Dear Teachers,

During the listening tour, the Eureka Math Team enjoyed the opportunity to witness our curriculum being implemented in St. Charles classrooms. We listened carefully to the feedback you provided about additional resources that could support implementation and are excited to deliver a pilot version of a new resource, Eureka Math Homework Guides, intended to help bridge the gap between the classroom and home.

Our writers have begun creating Homework Guides to provide families with insight of the understandings and skills gained during each math lesson. The guides are designed to deliver guidance for the problems on the homework pages (K-5)/problem sets (6-12). The problems and their worked out solutions included in each Homework Guide were chosen intentionally and closely align with at least one problem on the homework/problem set.

After examining your curriculum maps, we created ten Homework Guides for each grade level, K-10, and have done our best to create these documents for immediate use. In order for these to support student learning, please make them available for families at home. Students and their families can use the Homework Guides to receive helpful hints when homework becomes challenging.

In order for you to help us continue to improve our curriculum and accompanying resources, we welcome any and all feedback you and/or your students' families can provide. After receiving feedback, our goal is to create a Homework Guide for every lesson in the curriculum and make them available to the public.

We are excited to provide you with this pilot set of Homework Guides and even more excited to improve this resource through your valued feedback.

Many Thanks,
The Eureka Math Team

G5-M4-Lesson 17: Relate decimal and fraction multiplication.

Multiply and model. Rewrite each expression as a multiplication sentence with decimal factors.

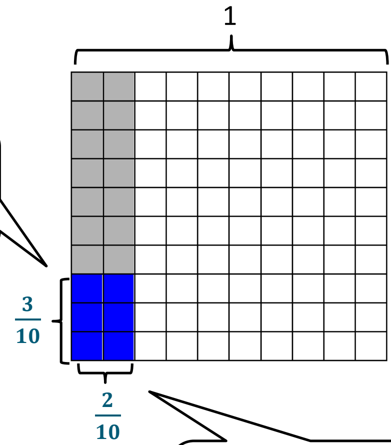
1.

$\frac{3}{10} \times \frac{2}{10}$

$= \frac{\mathbf{3 \times 2}}{\mathbf{10 \times 10}}$

$= \frac{\mathbf{6}}{\mathbf{100}}$

First, I'll shade in $\frac{2}{10}$ (20 squares vertically).



Since the whole grid represents 1, each square represents $\frac{1}{100}$. 10 squares is equal to $\frac{1}{10}$.

When multiplying fractions, I multiply the two numerators, 3 × 2, and the two denominators, 10 × 10, to get $\frac{6}{100}$.

Then I'll shade in $\frac{3}{10}$ of $\frac{2}{10}$ (6 squares).

2.

$\frac{3}{10} \times 1.2$

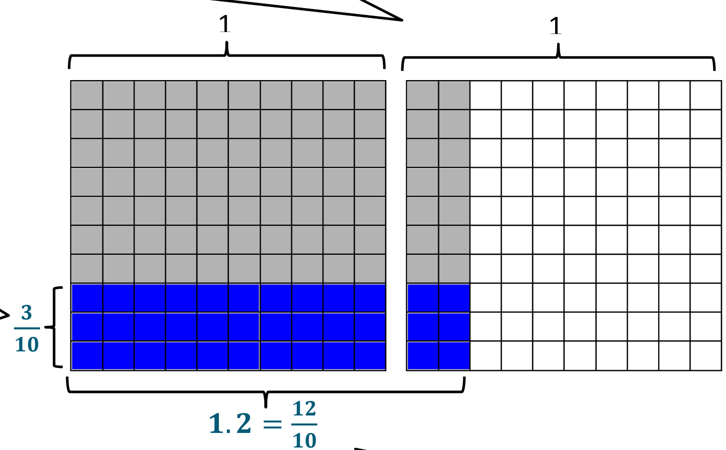
$= \frac{\mathbf{3}}{\mathbf{10}} \times \frac{\mathbf{12}}{\mathbf{10}}$

$= \frac{\mathbf{3 \times 12}}{\mathbf{10 \times 10}}$

$= \frac{\mathbf{36}}{\mathbf{100}}$

Label each whole grid as 1, each square represents $\frac{1}{100}$.

First, I'll shade in 1 and $\frac{2}{10}$ (120 squares vertically).



I'll rename 1.2 as an improper fraction of $\frac{12}{10}$, then I'll multiply across to get $\frac{36}{100}$.

Then I'll shade in $\frac{3}{10}$ of $\frac{12}{10}$ (36 squares).

I'll first rewrite the decimal as a fraction, then I'll multiply the two numerators and the two denominators to get $\frac{12}{10}$. Lastly, I'll rewrite it as a mixed number if possible.

3. Multiply.

$2 \times 0.6 = \mathbf{1.2}$

$= 2 \times \frac{6}{10}$

$= \frac{2 \times 6}{10}$

$= \frac{12}{10}$

$= 1.2$

$0.2 \times 0.6 = \mathbf{0.12}$

$= \frac{2}{10} \times \frac{6}{10}$

$= \frac{2 \times 6}{10 \times 10}$

$= \frac{12}{100}$

$= 0.12$

0.2 is 2 tenths. The fraction form is 2 out of 10, or $\frac{2}{10}$. After multiplying, the answer is $\frac{12}{100}$ or 0.12.

$0.02 \times 0.6 = \mathbf{0.012}$

$= \frac{2}{100} \times \frac{6}{10}$

$= \frac{2 \times 6}{100 \times 10}$

$= \frac{12}{1{,}000}$

$= 0.012$

0.02 is 2 hundredths. The fraction form is 2 out of 100, or $\frac{2}{100}$. After multiplying, the answer is $\frac{12}{1{,}000}$ or 0.012.

4. Sydney makes 1.2 liters of orange juice. If she pours 4 tenths of the orange juice in the glass, how many liters of orange juice are in the glass?

$\frac{4}{10}$ of 1.2 L $= \frac{4}{10} \times 1.2$

$= \frac{4}{10} \times \frac{12}{10}$

$= \frac{4 \times 12}{10 \times 10}$

$= \frac{48}{100}$

$= 0.48$

There are 0.48 L of orange juice in the glass.

To find 4 tenths of 1.2 Liters, I'll multiply $\frac{4}{10}$ times $\frac{12}{10}$ to get $\frac{48}{100}$, or 0.48. Then I write a word sentence to answer the question.

G5-M4-Lesson 18: Relate decimal and fraction multiplication.

Multiply using both fraction form and unit form.

1.

$2.3 \times 1.6 = \frac{23}{10} \times \frac{16}{10}$

$= \frac{23 \times 16}{100}$

$= \frac{368}{100}$

$= 3.68$

```
   2 3 tenths
×  1 6 tenths
  1 3 8
+ 2 3 0
  3 6 8 hundredths
```

First, I'll rewrite the decimals (2.3 and 1.6) in unit form (23 tenths and 16 tenths).

Then, I'll multiply the 2 numbers as if they are whole numbers to get 368. The product's unit is hundredths because tenths times tenths is equal to hundredths.

I'll rewrite the decimals (2.3 and 1.6) as fractions ($\frac{23}{10}$ and $\frac{16}{10}$), and then I multiply to get $\frac{368}{100}$, or 3.68.

2.

$2.38 \times 1.8 = \frac{238}{100} \times \frac{18}{10}$

$= \frac{238 \times 18}{1{,}000}$

$= \frac{4{,}284}{1{,}000}$

$= 4.284$

```
   2 3 8 hundredths
×    1 8 tenths
  1 9 0 4
+ 2 3 8 0
  4, 2 8 4 thousandths
```

First, I'll rewrite the decimals (2.38 and 1.8) in unit form (238 hundredths and 18 tenths).

I'll rewrite the decimals (2.38 and 1.8) as fractions ($\frac{238}{100}$ and $\frac{18}{10}$), and then I multiply to get $\frac{4{,}284}{1{,}000}$, or 4.284.

Then, I'll multiply the 2 numbers as if they are whole numbers to get 4,284. The product's unit is thousandths because hundredths times tenths is equal to thousandths.

3. A flower garden measures 2.75 meters by 4.2 meters.

a. Find the area of the flower garden.

2.75 m × 4.2 m = 11.55 m^2

The area of the flower garden is 11.55 square meters.

```
       2 7 5 hundredths
×        4 2 tenths
       5 5 0
+  1 1 0 0 0
   1 1,5 5 0 thousandths
```

I'll multiply the 2 sides, length times width, to get the area of 11.55 m^2 and then I write a word sentence to answer the question.

Remember: Hundredths times tenths is equal to thousandths, $\frac{1}{100} \times \frac{1}{10} = \frac{1}{1{,}000}$. So, 275 hundredths times 42 tenths is equal to 11,550 thousandths, which is 11.55.

b. The area of the vegetable garden is one and a half times that of the flower garden. Find the total area of the flower garden and the vegetable garden.

11.55 × 1.5 = 17.325

```
     1 1 5 5 hundredths
×        1 5 tenths
     5 7 7 5
+  1 1 5 5 0
   1 7,3 2 5 thousandths
```

11.55 + 17.325 = 28.875

```
    1 1. 5 5 0
+   1 7. 3 2 5
    2 8. 8 7 5
```

This is a two-step word problem. First, I'll find the area of the vegetable garden by multiplying the area of the flower garden times 1.5 to get 17.325 m^2.

The second step is to add the area of the two gardens together to get a total of 28.875 m^2.

The total area of the flower garden and the vegetable garden is 28.875 m2.

G5-M4-Lesson 19: Convert measures involving whole numbers, and solve multi-step word problems.

Convert. Express your answer as a mixed number, if possible.

1. 9 in = ______ ft

9 in = 9 × 1 in

$= 9 \times \frac{1}{12}$ **ft**

$= \frac{9}{12}$ **ft**

$= \frac{3}{4}$ **ft**

> Remember:
>
> 1 foot = 12 inches. Thus, 1 inch = $\frac{1}{12}$ foot.

> Since 9 inches is the same as 9 times 1 inch, I'll rename 1 inch as $\frac{1}{12}$ foot and then multiply. The answer is $\frac{9}{12}$ or $\frac{3}{4}$ foot.

2. 20 oz = ______ lb

20 oz = 20 × 1 oz

$= 20 \times \frac{1}{16}$ **lb**

$= \frac{20}{16}$ **lb**

$= 1\frac{4}{16}$ **lb**

$= 1\frac{1}{4}$ **lb**

> Remember:
>
> 1 pound = 16 ounces. Thus, 1 ounce = $\frac{1}{16}$ pound.

> Since 20 ounces is the same as 20 times 1 ounce, I'll rename 1 ounce as $\frac{1}{16}$ pound and then multiply. The answer is $1\frac{4}{16}$ or $1\frac{1}{4}$ pounds.

3. Jack buys 14 ounces of peanuts.

   a. What fraction of a pound of peanuts did Jack buy?

14 oz = ______ lb

14 oz = 14 × 1 oz

$= 14 \times \frac{1}{16}$ lb

$= \frac{14}{16}$ lb

$= \frac{7}{8}$ lb

Jack bought $\frac{7}{8}$ pounds of peanuts.

1 pound = 16 ounces. Thus, 1 ounce = $\frac{1}{16}$ pound. I multiply 14 times $\frac{1}{16}$, the answer is $\frac{14}{16}$ or $\frac{7}{8}$ pounds.

   b. If a whole pound of peanut costs $8, how much did Jack pay?

$\frac{7}{8}$ of \$8 = $\frac{7}{8} \times 8$

$= \frac{7 \times 8}{8}$

$= \frac{56}{8}$

$= 7$

Jack paid $7.

One eighth of $8 is $1.
Seven eighths of $8 is $7.

G5-M4-Lesson 20: Convert mixed unit measurements, and solve multi-step word problems.

Convert. Express the answer as a mixed number.

1. $2\frac{2}{3}$ ft = _______ in

$2\frac{2}{3}$ ft = $2\frac{2}{3} \times 1$ ft

= $2\frac{2}{3} \times 12$ in

= $\frac{8}{3} \times 12$ in

= $\frac{96}{3}$ in

= 32 in

Remember:
1 foot = 12 inches.

First, I'll rename the mixed number, $2\frac{2}{3}$, as a fraction greater than 1, or an improper fraction, $\frac{8}{3}$. Then, I'll multiply by 12 inches. The answer is 32 inches.

2. $2\frac{7}{10}$ hr = _______ min

$2\frac{7}{10}$ hr = $2\frac{7}{10} \times 1$ hr

= $2\frac{7}{10} \times 60$ min

= (2 × 60 min) + ($\frac{7}{10}$ × 60 min)

= (120 min) + (42 min)

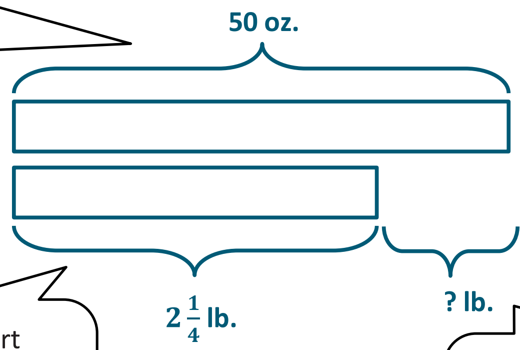
= 162 min

Remember:
1 hour = 60 minutes.

I can also use the distributive property. I multiply 2 × 60 minutes and add that to the product of $\frac{7}{10}$ × 60 minutes.

3. Charlie buys $2\frac{1}{4}$ pounds of apples for a pie. He needs 50 ounces of apples for the pie. How many more pounds of apples does he need to buy?

First, I'll draw a whole tape diagram showing the total of 50 ounces of apples that Charlie needs for the pie.



Next, I'll draw a part and label $2\frac{1}{4}$ pounds representing the apples Charlie bought.

Lastly, I'll label the remaining part that Charlie needs with a question mark, to represent what I'm trying to find out.

$2\frac{1}{4}$ lb = ______ oz

$2\frac{1}{4}$ lb $= 2\frac{1}{4} \times 1$ lb

$= 2\frac{1}{4} \times 16$ oz

$= \frac{9}{\not{4}_1} \times \not{16}^{4}$ oz

$= 36$ oz

$$\begin{array}{r} 50 \text{ oz} \\ -\ 36 \text{ oz} \\ \hline 14 \text{ oz} \end{array}$$

14 oz = ______ lb

14 oz $= 14 \times 1$ oz

$= 14 \times \frac{1}{16}$ lb

$= \frac{14}{16}$ lb

$= \frac{7}{8}$ lb

First, I'll convert $2\frac{1}{4}$ pounds to ounces by multiplying by 16. $2\frac{1}{4}$ pounds is equal to 36 ounces.

Then, I'll subtract 36 ounces from the total of 50 ounces to find how many more ounces of apples Charlie needs to buy. The difference is 14 ounces.

Lastly, since the question asked how many more pounds does he need to buy, I'll convert 14 ounces to pounds. After simplifying, the answer is $\frac{7}{8}$ pounds.

Charlie needs to buy $\frac{7}{8}$ pounds of apples.

Write a sentence to answer the question.

G5-M4-Lesson 21: Explain the size of the product, and relate fraction and decimal equivalence to multiplying a fraction by 1.

Fill in the blanks.

1.

$\frac{3}{5} \times 1 = \frac{3}{5} \times \frac{6}{6} = \frac{18}{30}$

Remember: Any number times 1, or a fraction equal to 1, will be equal to the number itself.

I can also use division to think about what fraction will work, $\frac{3}{5} \times - = \frac{18}{30}$. The numerator, 18 ÷ 3 = 6, and denominator, 30 ÷ 5 = 6. The fraction $\frac{6}{6}$ makes sense because $\frac{6}{6}$ = 1. So, $\frac{3}{5} \times \frac{6}{6} = \frac{18}{30}$, and $\frac{3}{5} = \frac{18}{30}$.

Remember: In order to write a fraction as a decimal, the denominator must be a power of 10, (*e.g.*, 10, 100, or 1,000.) $\frac{1}{10} = 0.1$, $\frac{1}{100} = 0.01$, $\frac{1}{1{,}000} = 0.001$.

2. Express each fraction as an equivalent decimal.

a. $\frac{1}{4} \times \frac{25}{25} = \frac{25}{100} = 0.25$

I look at the denominator, 4, and it is a factor of 100 and 1,000.

I'll pick 100 to be the denominator. So I'll multiply $\frac{1}{4} \times \frac{25}{25} = \frac{25}{100}$. The decimal form of $\frac{25}{100}$ is 0.25.

b. $\frac{4}{5} \times \frac{\mathbf{2}}{\mathbf{2}} = \frac{\mathbf{8}}{\mathbf{10}} = \mathbf{0.8}$

I look at the denominator, 5, and it is a factor of 10, 100, and 1,000.

I'll pick 10 to be the denominator. So I'll multiply $\frac{4}{5} \times \frac{2}{2} = \frac{8}{10}$. The decimal form of $\frac{8}{10}$ is 0.8.

Since $\frac{21}{20}$ is a fraction greater than 1, or an improper fraction, the equivalent decimal must also be greater than 1.

c. $\frac{21}{20} \times \frac{\mathbf{5}}{\mathbf{5}} = \frac{\mathbf{105}}{\mathbf{100}} = \mathbf{1.05}$

I look at the denominator, 20, and it is a factor of 100 and 1,000.

I'll pick 100 to be the denominator. So I'll multiply $\frac{21}{20} \times \frac{5}{5} = \frac{105}{100}$. The decimal form of $\frac{105}{100}$ is 1.05.

Since $3\frac{21}{50}$ is a mixed number, the equivalent decimal must also be greater than 1.

d. $3\frac{21}{50} \times \frac{2}{2} = \mathbf{3\frac{42}{100}} = \mathbf{3.42}$

I look at the denominator, 50, and it is a factor of 100 and 1,000.

I'll pick 100 to be the denominator.

So I'll multiply by $\frac{2}{2}$ to get $3\frac{42}{100}$.

$3\frac{42}{100}$ is the same as 3.42.

3. Vivian has $\frac{3}{4}$ of a dollar. She buys a lollipop for 59 cents. Change both numbers into decimals, and tell how much money Vivian has after paying for the lollipop.

$\frac{3}{4} = \frac{3}{4} \times \frac{25}{25}$

$= \frac{75}{100}$

$= 0.75$

59 cents = $0.59

$$\begin{array}{r} \$0.\ 7\ 5 \\ -\ \$0.\ 5\ 9 \\ \hline \$0.\ 1\ 6 \end{array}$$

First, I'll multiply $\frac{3}{4} \times \frac{25}{25}$ to get $\frac{75}{100}$. $\frac{75}{100}$ is the same as $0.75.

Next, I'll rewrite the decimal form of 59 cents as $0.59.

Lastly, I'll subtract $0.59 from $0.75 to find that Vivian has $0.16 left after paying for the lollipop.

Vivian has $0.16 left after paying the lollipop.

Write the word sentence to answer the question.

G5-M4-Lesson 22: Compare the size of the products to the size of the factors.

1. Solve for the unknown. Rewrite each phrase as a multiplication sentence. Circle the scaling factor and put a box around the factor naming the number of meters.

   a. $\frac{1}{2}$ as long as 8 meters = **4** meters

   $\frac{1}{2} \times 8\text{ m} = 4\text{ m}$

   Half of 8 is 4, so 1 half of 8 *meters* is 4 *meters*.

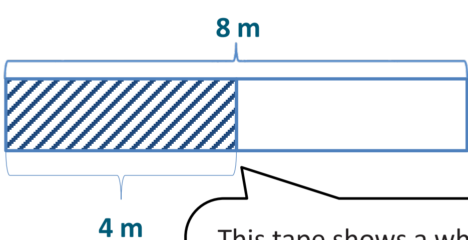
   b. 8 times as long as $\frac{1}{2}$ meter = **4** meters

   $8 \times \frac{1}{2}\text{ m} = 4\text{ m}$

   2 times 1 half is equal to 1. So 8 times 1 half (or 8 copies of 1 half) is equal to 4.

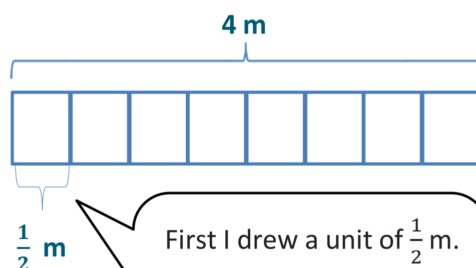
2. Draw a tape diagram to model each situation in Problem 1, and describe what happened to the number of meters when it was multiplied by the scaling factor.

   a.



   This tape shows a whole of 8 meters. I partitioned it into 2 equal units to make halves. Half of 8 m is 4 m.

   b.



   First I drew a unit of $\frac{1}{2}$ m. Then I made 8 copies of it to show $8 \times \frac{1}{2}$ m, which is equal to 4 m.

In part (a), the scaling factor, $\frac{1}{2}$, is less than 1 so the number of meters decreased.

In part (b), the scaling factor, 8, is greater than 1 so the number of meters increased.

3. Look at the inequalities in each box. Choose a single fraction to write in all three blanks that would make all three number sentences true. Explain how you know.

a.

$\frac{3}{4} \times \frac{4}{2} > \frac{3}{4}$	$2 \times \frac{4}{2} > 2$	$\frac{7}{5} \times \frac{4}{2} > \frac{7}{5}$

Multiplying by a factor greater than 1, like $\frac{4}{2}$, will make the product larger than the first factor shown. Any fraction greater than 1 will work.

Each of these inequalities show that the expression on the left is greater than the value on the right. Therefore, I need to think of a scaling factor that is greater than 1, like $\frac{4}{2}$.

b.

$\frac{3}{4} \times \frac{1}{3} < \frac{3}{4}$	$2 \times \frac{1}{3} < 2$	$\frac{7}{5} \times \frac{1}{3} < \frac{7}{5}$

Multiplying by a factor less than 1, like $\frac{1}{3}$, will make the product smaller than the first factor shown. Any fraction less than 1 will work.

Each of these inequalities show that the expression on the left is less than the value on the right. Therefore, I need to think of a scaling factor that is less than 1, like $\frac{1}{3}$.

4. A company uses a sketch to plan an advertisement on the side of a building. The lettering on the sketch is $\frac{3}{4}$ inch tall. In the actual advertisement, the letters must be 20 times as tall. How tall will the letters be on the actual advertisement?

$$20 \times \frac{3}{4} = 20 \times \frac{3}{4}$$
$$= \frac{20 \times 3}{4}$$
$$= \frac{60}{4} = 15$$

The letters on the sketch have been scaled down to fit on the page; therefore, the letters on the actual advertisement will be larger. In order to find out how large the actual letters will be, I need to multiply 20 by $\frac{3}{4}$ inch.

The letters on the actual advertisement will be 15 inches tall.

G5-M4-Lesson 23: Compare the size of the products to the size of the factors.

1. Sort the following expressions by rewriting them in the table.

[13.89] × 1.004 | [602] × 0.489 | [102.03] × 4.015

[0.3] × 0.069 | [0.72] × 1.24 | [0.2] × 0.1

Since 0.489 is less than 1, if I multiplied it by 602, the answer would be less than 602. I'll put this expression in the column on the left.

The product is the result of or answer to a multiplication expression.

The product is less than the boxed number:	The product is greater than the boxed number:
[0.3] × 0.069	[13.89] × 1.004
[602] × 0.489	[0.72] × 1.24
[0.2] × 0.1	[102.03] × 4.015

All of the expressions in this column have a boxed number that is multiplied by a **scaling factor less than 1** (e.g., 0.069, and 0.1.) Therefore, the product will be less than the boxed number.

All of the expressions in this column have a boxed number that is multiplied by a **scaling factor more than 1** (e.g., 1.004 and 4.015.) Therefore, the product will be greater than the boxed number.

2. Write a statement using one of the following phrases to compare the value of the expressions.

is slightly more than ***is a lot more than*** ***is slightly less than*** ***is a lot less than***

a. 4 × 0.988 ___is slightly less than___ 4

> In this example, the product of 4 × 0.988 is being compared to the factor 4. Since the scaling factor, 0.988, is less than 1, the product will be less than 4. However, since the scaling factor, 0.988 is just ***slightly*** less than 1, the factor will also be ***slightly*** less than 4.

b. 1.05 × 0.8 ___is slightly more than___ 0.8

c. 1,725 × 0.013 ___is a lot less than___ 1,725

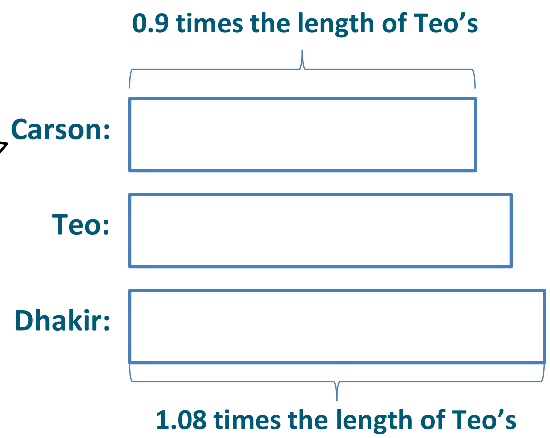
d. 89.001 × 1.3 ___is a lot more than___ 1.3

> In this example, the product of 89.001 × 1.3 is being compared to the factor 1.3. Since the scaling factor, 89.001, is more than 1, the product will be more than 1.3. However, since the scaling factor, 89.001 is ***a lot more*** than 1, the factor will also be ***a lot more*** than 1.3.

3. During science class, Teo, Carson, and Dhakir measure the length of their bean sprouts. Carson's sprout is 0.9 times the length of Teo's, and Dhakir's is 1.08 times the length of Teo's. Whose bean sprout is the longest? The shortest?

I'll draw a tape diagram to help me solve.

0.9 is less than 1, so that means Carson's sprout is shorter than Teo's.



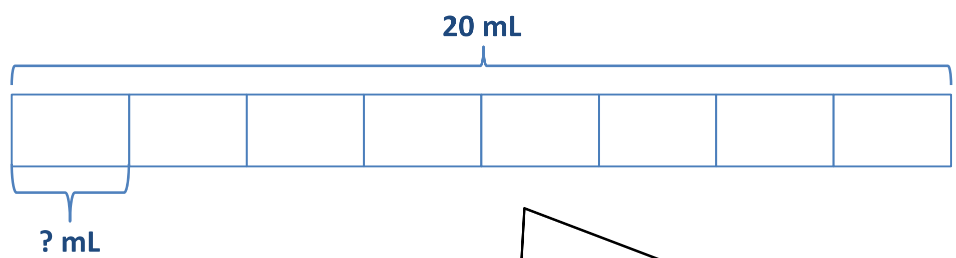
1.08 is more than 1, so that means Dhakir's sprout is longer than Teo's.

Dhakir's bean sprout is the longest.

Carson's bean sprout is the shortest.

G5-M4-Lesson 24: Solve word problems using fraction and decimal multiplication.

1. A tube contains 20 mL of medicine. If each dose is $\frac{1}{8}$ of the tube, how many mL is each dose? Express your answer as a decimal.



The whole tube is equal to 20 mL. I can find the value of one unit, or one dose, by either multiplying 20 mL $\times \frac{1}{8}$, or by dividing 20 ml by 8.

8 units = 20 mL

1 unit = 20 ÷ 8

$= \frac{20}{8}$

$= 2\frac{4}{8} = 2\frac{1}{2}$

Each dose is $2\frac{1}{2}$ mL.

Now I know that each dose is $2\frac{1}{2}$ mL, but the problem asks me to express my answer as a decimal. I'll need to find a fraction that is equal to $\frac{1}{2}$ and has a denominator of 10.

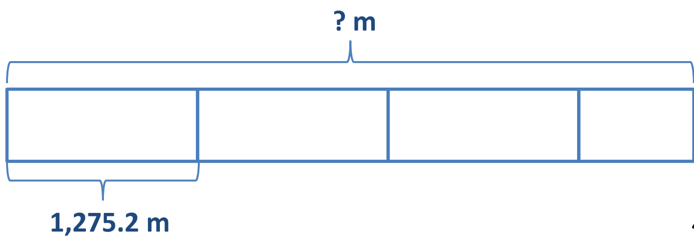
I can multiply the fraction $\frac{1}{2}$ by $\frac{5}{5}$ to create an equivalent fraction with 10 as the denominator. Then I'll be able to express $2\frac{1}{2}$ as a decimal.

$2\frac{1}{2} \times \frac{5}{5} = 2\frac{5}{10} = 2.5$

Each dose is 2.5 mL.

Note: Some students may recognize that the fraction $\frac{1}{2}$ is equal to 0.5 without showing any work. Encourage your child to show the amount of work that is necessary for them to be successful. If they can do basic calculations mentally, allow them to do so!

2. A clothing factory uses 1,275.2 meters of cloth a week to make shirts. How much cloth is needed to make $3\frac{3}{5}$ times as many shirts?



My tape diagram reminds me that I can use the distributive property to solve. I can multiply $1{,}275\frac{2}{10}$ by 3 first, then add that to the product of $1{,}275\frac{2}{10} \times \frac{3}{5}$.

$1{,}275.2$ m $= 1{,}275\frac{2}{10}$ m

I can rename 2 tenths meter as a fraction.

$$1{,}275\frac{2}{10}\text{ m} \times 3\frac{3}{5} = \left(1{,}275\frac{2}{10} \times 3\right) + \left(1{,}275\frac{2}{10} \times \frac{3}{5}\right)$$
$$= \left(3{,}825\frac{6}{10}\right) + \left(\frac{12{,}752}{10} \times \frac{3}{5}\right)$$
$$= \left(3{,}825\frac{6}{10}\right) + \left(\frac{12{,}752 \times 3}{10 \times 5}\right)$$
$$= \left(3{,}825\frac{6}{10}\right) + \left(\frac{38{,}256}{50}\right)$$
$$= \left(3{,}825\frac{6}{10}\right) + \left(765\frac{6}{50}\right)$$
$$= \left(3{,}825\frac{60}{100}\right) + \left(765\frac{12}{100}\right)$$
$$= 4{,}590\frac{72}{100} = 4{,}590.72$$

In order to add, I'll need to make like units, or find common denominators. I'll rename each fraction using hundredths, so I can easily express my final answer as a decimal.

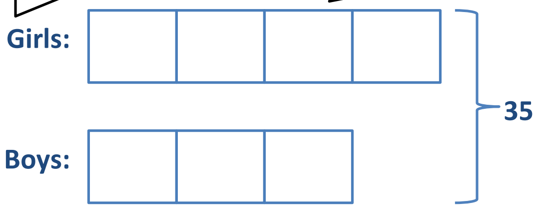
I can rename $\frac{72}{100}$ as 0.72 to express my final answer as a decimal.

4,590.72 meters of cloth are needed to make the shirts.

3. There are $\frac{3}{4}$ as many boys as girls in a class of fifth-graders. If there are 35 students in the class, how many are girls?

First I'll draw a tape to represent the girls in the class.

Then, I'll partition it into 4 equal units to make fourths.



Since there are $\frac{3}{4}$ as many boys as girls, I'll draw a tape to represent the boys, that is $\frac{3}{4}$ as long as the tape for the girls.

Now I'll think about what my tape diagram is showing. There are a total of 7 units, and those 7 units are equal to a total of 35 students. In order to find out how many girls there are, I need to know the value of 1 unit.

7 units = 35

1 unit = 35 ÷ 7

1 unit = 5

If each unit is equal to 5 students and there are 4 units representing the girls, I can multiply to find the number of girls in the class.

4 units = 4 × 5 = 20

There are 20 girls in the class.

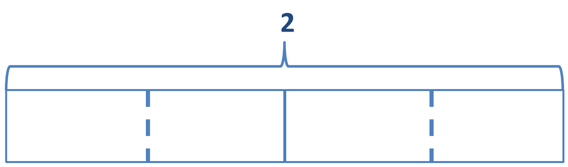
G5-M4-Lesson 25: Divide a whole number by a unit fraction.

A unit fraction is any fraction with a numerator of 1 (*e.g.*, $\frac{1}{2}$, $\frac{1}{9}$, 1 twelfth.)

1. Draw a tape diagram and a number line to solve.

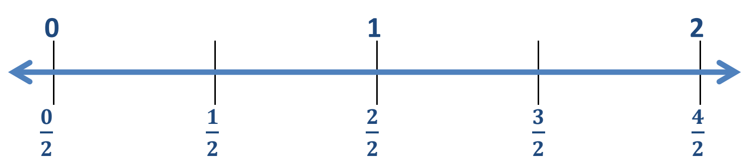
$2 \div \frac{1}{2}$

I can think about this division expression in two ways. First, I'll model it by thinking, "How many halves are in 2 wholes?"



I know that there are 2 halves in 1 whole.

Therefore, there are 4 halves in 2 wholes.



My number line shows the same thing. Since there are 2 halves in 1, there are 4 halves in 2.

$2 \div \frac{1}{2} = 4$

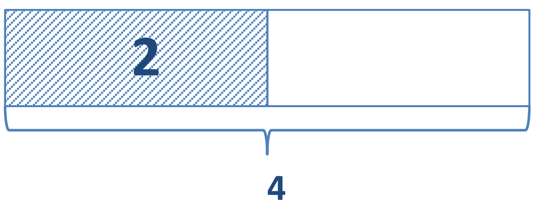
$2 \div \frac{1}{2}$

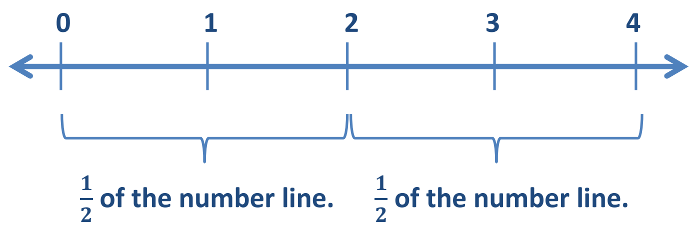
I can think about this division expression in two ways. This time, I'll model it by thinking, "2 is ***half*** of what?" or "If 2 is ***half***, what is the whole?"

First, I'll draw a unit of 2.

And since 2 is half, I'll draw another unit of 2.

My number line shows the same thing. If 2 is half, 4 is the whole.





Therefore, if 2 is half, 4 is the whole!

2. Divide. Then multiply to check.

a. $2 \div \frac{1}{3}$

Again, I can think about this expression in two ways. I can think, "How many thirds are in 2?".

Or, I might ask, "If 2 is a third, what is the whole?".

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

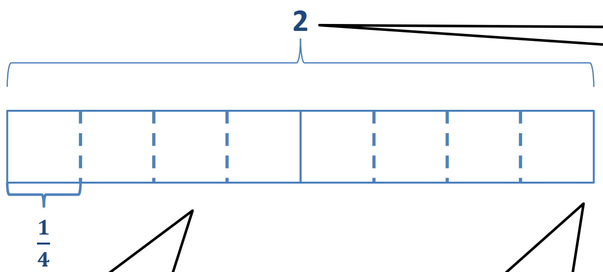
Check: $6 \times \frac{1}{3} = \frac{6 \times 1}{3} = \frac{6}{3} = 2$

There are 3 thirds in 1 whole, so there are 6 thirds in 2 wholes. Also, if 2 is a third, then 6 is the whole. Either way I think about it, the answer is 6.

3. A recipe for rolls calls for $\frac{1}{4}$ cup of sugar. How many batches of rolls can be made with 2 cups of sugar?

This problem is asking me to find how many fourths are in 2.

There is a total of 2 cups of sugar.



I partitioned each individual cup of sugar into 4 equal units, called fourths.

Since there are 4 fourths in 1 cup, there are 8 fourths in 2 cups.

$$2 \div \frac{1}{4} = 8$$

8 batches of rolls can be made with 2 cups of sugar.

G5-M4-Lesson 26: Divide a unit fraction by a whole number.

1. Solve and support your answer with a model or tape diagram. Write your quotient in the blank.

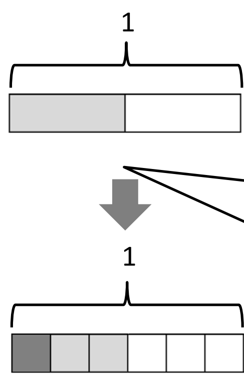
Division vocabulary: Dividend ÷ divisor = quotient.

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

1 half ÷ 3

= 3 sixths ÷ 3

= 1 sixth



The dividend is $\frac{1}{2}$. I'll draw a tape diagram by partitioning it into 2 equal units and shade $\frac{1}{2}$ or 1 out of a total of 2 units.

Since $\frac{1}{2} = \frac{3}{6}$, I'll rewrite the division sentence as 3 sixths ÷ 3. The quotient is 1 sixth, or $\frac{1}{6}$.

The divisor is 3 so I'll partition the half into 3 equal units and shade 1 of them. Now my model shows 6 equal units, called sixths, and 1 of them is shaded. 1 half divided by 3 is equal to 1 sixth.

2. Divide. Then, multiply to check.

   a. $\frac{1}{4} \div 5$

   $\frac{5}{20} \div 5$ = 5 twentieths ÷ 5 = 1 twentieth = $\frac{1}{20}$

   Check: $\frac{1}{20} \times 5 = \frac{5}{20} = \frac{1}{4}$

I can visualize a tape diagram. In my mind, I can see 1 fourth being partitioned into 5 equal units. Now, instead of seeing fourths, the tape is showing twentieths.

First, I'll rewrite $\frac{1}{4}$ as $\frac{5}{20}$. Then, writing $\frac{5}{20}$ in unit form (5 twentieths) makes the division easier for me. I know that 5 ÷ 5 is equal to 1. Therefore, 5 *twentieths* ÷ 5 = 1 *twentieth*, or $\frac{1}{20}$.

I'll check my answer by multiplying the quotient, $\frac{1}{20}$, and the divisor, 5, to get $\frac{1}{4}$. Since $\frac{1}{4}$ matched the dividend in the original expression, I know I've solved correctly.

Since Jim read $\frac{4}{5}$ of the book, it means he has $\frac{1}{5}$ left to read. $1 - \frac{4}{5} = \frac{1}{5}$.

3. Tim has read $\frac{4}{5}$ of his book. He finishes the book by reading the same amount each night for 3 nights.

   a. What fraction of the book does he read each of the 3 nights?

I'll use $\frac{1}{5}$ divided by 3 to find the fraction of book he reads each night. First, I'll rename $\frac{1}{5} = \frac{3}{15}$. Then, I'll divide 3 fifteenths ÷ 3 = 1 fifteenth, or $\frac{1}{15}$.

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

He reads $\frac{1}{15}$ of the book each night.

   b. If he reads 6 pages on each of the 3 nights, how long is the book?

1 unit = 6 pages

15 units = 15 × 6 = 90 pages

Tim reads $\frac{1}{15}$, or 6 pages, each night. So $\frac{1}{15}$ or 1 unit is equal to 6 pages.

The book has 90 pages.

The whole book is equal to $\frac{15}{15}$, or 15 units. So I'll multiply 15 times 6. The answer is 90 pages.