Grade 7

Number Sense and Numeration: Ratios, Rate and Percentages

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Play the **Percentage P.I game** first.
Click on *http://funschool.kaboose.com/formula-fusion/games/game_percentage_pi.html* to play.
You may also go to *www.wiredmath.ca* for the link.

1. Write each ratio as a decimal, a fraction in lowest terms and as a percent.

Ratio	Fraction	Decimal	Percent
1:4			
8:10			
18:25			
42:50			

2. Write each percent as a decimal, a fraction in lowest terms and as a ratio.

Percent	Decimal	Fraction	Ratio
10%			
25%			
90%			
120%			

3. Arrange the following numbers in ascending order.

$0.23 \qquad \frac{2}{3} \qquad \frac{4}{5} \qquad 18\% \qquad 0.38$

4. Arrange the following numbers in descending order.

$\frac{1}{10} \qquad 12\% \qquad 0.22 \qquad \frac{2}{25} \qquad 0.14$

5. Answer the following questions.

a. What number is 75% of 20?
b. 3 is what percent of 12?
c. 60% of what number is 12?
d. What number is 40% of 125?
e. 34 is what percent of 272?
f. 80% of what number is 120?

Expectations: i) compare different numbers in form of decimal, fraction and percent. Solve multi-steps problems involving fraction, ratio and percents related to real life experiences. *For more activities and resources from the University of Waterloo's Faculty of Mathematics, please visit www.cemc.uwaterloo.ca.*

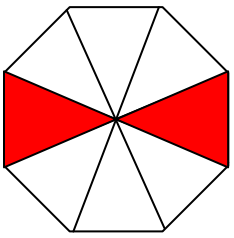
A **ratio** is used to compare two or more numbers.

» E.g. To compare 30 and 20 we use the ratio 30:20, which is read 30 to 20.

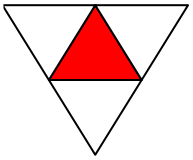
Percent means parts per hundred and is denoted by the symbol %.

» E.g. A ratio of 1:2 is equivalent to 50:100 and can be expressed as 50%.

6. a. What fraction of the regular octagon is shaded?
   b. Express your answer as a ratio.
   c. Express your answer as a percentage.



7. *i.*



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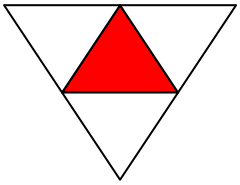
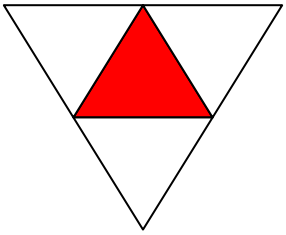


iii.



   a. What percentage of triangle *(i)* is shaded?
   b. What percentage of the triangle *(ii)* is shaded?
   c. What percentage of the triangle *(iii) is* shaded?
   d. Are the shaded areas equal for the diagrams above?

8. The doctor took Marjorie's pulse. He counted 5 beats in 4 seconds. What was Marjorie's heart rate in beats per minute?

9. Janice builds a model tank using a scale of 2 cm to represent 3 m. William says she is using a ratio of 2:3. Is William correct? Explain.

10. A tennis court is 24 m in length and 8 m in width. A soccer field is 100 m in length and 48 m in width.
    a. What percent of the soccer field does a tennis court represent?
    b. How many tennis courts can fit on the soccer field?

11. The following ingredients are needed to make a cake that will serve 12 people. How much of each ingredient is needed to make a cake for 4 people?
    a. 300 g whole-wheat flour
    b. 200 g sugar
    c. 120 g margarine
    d. 250 g rolled oats
    e. 24 spoons of syrup

12. This year's school population in Waterloo is 135 percent of last year's school population. This year's student population is 756. How many students did the school have last year?

13.

i.

2 out of 3

People Surveyed
Preferred
Hot Buttered
POPCORN

iii.

7036 out of 10554

People Surveyed
Preferred
Hot Buttered

ii.

Twice as

Many People
Preferred
Hot Buttered
POPCORN

iv.

3518 more

People Surveyed
Preferred
Hot Buttered
POPCORN

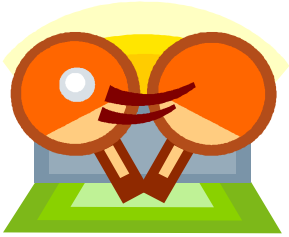
a. From the information in each advertisement, if possible write a ratio to represent those people who liked hot buttered popcorn to those who did not.
b. Which advertisement is most effective? Use the ratios from part a) to explain.

Did You Know?

The **foreign-exchange rate** between two currencies specifies how much one currency is worth in terms of the other. For example, the exchange rate between CAD and USD is 1:1.09 as of November 9, 2007, meaning each 1 CAD is worth 1.09 USD. The following chart indicates the historical foreign exchange rate between CAD and USD from January 1, 2002 to December 1, 2007.

CHALLENGE YOURSELF!

14. There is a full cup of milk on the desk. Ian drinks one third of the cup of milk and then refills the cup with water. Then, Ian drinks another one third of the cup. In total, how much pure milk has he drank?



15. Mary and James are playing table tennis. At present, the score is 14 for Mary to 7 for James. To win a game, a player needs 15 points. As James is just about to lose the game, he asks Mary to reduce the actual score to the ratio 2 to 1 since the score represents the same ratio as 14 to 7. Should Mary agree to this proposal? Explain.

EXTENSION!

16. Wallace and Tina are working together to complete a task. It takes 12 days for Wallace and Tina to finish the task. It takes 20 days for Wallace alone. How many days does Tina need to complete the task by herself?

Don't forget now! Go to *www.wiredmath.ca* for the link.

TRY THESE!

Find the missing terms.

http://www.mathgoodies.com/lessons/vol4/challenge_vol4.html