Chapter 15

RATIOS

A **RATIO** is a comparison of two quantities. For example, you might use a ratio to compare the number of students who have cell phones to the number of students who don't have cell phones. A ratio can be written a few different ways.

The ratio 3 to 2 can be written:

$3:2$ or $\frac{3}{2}$ or 3 to 2

Use "a" to represent the first quantity and "b" to represent the second quantity. The ratio a to b can be written:

$a:b$ or $\frac{a}{b}$ or a to b

A fraction can also be a ratio.

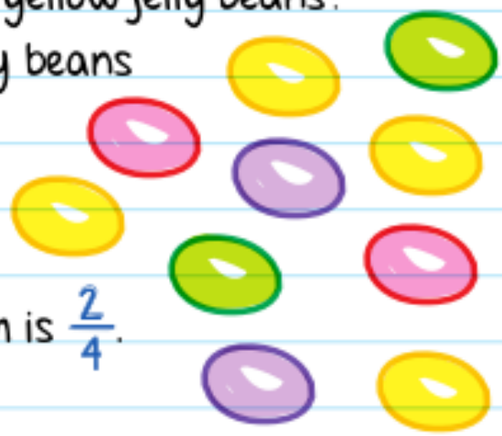
EXAMPLES: Five students were asked if they have a cell phone. Four said yes and one said no. What is the ratio of students who do not have cell phones to students who do?

1:4 or $\frac{1}{4}$ or 1 to 4. (Another way to say this is, "For every 1 student who does not have a cell phone, there are 4 students who do have a cell phone.")

What is the ratio of students who have cell phones to total number of students asked?

4:5 or $\frac{4}{5}$ or 4 to 5.

EXAMPLE: Julio opens a small bag of jelly beans and counts them. He counts 10 total. Among those 10, there are 2 green jelly beans and 4 yellow jelly beans. What is the ratio of green jelly beans to yellow jelly beans? And what is the ratio of green jelly beans to total number of jelly beans?



The ratio of green jelly beans to yellow jelly beans in fraction form is $\frac{2}{4}$. That can be simplified to $\frac{1}{2}$.

So, for every 1 green jelly bean, there are 2 yellow jelly beans.

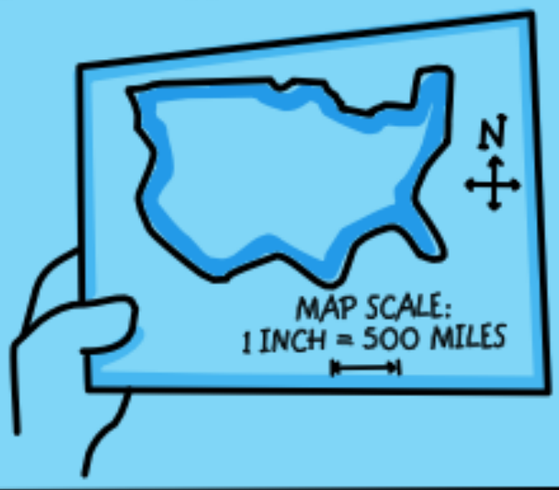
The ratio of green jelly beans to the total amount is $\frac{2}{10}$.

That can be simplified to $\frac{1}{5}$.

So, 1 out of every 5 jelly beans in the bag is green.

Just like you simplify fractions, you can also simplify ratios!

Ratios are often used to make **SCALE DRAWINGS** — a drawing that is similar to an actual object or place but bigger or smaller.



A map shows the ratio of the distance on the map to the distance in the real world.

CHECK YOUR KNOWLEDGE

For **1** through **6**, write each ratio as a fraction. Simplify if possible.

1. 2:9
2. 42:52
3. 5 to 30
4. For every 100 apples, 22 apples are rotten.
5. 16 black cars to every 2 red cars
6. 19:37

For **7** through **10**, write a ratio in the format of *a*:*b* to describe each situation.

7. Of the 27 people surveyed, 14 live in apartment buildings.
8. In the sixth grade, there are 8 girls to every 10 boys.
9. Exactly 84 out of every 100 homes has a computer.
10. Lucinda bought school supplies for class. She bought 8 pens, 12 pencils, and 4 highlighters. What was the ratio of pens to total items?

ANSWERS

CHECK YOUR ANSWERS

1. $\frac{2}{9}$
2. $\frac{21}{26}$
3. $\frac{1}{6}$
4. $\frac{11}{50}$
5. $\frac{8}{1}$
6. $\frac{19}{37}$
7. 14:27
8. 8:10 or 4:5
9. 21:25
10. 8:24 or 1:3