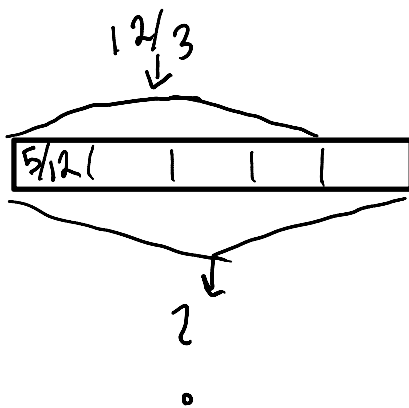


The procedure we're following for these problems is to:

- organize the information and put it in a table, organized by units
- look at the table by units, and make a bar or a number line for the unit that you know two numbers for. If one of the two known numbers is 1, use a bar diagram. If neither of the known numbers is 1, find a common denominator and use number lines.
- add the information for the other unit into the diagram, and solve either with a second number line or by multiplying by appropriate unit fractions and whole numbers.

1. A can holds  $1\frac{2}{3}$  cups of tomato sauce. How much tomato sauce is in  $1\frac{1}{4}$  cans?

1 can = $1\frac{2}{3}$ cups	$1\frac{2}{3}$ cups	? cups
? cups = $1\frac{1}{4}$ cans	1 can	$1\frac{1}{4}$ cans



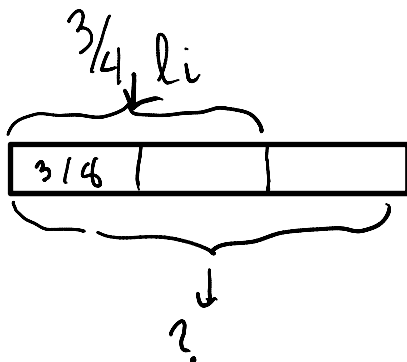
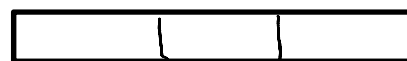
To find  $\square$

$$1\frac{2}{3} \div 4 = \frac{5}{3} \times \frac{1}{4} = \frac{5}{12} \text{ c.}$$

$$\text{To find ? : } \frac{5}{12} \times 5 = \frac{25}{12} = 2\frac{1}{12} \text{ c.}$$

2. I have  $\frac{3}{4}$  liters of soda. That's  $\frac{2}{3}$  of a serving. How much soda is in one serving?

have $\frac{3}{4}$ l.	$\frac{3}{4}$ l.	? l.
$\frac{3}{4}$ l. = $\frac{2}{3}$ serv	$\frac{2}{3}$ serv	1 serv.
? l. = 1 serv		



To find  $\square$ :

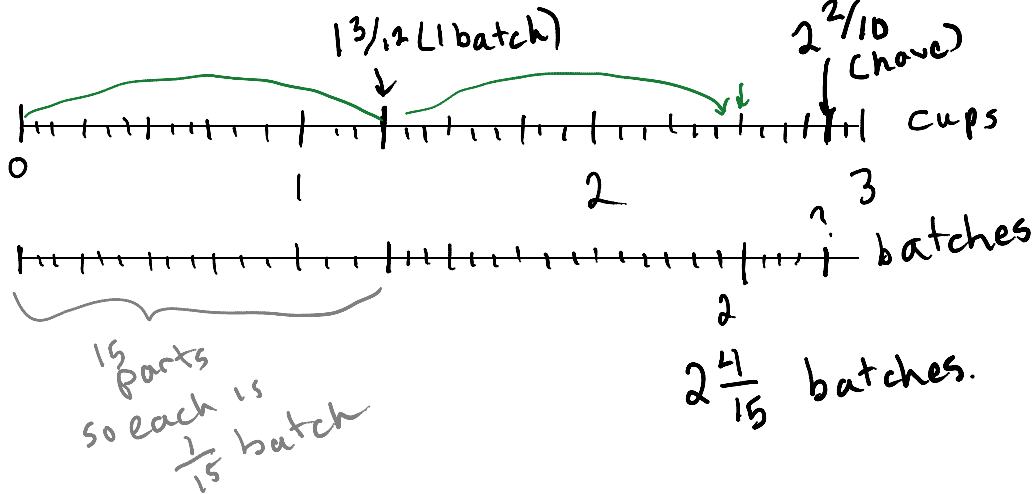
$$\frac{3}{4} \div 2 = \frac{3}{4} \times \frac{1}{2} = \frac{3}{8} \text{ l}$$

$$\text{To find ? : } \frac{3}{8} \times 3 = \frac{9}{8} \text{ l} \\ = 1\frac{1}{8} \text{ l.}$$

3. I have  $2\frac{5}{6}$  cups of pancake mix. A batch takes  $1\frac{1}{4}$  cups of mix. How many batches of pancakes can I make?

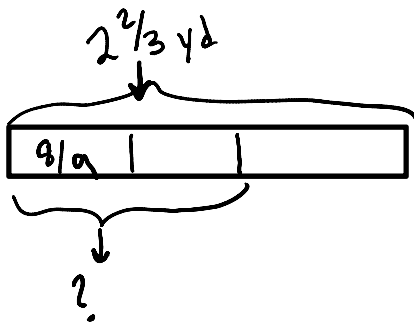
I have $2\frac{5}{6}$ cups.	$2\frac{5}{6}$ cup	$1\frac{1}{4}$ cup
1 batch = $1\frac{1}{4}$ cup	? batches	1 batch
I have = ? batches		

Because we have two different fractional amounts of cups, we need a common denominator next:  $2\frac{5}{6} = 2\frac{10}{12}$ ;  $1\frac{1}{4} = 1\frac{3}{12}$



4. I have  $2\frac{2}{3}$  yards of string. That's enough to go around the table  $1\frac{1}{2}$  times. How many yards of string do I need to go around the table once?

I have $2\frac{2}{3}$ yards.	$2\frac{2}{3}$ yd	? yd
$2\frac{2}{3}$ yards = $1\frac{1}{2}$ tables	$1\frac{1}{2}$ table	1 table
? yards = 1 table		



To find  $\square$ :

$$2\frac{2}{3} \div 3 = \frac{8}{3} \times \frac{1}{3} = \frac{8}{9} \text{ yd}$$

To find ?:

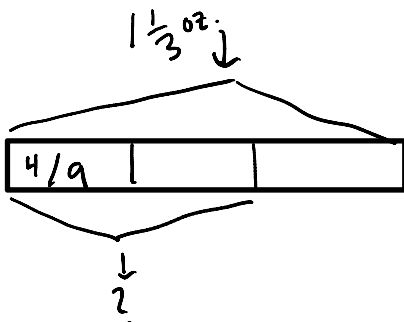
$$\frac{8}{9} \times 2 = \frac{16}{9} \text{ yd.}$$

$$= 1\frac{7}{9} \text{ yd.}$$

$1\frac{1}{2}$  times around table

5. A tube of paint holds  $1\frac{1}{3}$  ounces. How much paint is in  $\frac{2}{3}$  of a tube of paint?

1 tube = $1\frac{1}{3}$ oz	$1\frac{1}{3}$ oz	? oz
? oz = $\frac{2}{3}$ tube	1 tube	$\frac{2}{3}$ tube



To find  $\square$ :

$$1\frac{1}{3} \div 3 = \frac{4}{3} \times \frac{1}{3} = \frac{4}{9} \text{ oz.}$$

To find ?:

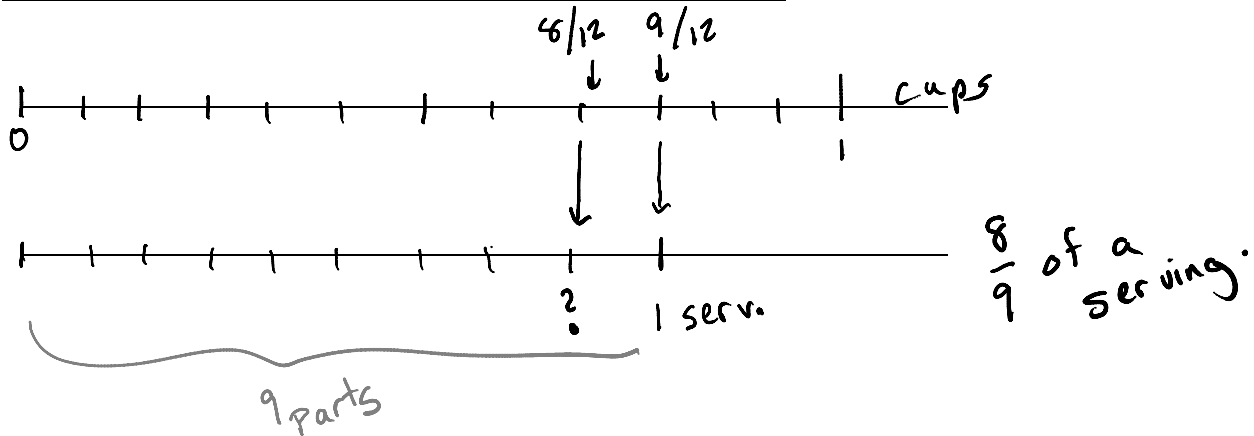
$$\frac{4}{9} \times 2 = \frac{8}{9} \text{ oz}$$

$\frac{2}{3}$  1 tube

6. I have  $\frac{2}{3}$  cups of soda. A serving is  $\frac{3}{4}$  cup. How many servings do I have?

I have = $\frac{2}{3}$ cup	$\frac{2}{3}$ cup	$\frac{3}{4}$ cup
1 serving = $\frac{3}{4}$ cup	? serv	1 serv.
I have = ? servings?		

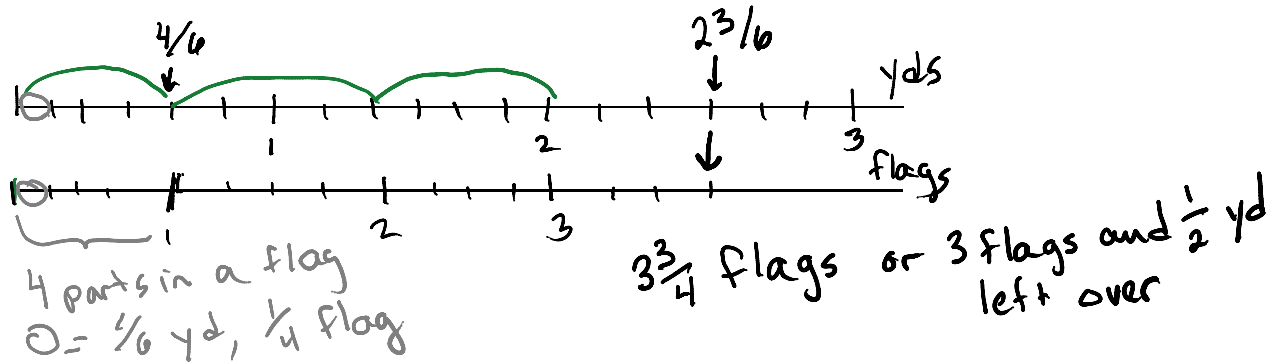
2 denominators, same unit: find common denominator:  $\frac{2}{3} = \frac{8}{12}$ ;  $\frac{3}{4} = \frac{9}{12}$



7. I have  $2\frac{1}{2}$  yards of fabric. It takes  $\frac{2}{3}$  yard of fabric to make a cub scout flag. How many flags can I make?

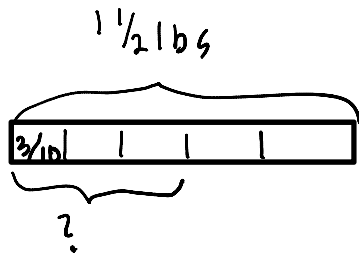
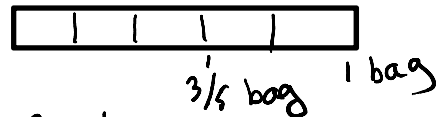
I have = $2\frac{1}{2}$ yds	$2\frac{1}{2}$ yds	$\frac{2}{3}$ yd
$\frac{2}{3}$ yd = 1 flag	? flags	1 flag
I have = ? flags		

2 denominators, same unit: find common denominator:  $\frac{2}{3} = \frac{4}{6}$ ;  $2\frac{1}{2} = 2\frac{3}{6}$



8. A bag of candy weighs  $1\frac{1}{2}$  lbs. How much does  $\frac{3}{5}$  of a bag of candy weigh?

1 bag = $1\frac{1}{2}$ lbs	$1\frac{1}{2}$ lbs	? lbs
? lbs = $\frac{3}{5}$ bag	1 bag	$\frac{3}{5}$ bag

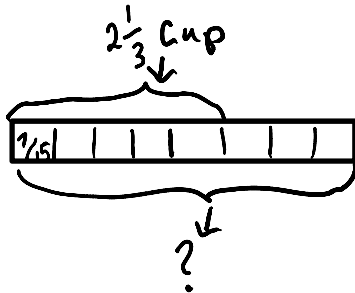
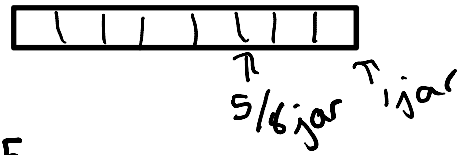


$$\square = 1\frac{1}{2} \div 5 = \frac{3}{2} \times \frac{1}{5} = \frac{3}{10} \text{ lb}$$

$$? = \frac{3}{10} \times 3 = \frac{9}{10} \text{ lb}$$

9. I have  $2 \frac{1}{3}$  cups of water. That fills the jar  $\frac{5}{8}$  of the way full. How much water would it take to fill the jar?

I have = $2 \frac{1}{3}$ cup	$2 \frac{1}{3}$ cup	? cups
$2 \frac{1}{3}$ cup = $\frac{5}{8}$ jar	$\frac{5}{8}$ jar	1 jar
? cups = 1 jar		



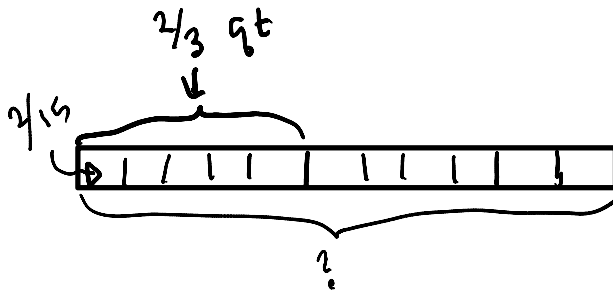
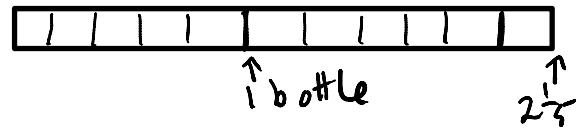
$$\square = 2 \frac{1}{3} \div \frac{5}{8}$$

$$= \frac{7}{3} \times \frac{8}{5} = \frac{56}{15}$$

$$? = \frac{56}{15} \times 8 = \frac{56}{15} = 3 \frac{11}{15} \text{ c.}$$

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

1 bottle = $\frac{2}{3}$ quart	$\frac{2}{3}$ quart	? quarts
? quart = $2 \frac{1}{5}$ bottle	1 bottle	$2 \frac{1}{5}$ bottles



$$\square = \frac{2}{3} \div \frac{5}{11} = \frac{2}{3} \times \frac{11}{5} = \frac{22}{15}$$

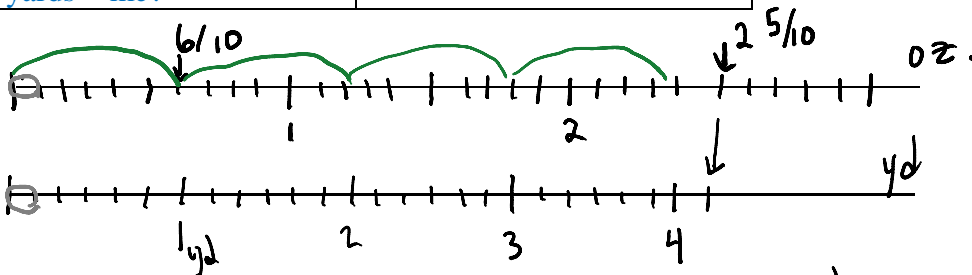
$$? = \frac{22}{15} \times 11 = \frac{22}{15} = 1 \frac{7}{15} \text{ qts}$$

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

I have = $2 \frac{1}{2}$ oz	$2 \frac{1}{2}$ oz	$\frac{3}{5}$ oz
$\frac{3}{5}$ oz = 1 yard	? yds	1 yd
? yards = me?		

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

$$\frac{3}{5} = \frac{6}{10}$$

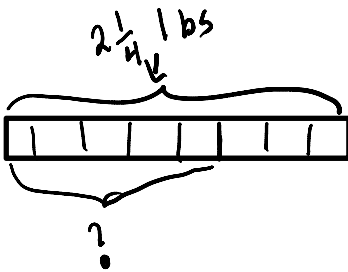
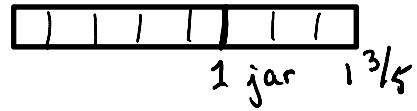


$$0 = \frac{1}{10} \text{ oz} = \frac{1}{6} \text{ yd}$$

$$4 \frac{1}{6} \text{ yds}$$

12. 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 = $2\frac{1}{4}$ lbs	$2\frac{1}{4}$ lbs	? lbs
$2\frac{1}{4}$ lbs = $1\frac{3}{5}$ jars	$1\frac{3}{5}$ jars	1 jar
? lbs = 1 jar		



$$\square = 2\frac{1}{4} \div 8 = \frac{9}{4} \times \frac{1}{8} = \frac{9}{32}$$

$$\bullet = \frac{9}{32} \times 5 = \frac{35}{32} = 1\frac{3}{32} \text{ lbs}$$

13. Alice solved the problem:

*Jan has 20 ounces of dried thyme. If a package of thyme weighs  $\frac{3}{4}$  of an ounce, how many packages of thyme can Jan make?*

by dividing:  $20 \div \frac{3}{4} = 20 \times \frac{4}{3} = \frac{80}{3} = 26\frac{2}{3}$

What does 26 tell about the answer? What does  $\frac{2}{3}$  tell about the answer?

*She can make 26 full packages, and fill another package  $\frac{2}{3}$  of the way full.*

14. John solved the problem  $\frac{5}{4} \div \frac{1}{3}$  by drawing the following diagram:



John says that this means that the answer is  $3\frac{1}{4}$ . Is he correct? If not, what is the correct answer, and how does it fit with his picture?

*If this were a word problem, then the answer could be 3 with  $\frac{1}{4}$  of a unit left over. Since this isn't a word problem, his answer isn't correct: there are 3 groups of  $\frac{1}{3}$  and  $\frac{3}{4}$  of another group (each group has 4 small parts in it), so the answer should be  $3\frac{3}{4}$ .*