

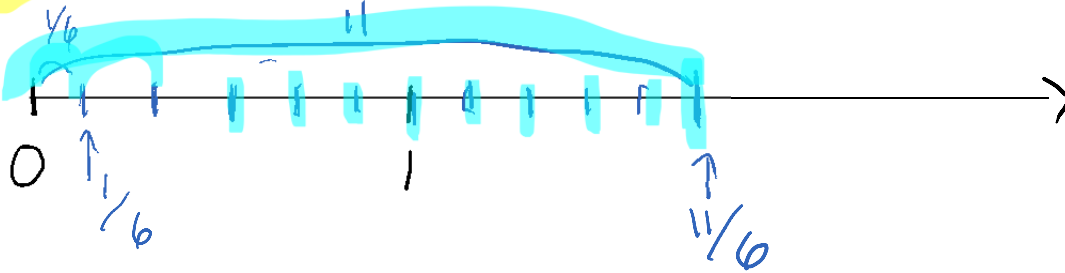
Fraction practice and review

Must-know problems that require explanations and representations:

1. Explaining your representation of a fraction (problem from test 1 practice): **Show and explain** how to draw $\frac{11}{6}$ on a number line (using size and number of unit fractions concepts)

• I draw a number line, and show where 0 and 1 is on the number line.

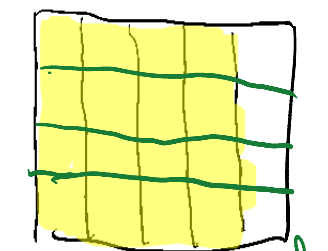
• I split the distance from 0 to 1 (1 whole) into 6 equal parts to show $1/6$.



Count up 11 steps of size $1/6$. I draw more $1/6$'s until I have 11 of them.

Make all of the $1/6$'s the same size as each other. The point at the end is $11/6$, and the distance from 0 to that point is $11/6$.

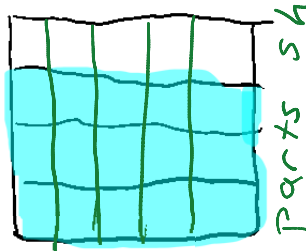
2. Explaining with a diagram what a common denominator is, and how to find equivalent fractions with a common denominator (problem from test 1 practice, edited slightly): **Show and explain** how to use a diagram to find equivalent fractions with a common denominator for $4/5$ and $3/4$. **Show and explain** how to use the diagram to figure out the number multiplications that find the equivalent fractions with a common denominator.



parts shaded

$$\begin{array}{r} 4 \times 4 = 16 \\ \hline 5 \times 4 = 20 \end{array}$$

parts in whole



parts shaded

$$\begin{array}{r} 3 \times 5 = 15 \\ \hline 4 \times 5 = 20 \end{array}$$

parts in whole

Make a rectangular diagram showing $4/5$ with vertical lines and a rectangular diagram showing $3/4$ with horizontal lines.

Split each $1/5$ into 4 parts using horizontal lines, and split each $1/4$ into 5 parts using vertical lines.

Both squares are split by the same lines, so they have the same size pieces and the same denominator.

Multiply the number of parts across by the number of parts down to get total number of parts in the whole and in the shaded part.

Each fifth in the whole becomes 4 parts, so there are 5×4 parts in the whole, and each fifth in the shaded part becomes 4 parts, so there are 4×4 shaded parts. (similarly for $3/4$)

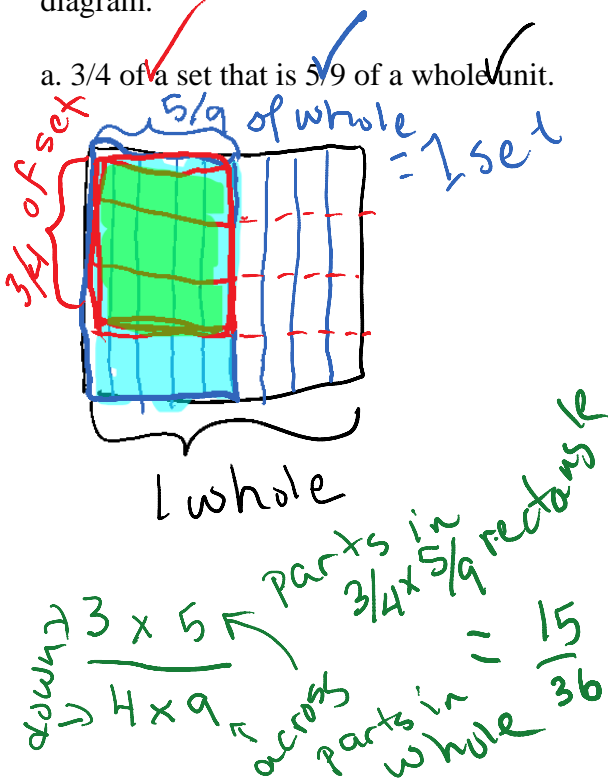
explain the reason

3. Multiplying proper fractions (problem from test 1 practice, edited slightly): a. **Explain** what $\frac{3}{4} \times \frac{5}{9}$ means.

b. **Show** and **explain** how to make a diagram to represent $\frac{3}{4} \times \frac{5}{9}$ using the representation you explained in part a.

c. **Show** and **explain** how to get the usual numerical multiplication of fractions with numbers using your diagram.

a. $\frac{3}{4}$ of a set that is $\frac{5}{9}$ of a whole unit.

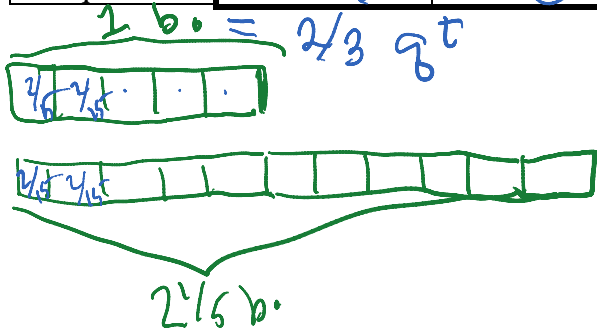


- 1. Make a square to show 1 whole unit.
 - 2. Split the square into 9 equal parts with vertical lines, and shade in 5 of the parts to show $\frac{5}{9}$ of a whole unit.
 - 3. Split the $\frac{5}{9}$ rectangle into 4 equal parts using horizontal lines, and double-shade in 3 parts in each shaded ninth. This double-shaded rectangle shows $\frac{3}{4}$ of $\frac{5}{9}$ of a whole.
 - 4. Extend the horizontal lines across the whole square so all the parts in the whole are the same size.
 - 5. The number of parts in a whole unit is 4×9 because there are 4 rows down and 9 across in the whole. The number of parts in the $\frac{3}{4} \times \frac{5}{9}$ rectangle is 3×5 because there are 3 rows down and 5 rows across.
- So the product is $\frac{3 \times 5}{4 \times 9} = \frac{15}{36}$

4. Know how to model a problem involving two kinds of units (multiplication or division)
 Make a diagram that shows the relationships in each of these word problems, and use the diagram to solve the problem. (specific problems from the March 10 practice problems):

a. a. A **bottle** has $\frac{2}{3}$ of a **quart** of juice in it. How much juice is in $2\frac{1}{5}$ bottles?

	whole bottle	all bottles
bottles	1	$2\frac{1}{5}$
quarts	$\frac{2}{3}$	x

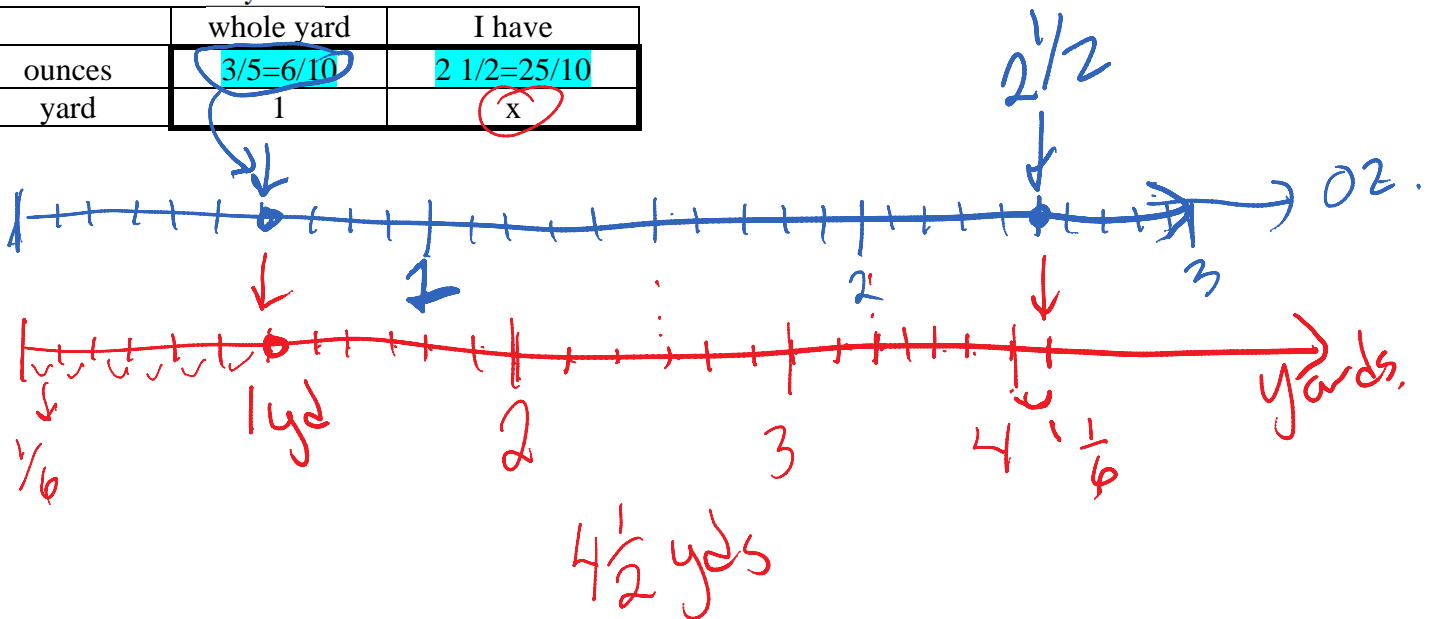


$$\frac{2}{3} \cdot 5 = \frac{2}{3} \times \frac{1}{5} = \frac{2}{15} \text{ qt}$$

$$11 \times \frac{2}{15} = \frac{22}{15} \text{ qt}$$

b. It takes $\frac{3}{5}$ **ounce** of dye to dye 1 yard of fabric. I have $2\frac{1}{2}$ ounces of dye. How many **yards** of fabric can I dye?

	whole yard	I have
ounces	$\frac{3}{5} = \frac{6}{10}$	$2\frac{1}{2} = \frac{25}{10}$
yard	1	x



c. I have $2\frac{1}{4}$ pounds of apples. That's enough to make $1\frac{3}{5}$ jars of applesauce. How many apples do I need for 1 jar of applesauce?

	I have	whole jar
pounds	$2\frac{1}{4}$	x
jars	$1\frac{3}{5} = \frac{8}{5}$	$1 = \frac{5}{5}$

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

$$= \frac{9}{4} \times \frac{1}{8} = \frac{9}{32}$$

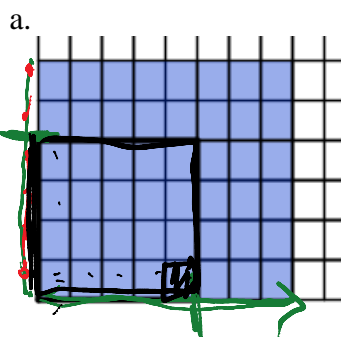


$$1\frac{3}{5} \text{ jars} = 2\frac{1}{4} \text{ lbs}$$

$$5 \times \frac{9}{32} = \frac{45}{32}$$

$$= 1\frac{13}{32}$$

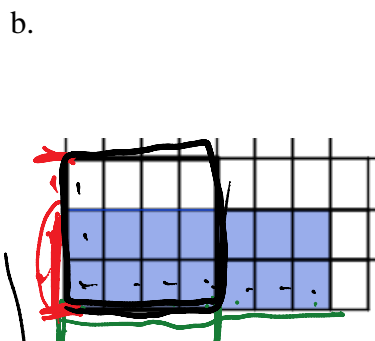
5. Identify a fraction multiplication problem from a rectangular diagram. In each of these rectangular diagrams, the whole is shown by a bold box, and the product is shown by a shaded rectangle. Write the multiplication sentence and the product (area of the shaded rectangle as a fraction of the area of the bold box).



$$\frac{4}{5} \times \frac{6}{4}$$

$$= \frac{4 \times 6}{4 \times 5}$$

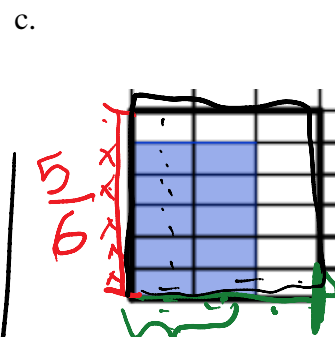
$$= \frac{48}{20} = \frac{12}{5}$$



$$\frac{2}{4} \times \frac{2}{3}$$

$$= \frac{2 \times 2}{3 \times 4} = \frac{4}{12}$$

$$= \frac{1}{3}$$



$$\frac{2}{3} \times \frac{5}{6}$$

$$= \frac{2 \times 5}{3 \times 6} = \frac{10}{18} = \frac{5}{9}$$