccino, café mocha, café au lait, etc.
3. List situations where it is important to compare numbers (e.g., number of games lost compared with games won, number of problems correct on a test compared with total problems, etc.).
4. List practical situations for using fractions, decimals, and percents. Discuss when it is more convenient to use each.
5. Review multiplying numbers by 10, 100, and 1000.
6. Review rounding decimals.

DURING SHOWING

1. View the video more than once, with one showing uninterrupted.
2. Pause at the section showing the colon being placed in a ratio. Discuss the different ways ratios can be written (i.e., colon, with the word "to," fraction, and decimal).
3. Pause at the section about jujitsu and handball. Display pictures of each sport and briefly explain how they are played.
4. Pause at the sections explaining how to convert 27/55 to a decimal.
   a. Review the meanings of divisor and dividend.
   b. Point out that the dividend is not always larger than the divisor.
   c. Show examples of fractions where the denominator is larger than the numerator and vice versa. Convert to decimals, and compare the answers.

AFTER SHOWING

Discussion Items and Questions

1. How are relationships expressed in math?
2. Is order important in a ratio or can the numbers be reversed?
3. What do the numerator and denominator in a fraction represent?
4. How is a fraction changed to a decimal?
5. What is the Latin meaning of "percent"?
6. When a percent is changed to a fraction, what is the denominator?
7. How is a decimal changed to a percent?
8. How is a fraction changed to a percent?

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Applications and Activities

1. Research and make a list of math words that have Latin origin and write their meanings.
   a. Decimal (tenth).
   b. Circumference (around).
   c. Triangle (three).
   d. Bisect (two).
2. In the video, a *ratio* is defined as a "relationship between quantities." Select a partner, and make a list of other definitions of ratio. Illustrate the definitions with drawings or graphics.
3. Complete a worksheet on ratios. (See INSTRUCTIONAL GRAPHICS.)
4. Develop a slide show on "Trivial Ratios." Define ratio and write examples of ratios. Some suggestions are:
   a. Age compared with shoe size.
   b. Number of deaf teachers in the school compared with the number of hearing teachers.
   c. Number of students preferring a certain brand of toothpaste compared with those favoring other brands.
   d. Number of red M&M'S compared to the number of blue M&M'S in a bag.
   e. Length of nose compared with length of ear.
5. The video defines *percent* as meaning "per hundred." Select a partner, and make a list of other definitions of percent. Illustrate the definitions with drawings or graphics.
6. Complete a worksheet on percents. (See INSTRUCTIONAL GRAPHICS.)
7. Make illustrated visuals showing how to convert a fraction to a decimal, a decimal to a percent, and a fraction to a percent. Use a variety of formats:
   a. Posters.
   b. Computer-generated tables or charts.
   c. Cartoon strips with callouts explaining the steps.
   d. Slide show.
   e. Videotape.
   f. Digital camera sequences.
8. Divide into small groups, and create word problems involving ratios and percents. Exchange problems with another group and solve. Examples are:
   a. On a math test, Holly got 29 problems correct out of 34. On her reading test she got 15 problems correct out of 18. On which test did she receive the better score?
   b. Antonio made 14 out of 25 free throw attempts today. He plans to practice 35 free throws tomorrow. How many free throws must he make to equal or better his percentage today?
9. Divide into groups of two. Find the percentages of the various colors of M&M'S in a bag. Compare the results with those of other groups.
10. Research and report on applications of ratios (e.g., ratio of nitrogen, phosphorus, and potassium in fertilizer, ratio of parts of red and yellow to make a certain shade of orange).

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11. Plan and prepare a refreshment for the class that involves ratios (e.g., ratio of ginger ale to fruit drink in a punch; ratios of nuts, raisins, and chocolate chips in trail mix, etc.).

CMP RELATED RESOURCES

- *Percentages that Make Sense* #9548

World Wide Web

The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid safe" sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **RATIO** http://www.math.com/school/subject1/lessons/S1U2L1GL.html

Explains how ratios can be written in different ways, and includes an interactive section to practice writing them.

- **ALL ABOUT RATIOS** http://math.rice.edu/~lanius/proportions/

Includes interactive practices for writing ratios and concludes with a quiz.

- **MRS. GLOSSER'S MATH GOODIES**

http://www.mathgoodies.com/lessons/vol4/percents_to_decimals.html

Includes interactive sections on the meaning of percent and percent conversions.

- **WEBMATH (GET HELP WITH RATIOS)**

http://www.webmath.com/k8ratio.html

Click in two numbers to compare and this Web site provides information about the ratio of these two numbers.

INSTRUCTIONAL GRAPHICS

- RATIO
- PERCENT

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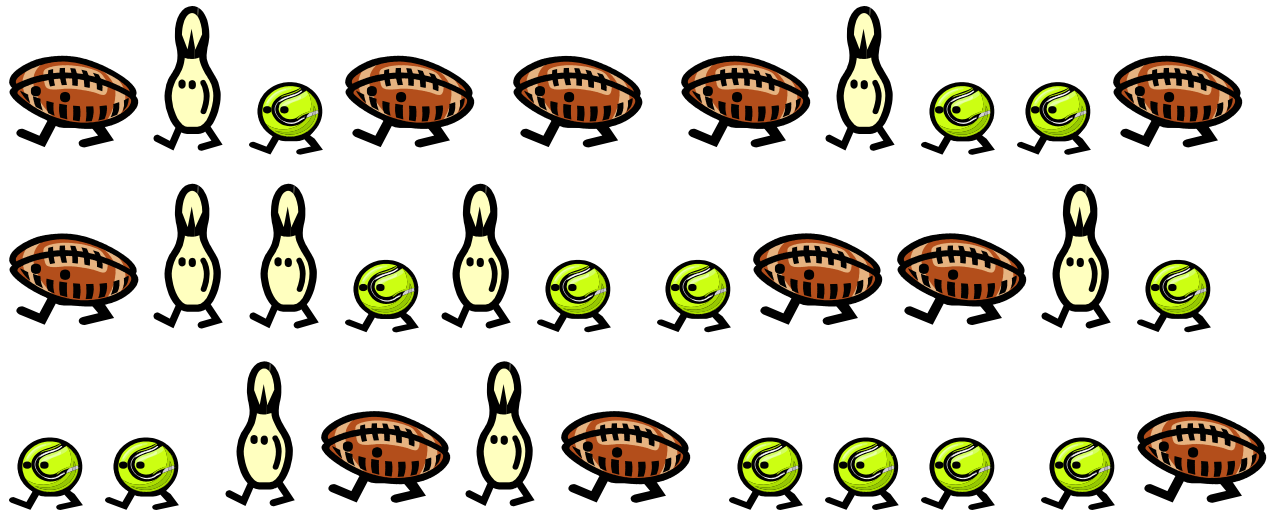
Ratio

Mr. Reed's gym class took a poll to see which sports they wanted to learn in class. The results are:



Questions:

1. What is the total number of students who voted?

2. What is the ratio of those preferring tennis to the total? Write this ratio two other ways.

3. What is the ratio of those preferring football to those preferring bowling?

4. What is the ratio of those preferring tennis to those preferring football?

5. What is the ratio of those preferring bowling to the total?

6. Three students were absent the day of the poll. Two of the students preferred football and one preferred bowling. Answer questions 1-5 using the new totals.

7. Which sport do you prefer play and why?

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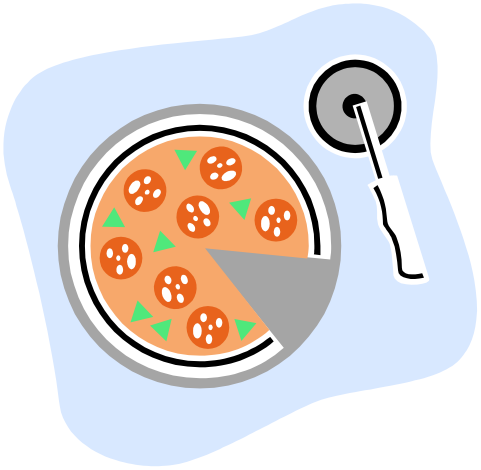

Percent

Mr. Martin's math class is planning a pizza party. The students voted on which kind of pizza to order. Fourteen of the students prefer pepperoni pizza, while eight students prefer the combo pizza.

1. What is the total number of students?
2. What percent of the students prefer pepperoni pizza?
3. What percent of the students prefer combo pizza?
4. Four students were absent the day the vote was taken. All four of them prefer sausage pizza. Find the following percentages with the new total:
   a. Pepperoni
   b. Combo
   c. Sausage

5. Which pizza do you prefer?
6. Using a different topic, write your own word problem and calculate the percents.

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