

Exploring Ratios



Quick Review

A **ratio** is a comparison of 2 quantities with the same unit.

Here are 3 squares and 5 circles.



Here are some ways to compare the shapes.

► **Part-to-Part Ratios**

- squares to circles is 3 to 5 or 3 : 5.
- circles to squares is 5 to 3 or 5 : 3.

The numbers 3 and 5 are the **terms of the ratio**.

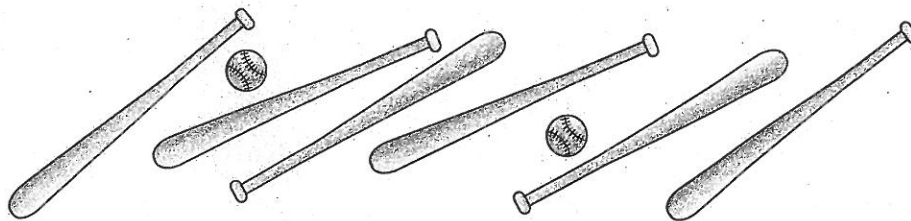
► **Part-to-Whole Ratios**

- squares to shapes is 3 to 8 or 3 : 8 or $\frac{3}{8}$.
- circles to shapes is 5 to 8 or 5 : 8 or $\frac{5}{8}$.

You can write a part-to-whole ratio as a fraction.

Try These

1. Write each ratio in as many ways as you can.



- a) balls to bats _____
- b) bats to balls _____
- c) balls to all toys _____
- d) bats to all toys _____

Practice

1. Use the numbers in the box to write each ratio.

- a) odd numbers to even numbers _____
 b) numbers less than 20 to all numbers _____
 c) multiples of 5 to multiples of 7 _____
 d) prime numbers to composite numbers _____

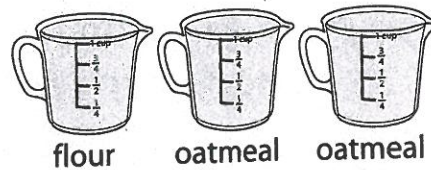
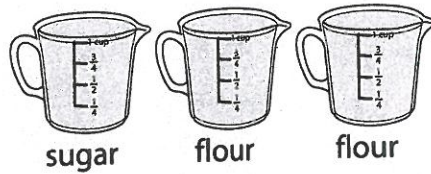
25	16	13	38
17	30	49	3
24	45	7	14

2. Write a word that has each ratio of vowels to consonants.

- a) 2:5 _____ b) 1:4 _____ c) 4:6 _____

3. What is being compared in each ratio?

- a) 1 to 2 _____
 b) 2:6 _____
 c) 2:3 _____
 d) $\frac{1}{6}$ _____
 e) $\frac{3}{6}$ _____



4. Draw some acorns and some oak leaves. Write as many ratios as you can for your drawing.

Stretch Your Thinking

Ask 5 people to name the sport they enjoy watching the most.

Write as many ratios as you can to compare the responses.

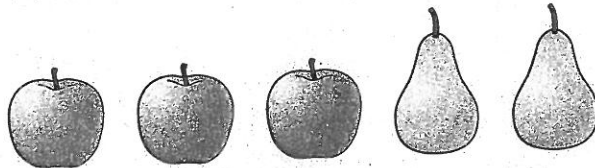
Tell what each ratio compares.

Equivalent Ratios

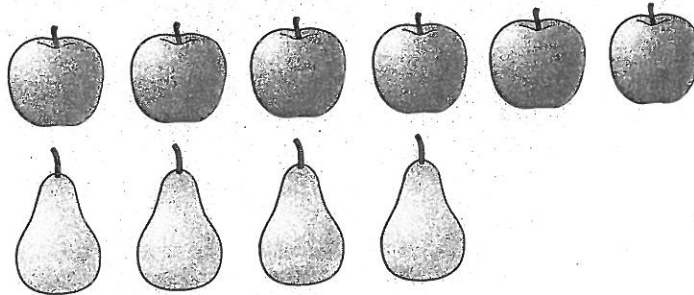


Quick Review

► The ratio 3 : 2 means that for every 3 apples there are 2 pears.



The ratio 6 : 4 means that for every 6 apples there are 4 pears.
3 : 2 and 6 : 4 are equal. 3 : 2 and 6 : 4 are **equivalent ratios**.



► You can use a table and patterns to find equivalent ratios.
The numbers in the Apples column are multiples of 3.
The numbers in the Pears column are multiples of 2.
The ratios of apples to pears are:
3 : 2, 6 : 4, 9 : 6, 12 : 8, 15 : 10, ...

Apples	Pears	Ratio
3	2	3 : 2
6	4	6 : 4
9	6	9 : 6
12	8	12 : 8
15	10	15 : 10

Try These

1. Write 2 equivalent ratios for each ratio.

- a) 5 : 3 _____ b) 7 : 4 _____ c) 3 : 9 _____
d) 4 : 11 _____ e) 2 : 6 _____ f) 8 : 5 _____

Practice

- Play this game with a partner.
You will need 2 sheets of paper and a clock or watch with a second hand.
 - ▶ Player A chooses a ratio and writes as many equivalent ratios as she can, as Player B times 30 s.
 - ▶ Both players check Player A's ratios.
 - ▶ Player A gets 1 point for each correct ratio.
 - ▶ Players switch roles and play again, using a different ratio.
 - ▶ The player with the most points after 5 rounds wins.

Ratios	
3:7	7:4
2:5	2:9
6:3	12:11
4:3	10:15
8:6	3:8

- Write an equivalent ratio with 30 as one of the terms.

- a) 15:7 _____ b) 8:5 _____ c) 2:6 _____ d) 3:14 _____
 e) 11:5 _____ f) 3:2 _____ g) 4:10 _____ h) 18:15 _____

- List all the ratios that are equivalent to 4:7 and have a first term that is less than 25. _____

- Jillian is planting 4 roses for every 3 daisies in her garden.
Complete the table to show how many daisies Jillian needs for 8, 12, and 16 roses.
Write each ratio.

Roses	Daisies	Ratio
4	3	

Stretch Your Thinking

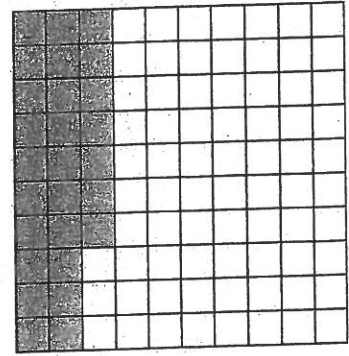
Mr. Tanaka has 56 students in his choir. The ratio of boys to girls is 3:4. How many boys and how many girls are in Mr. Tanaka's choir? Explain.

Exploring Percents



Quick Review

This hundredths grid has 100 small squares. Each square represents $\frac{1}{100}$ of the grid. Twenty-seven squares are shaded.



You can describe the shaded part of the grid.

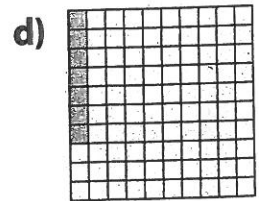
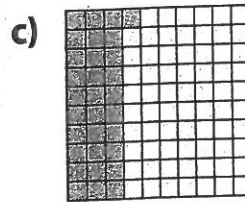
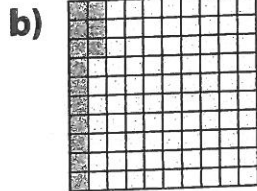
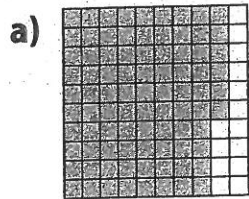
- 27 out of 100 squares are shaded.
- $\frac{27}{100}$ of the grid is shaded.
- 0.27 of the grid is shaded.
- 27% of the grid is shaded.

Percent means "per hundred" or "out of 100."

This is a **percent** symbol. You read 27% as 27 percent.

Try These

1. Write a fraction with hundredths, a decimal, and a percent to describe the shaded part of each grid.



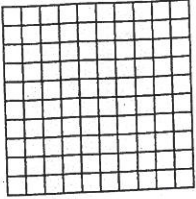
2. Write a fraction with hundredths, a decimal, and a percent to describe the unshaded part of each grid in question 1.

a) _____ b) _____ c) _____ d) _____

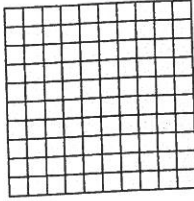
Practice

1. Colour each hundredths grid to show the percent.

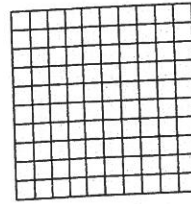
a) 42%



b) 75%



c) 6%



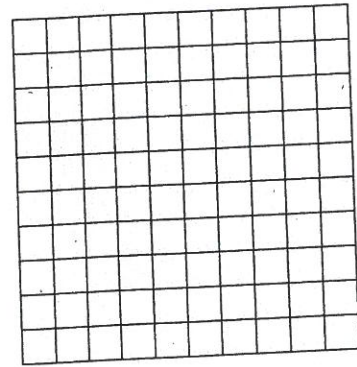
2. a) Use the hundredths grid. Colour 35% blue, 7% red, 40% green, and the rest orange.

b) Write a fraction and a decimal to describe each colour.

blue _____ red _____

green _____ orange _____

c) What percent is orange? _____



3. Write as a percent and as a decimal.

a) $\frac{43}{100}$ _____

b) $\frac{16}{100}$ _____

c) $\frac{100}{100}$ _____

d) $\frac{3}{100}$ _____

e) $\frac{82}{100}$ _____

f) $\frac{11}{100}$ _____

4. Write as a fraction and as a decimal.

a) 19% _____

b) 1% _____

c) 93% _____

d) 7% _____

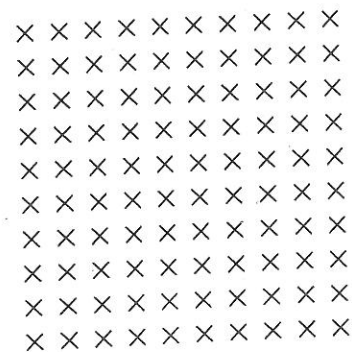
e) 100% _____

f) 47% _____

Stretch Your Thinking

Draw a rectangle and an oval around groups of Xs so that all of the following statements are true.

- 64% of the Xs are not inside either figure.
- 8% of the Xs are inside both figures.
- 20% of the Xs are inside the rectangle only.
- 8% of the Xs are inside the oval only.

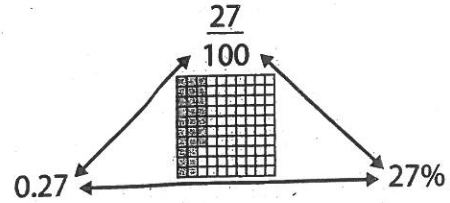


Relating Fractions, Decimals, and Percents

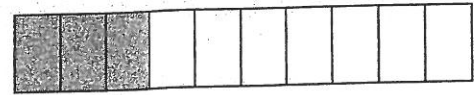
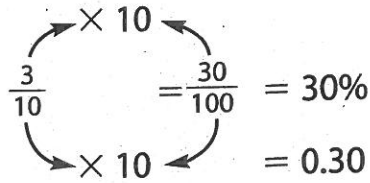


Quick Review

Fractions, decimals, and percents are 3 ways to describe parts of a whole.

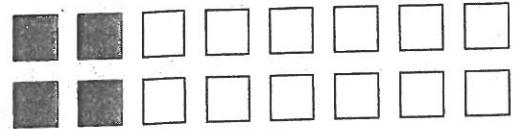
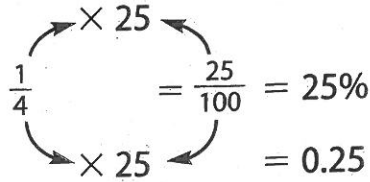


➤ $\frac{3}{10}$ of this shape is shaded.



30% of the shape is shaded.

➤ $\frac{1}{4}$ of the squares are shaded.



25% of the squares are shaded.

Try These

1. Write each fraction as a percent and as a decimal.

a) $\frac{9}{100}$ _____

b) $\frac{7}{10}$ _____

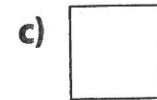
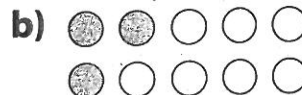
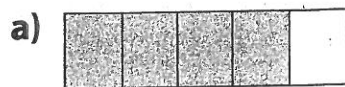
c) $\frac{4}{25}$ _____

d) $\frac{1}{5}$ _____

e) $\frac{7}{50}$ _____

f) $\frac{11}{20}$ _____

2. What percent is shaded?

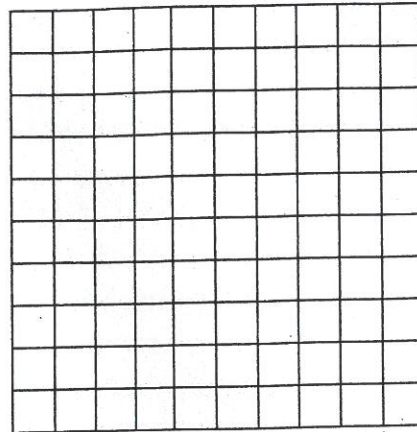


Practice

1. a) Use the hundredths grid to make a design.

Follow these rules:

- You can use only red, black, green, and blue.
- You must colour at least $\frac{7}{10}$ of the squares.
- You must use:
 - red for at least 6% of the squares.
 - black for at least 5% of the squares.
 - green and blue together for at least 0.4 of the squares.



b) Complete the chart to describe the colours in your design.

Colour	Red	Black	Green	Blue	No Colour
Number of Squares					
Fraction					
Decimal					
Percent of Grid					

c) What is the greatest percent of blank squares you could have in your design? Explain.

d) What is the sum of your decimals? _____ Percents? _____

What do you think the sum of your fractions would be? _____

Stretch Your Thinking

What percent of Canada's 10 provinces begin with a vowel? With a consonant? Explain.
