Objective   Introduction to Ratio and Rate Reasoning

Warm-Up

Write a fraction to represent each situation.

1. the number of students in your math class that are absent today compared to the total number of
students in the class

2. the number of students in your math class that are in attendance today compared to the total number of students in your class

The Lanterton Middle School is adopting a new nickname. They have narrowed their search to the following two names: Tigers or Lions. To choose a nickname, they conducted a school-wide survey and tallied all the votes.

Each homeroom analyzed the results of the school-wide survey and reported the results in a different way.

Homeroom 6A	Homeroom 6B
The votes for Tigers outnumbered the votes for Lions by a ratio of 240 to 160.	There were 80 more votes for Tigers than Lions.
Homeroom 7A	**Homeroom 7B**
The votes for Tigers outnumbered votes for Lions by a ratio of 3 to 2.	3 out of 5 votes were for Tigers.

1. Describe the meaning of each statement. Then identify which describe ratios, and if so, whether the ratios are part-to-part or part-to-whole ratios.

Let's consider the results reported by Homeroom 7A:
"The votes for Tigers outnumbered votes for Lions by a ratio of 3 to 2."

This comparison is an example of a part-to-part ratio expressed in words. There are two other ways you can express this part-to-part ratio.

With a Colon

3 votes for Tigers : 2 votes for Lions

In Fractional Form

$\dfrac{3 \text{ votes for Tigers}}{2 \text{ votes for Lions}}$

Next, let's consider the results of the student vote as reported by Homeroom 7B: "3 out of 5 votes were for Tigers."

2. Complete the part-to-whole and part-to-part ratios written in words. Then write each ratio with a colon and in fractional form. Label all quantities.

Part-to-Whole Ratio

In Words	With a Colon	In Fractional Form
3 out of 5 votes were for Tigers.		
_____ out of 5 votes were for Lions.		

Part-to-Part Ratio

In Words	With a Colon	In Fractional Form
_____ votes for Tigers for every 2 votes for Lions.		
2 votes for Lions for every _____ votes for Tigers.		

Finally, let's consider the results of the survey as reported by Homeroom 6A: "The votes for Tigers outnumbered the votes for Lions by a ratio of 240 to 160.

3. Complete the part-to-whole and part-to-part ratios written in words. Then write each ratio with a colon and in fractional form. Label all quantities.

Part-to-Whole Ratio

In Words	With a Colon	In Fractional Form
____ votes out of ____ votes were for Tigers.		
____ votes out of ____ votes were for Lions.		

Part-to-Part Ratio

In Words	With a Colon	In Fractional Form
____ votes for Tigers ____ votes for Lions.		
____ votes for Lions ____ votes for Tigers.		

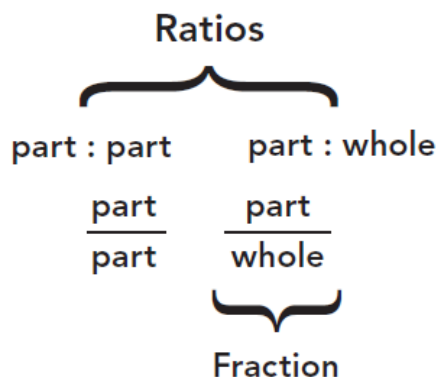4. Based on the survey, which mascot name was preferred?

Consider each statement.

- There is an 80 percent chance of rain tomorrow.
- He ate $\frac{2}{5}$ of the cake.
- Sales tax in Greenmont is 7 percent.
- Three-fourths of the class is absent.

The situations described are examples of special types of ratios: fractions and percents.

Notice that when you write a ratio using the total number of parts, you are also writing a fraction. A fraction can be used as a ratio that shows a part-to-whole relationship.

Ratios

part : part   part : whole

$$\frac{part}{part} \qquad \frac{part}{whole}$$

Fraction

A percent is a part-to-whole ratio where the whole is equal to 100.

Percent is another name for hundredths. The percent symbol "%" means "per 100," or "out of 100."
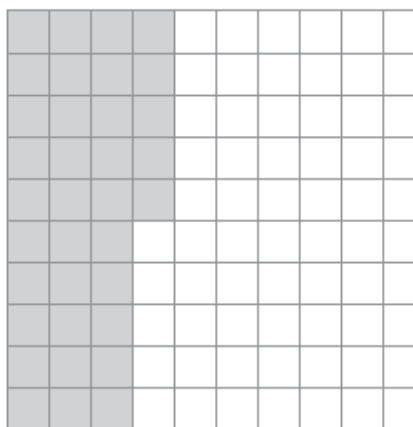
Therefore:

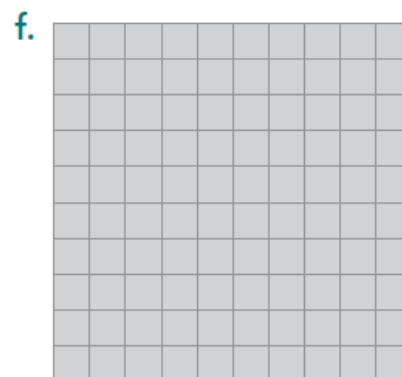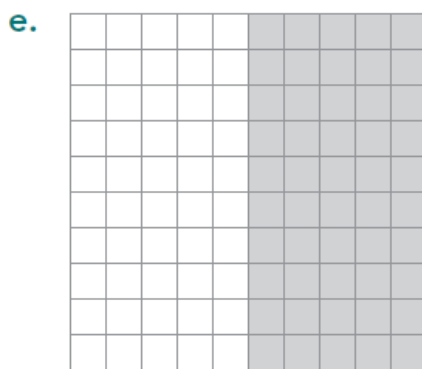35% means 35 out of 100.

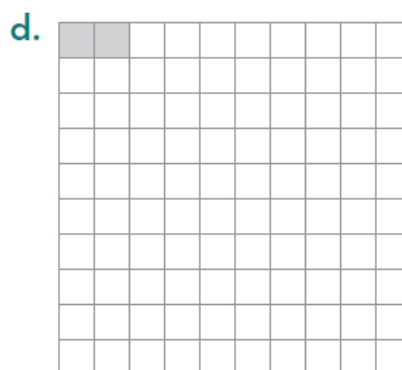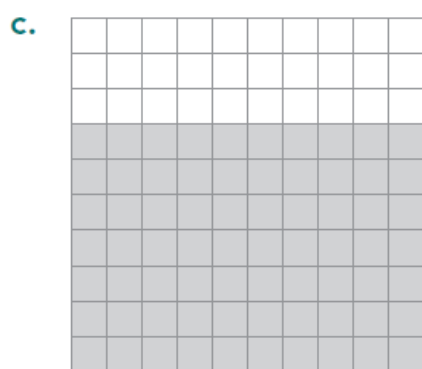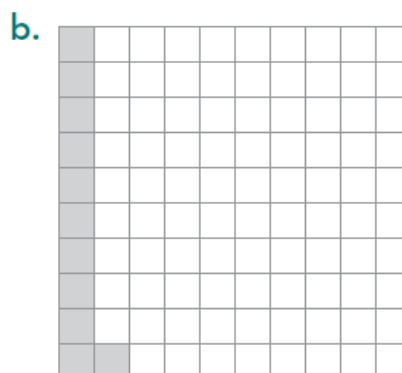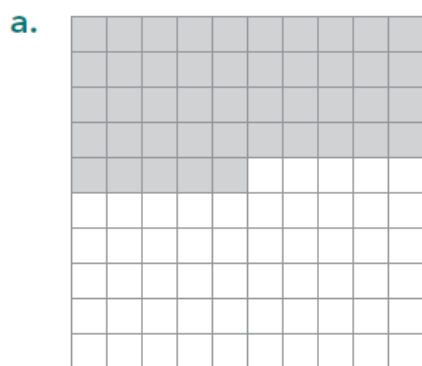35% as a fraction is $\frac{35}{100}$.

35% as a decimal is 0.35.

35% as a ratio is 35 to 100, or 35 : 100.

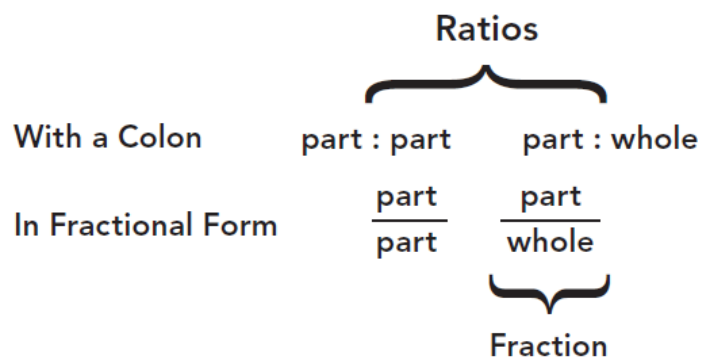You can shade 35 of the 100 squares on the hundredths grid to represent 35%.

1. Each hundredths grid represents a whole. Write a fraction and a percent to represent the shaded part of each grid.

a.

b.

c.

d.

e.

f.

Writing and Classifying Ratios

There are several ways to compare two quantities and write ratios.

Ratios

With a Colon	part : part	part : whole
In Fractional Form	$\dfrac{part}{part}$	$\dfrac{part}{whole}$

Fraction

1. Consider the statement: There are s sixth grade band members and t total sixth graders.
a. Write a part-to-whole ratio using colon notation.

b. Write a part-to-part ratio using colon notation.

LESSON 4.1b
It's All Relative

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Practice

The Lewis brothers just joined MovieQ, a club that provides them with free movies based on a list that they pre-select. The boys work together to pick the first 10 movies for their list, each brother adding to the list based on their favorite type of movie. John David puts 5 sports movies on the list; Parker chooses 3 war movies; and Stephen adds 2 comedies.

Write the ratio in colon and in fractional form to express each relationship.

1. sports movies to war movies
2. comedies to total movies
3. war movies to comedies
4. sports movies to total movies
5. comedies to sports movies
6. war movies to total movies