

BARTLETT

NAME

DATE

PERIOD

Unit 4, Lesson 2: Ratios and Rates With Fractions

Let's calculate some rates with fractions.

2.1: Number Talk: Division

Find each quotient mentally.

*one problem at a time
30 sec. think
then call on student*

$5 \div \frac{1}{3} = 15$

$2 \div \frac{1}{3} = 6$

$\frac{1}{2} \div \frac{1}{3} = 1.5$ or $1\frac{1}{2}$ or $\frac{3}{2}$

$2\frac{1}{2} \div \frac{1}{3} = 7.5$ or $7\frac{1}{2}$ or $6\frac{3}{2}$

÷ 2

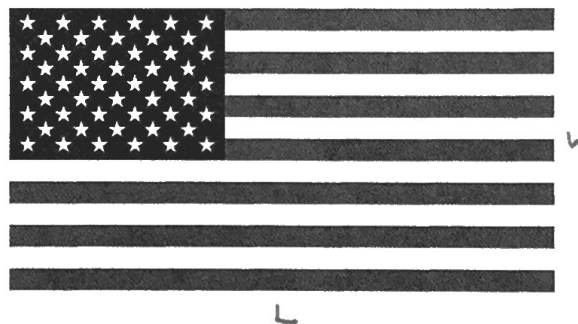
Unit 4, Lesson 1: Lots of Flags

Let's explore the U.S. flag.

*Looking at Area
L x W*

1.3: What Percentage Is the Union?

One standard size for the United States flag is 19 feet by 10 feet. On a flag of this size, the union (the blue rectangle in the top-left corner) is $7\frac{5}{8}$ feet by $5\frac{3}{8}$ feet.



On a U.S. flag that is 19 feet by 10 feet, the union is $7\frac{5}{8}$ feet by $5\frac{3}{8}$ feet. For each question, first estimate the answer and then compute the actual percentage.

1. What percentage of the flag is taken up by the union?

~ 20%

Area of flag (union) ~ 41 sq. ft.

Area of flag ~ 190

• 21.6%

$\frac{41}{190} = \frac{41.000}{190 \overline{) 41.000}} \approx 0.216$

2. What percentage of the flag is red? Be prepared to share your reasoning.

~ 40%

The red half of outside area is half the remaining percentage.

• 39.2%

$\frac{1 - 0.216}{2} = 0.392$

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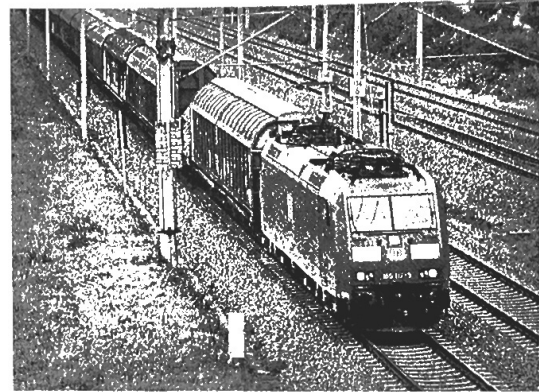
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3 min. quiet work, pair-share, whole class.

2.2: A Train is Traveling at . . .

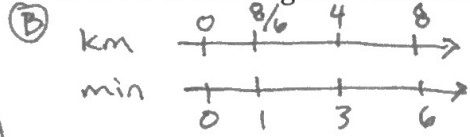
A train is traveling at a constant speed and goes 7.5 kilometers in 6 minutes. At that rate:



(A) $\frac{15}{2} \div 6 = \frac{5}{4}$
 (B) double number line
 (C) table of equivalent ratios

$\frac{1}{4}$ km
 or $\frac{5}{4}$ km

1. How far does the train go in 1 minute?



(C)

km	min
7.5	6
$\frac{5}{4}$	1

2. How far does the train go in 100 minutes?

125 km in 100 mins.

(C)

km	min
7.5	6
$\frac{5}{4}$	1
$\frac{500}{4}$	100

(A) $\frac{5}{4} \cdot 100 = \frac{500}{4} = 125$

2.3: Comparing Running Speeds

Lin ran $2\frac{3}{4}$ miles in $\frac{2}{5}$ of an hour. Noah ran $8\frac{2}{3}$ miles in $\frac{4}{3}$ of an hour.

1. Pick one of the questions that was displayed, but don't tell anyone which question you picked. Find the answer to the question.

Notice & wonder about 2 statements.
 Use "wonder" to collect/generate questions

Potential Q's:

- Who ran faster?
- How far does Lin run in 1 hr?
- How far does Noah run in 1 hr?
- How long does it take Lin to run 1 mile @ that rate? Noah?

$\frac{8\frac{2}{3}}{1\frac{1}{3} \text{ hr}}$ Lin ran faster $\frac{6\frac{7}{8} \text{ mi.}}{1 \text{ hr}}$
 $\frac{9\frac{3}{5}}{2\frac{1}{3} \text{ hr}}$ Noah ran slower $\frac{6\frac{1}{2} \text{ mi.}}{1 \text{ hr}}$

2. When you and your partner are both done, share the answer you got (do not share the question) and ask your partner to guess which question you answered. If your partner can't guess, explain the process you used to answer the question.

mostly discussion-based

3. Switch with your partner and take a turn guessing the question that your partner answered.

Share strategies following

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Lesson 1 Summary

Imagine you have a painting that is 15 feet wide and 5 feet high. To sketch a scaled copy of the painting, the ratio of the width and height of a scaled copy must be equivalent to $15 : 5$. What is the height of a scaled copy that is 2 feet across?

width	height
15	5
2	h

We know that the height is $\frac{1}{3}$ the width, so $h = \frac{1}{3} \cdot 2$ or $\frac{2}{3}$.

Sometimes ratios include fractions and decimals. We will be working with these kinds of ratios in the next few lessons.

Lesson 2 Summary

There are 12 inches in a foot, so we can say that for every 1 foot, there are 12 inches, or the ratio of feet to inches is $1 : 12$. We can find the unit rates by dividing the numbers in the ratio:

$1 \div 12 = \frac{1}{12}$
so there is $\frac{1}{12}$ foot per inch.

$12 \div 1 = 12$
so there are 12 inches per foot.

The numbers in a ratio can be fractions, and we calculate the unit rates the same way: by dividing the numbers in the ratio. For example, if someone runs $\frac{3}{4}$ mile in $\frac{11}{2}$ minutes, the ratio of minutes to miles is $\frac{11}{2} : \frac{3}{4}$.

$\frac{11}{2} \div \frac{3}{4} = \frac{22}{3}$, so the person's
pace is $\frac{22}{3}$ minutes per mile.

$\frac{3}{4} \div \frac{11}{2} = \frac{3}{22}$, so the person's
speed is $\frac{3}{22}$ miles per minute.