

Using
Tape Diagrams
to Solve
Ratio Problems

Learning Goal:

I can solve real-world ratio problems using a tape diagram.

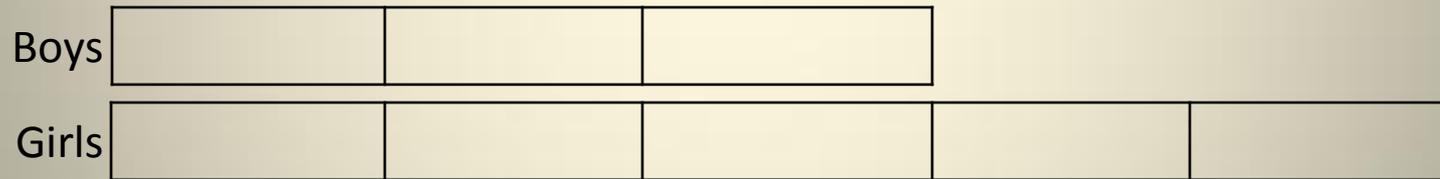
The ratio of boys to girls in the sixth grade is 3:5. If there are 20 more girls than boys, how many total students are in the sixth grade?

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If there are 20 more girls than boys, how many total students are in the sixth grade?

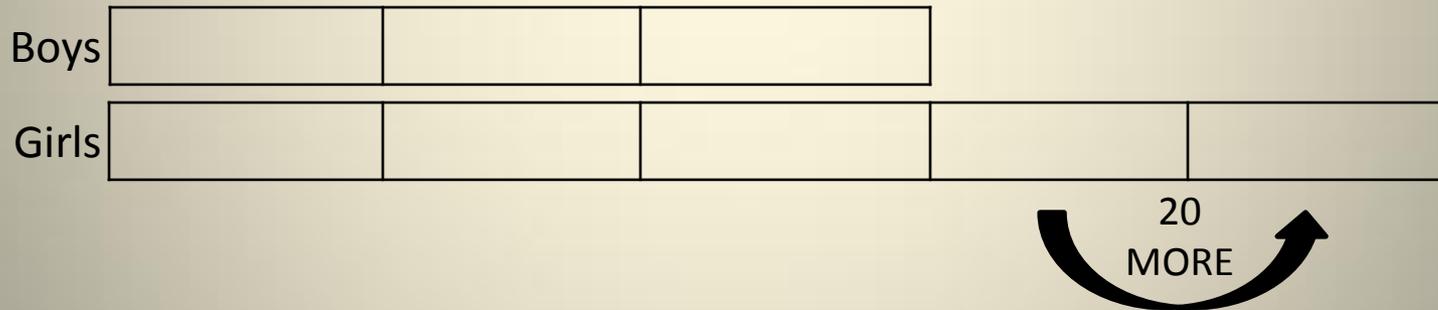
The ratio we're working with is 3:5.

Draw a tape diagram that represents that ratio.



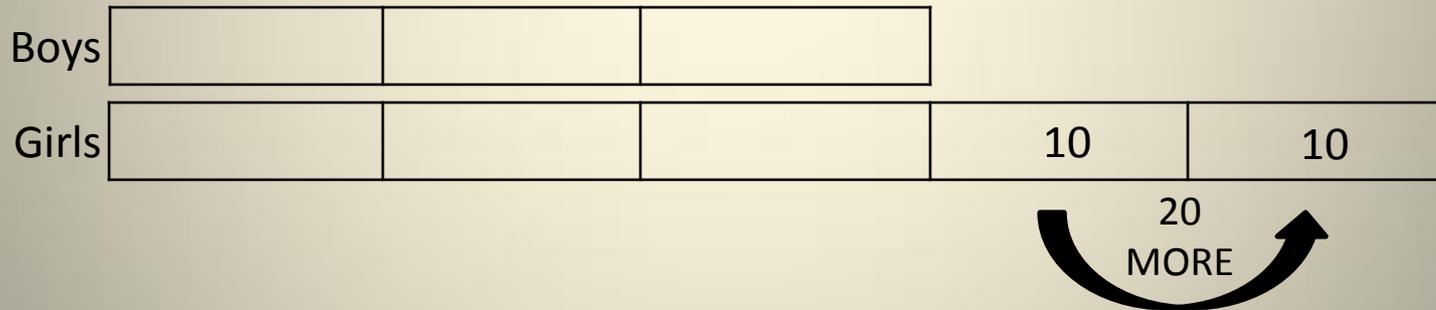
The ratio of boys to girls in the sixth grade is 3:5.
If there are 20 more girls than boys, how many
total students are in the sixth grade?

What part of our tape diagram represents
20 more girls?



The ratio of boys to girls in the sixth grade is 3:5.
If there are 20 more girls than boys, how many
total students are in the sixth grade?

“20 more girls” is represented by 2 boxes on
our tape diagram. What value should be
written in each box?



The ratio of boys to girls in the sixth grade is 3:5.
If there are 20 more girls than boys, how many total students are in the sixth grade?

Now we can find out how many total students are in sixth grade. **REMEMBER**, each box represents the same value.

What value should be written in each box?

Boys	10	10	10		
Girls	10	10	10	10	10

The ratio of boys to girls in the sixth grade is 3:5.
If there are 20 more girls than boys, **how many total students are in the sixth grade?**

Add up all the boxes to determine the total number of students.

Boys	10	10	10		
Girls	10	10	10	10	10

8 boxes of 10 =

80 students

There ratio of small dogs to large dogs at the dog show is 4:3. If there are 60 dogs in the show, how many are large dogs?

There ratio of small dogs to large dogs at the dog show is 4:3. If there are 60 dogs in the show, how many are large dogs?

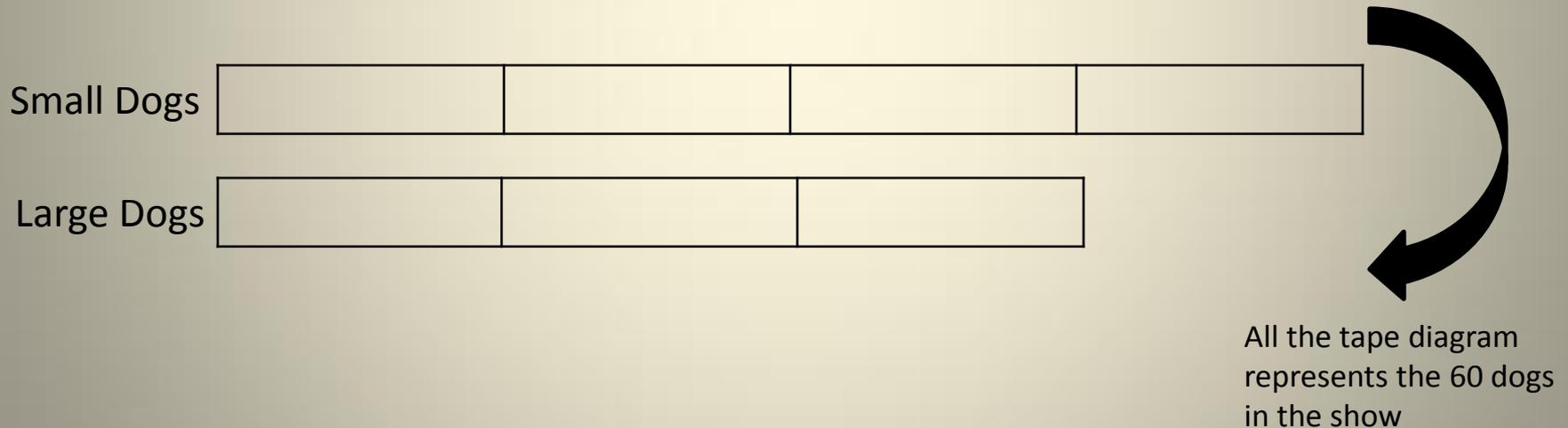
The ratio we're working with is 4:3.

Draw a tape diagram that represents that ratio.



There ratio of small dogs to large dogs at the dog show is 4:3. If there are 56 dogs in the show, how many are large dogs?

What part of the tape diagram represents all 60 dogs in the show?



There ratio of small dogs to large dogs at the dog show is 4:3. **If there are 56 dogs in the show**, how many are large dogs?

There are 7 boxes on the tape diagram. REMEMBER, each box represents the same value.

$$56 \text{ total dogs} \div 7 \text{ boxes} = 8$$

Each box on the tape diagram represents 8 dogs.



All the tape diagram represents the 56 dogs in the show

There ratio of small dogs to large dogs at the dog show is 4:3. If there are 56 dogs in the show, **how many are large dogs?**

Now we can find out how many dogs are large dogs.

$$3 \times 8 = 24$$

Small Dogs	8	8	8	8
Large Dogs	8	8	8	

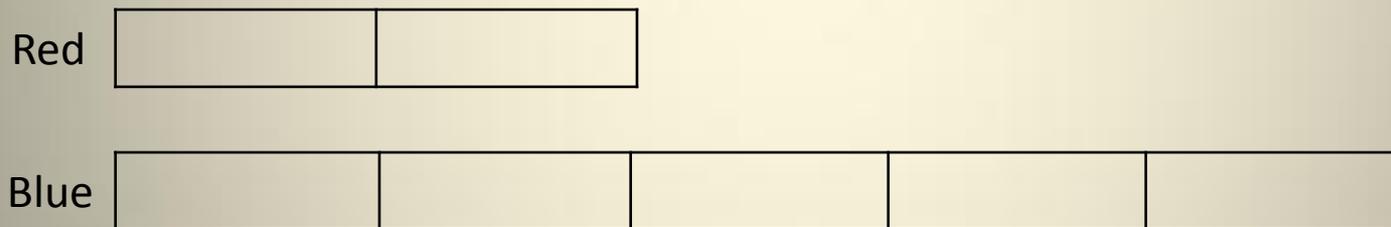
There are 24 large dogs in the dog show.

The ratio of red pens to blue pens in a package is 2:5. If there are 35 blue pens in the package, how many red pens are in the package?

The ratio of red pens to blue pens in a package is 2:5. If there are 35 blue pens in the package, how many red pens are in the package?

The ratio we're working with is 2:5.

Draw a tape diagram that represents that ratio.



The ratio of red pens to blue pens in a package is 2:5. If there are 35 blue pens in the package, how many red pens are in the package?

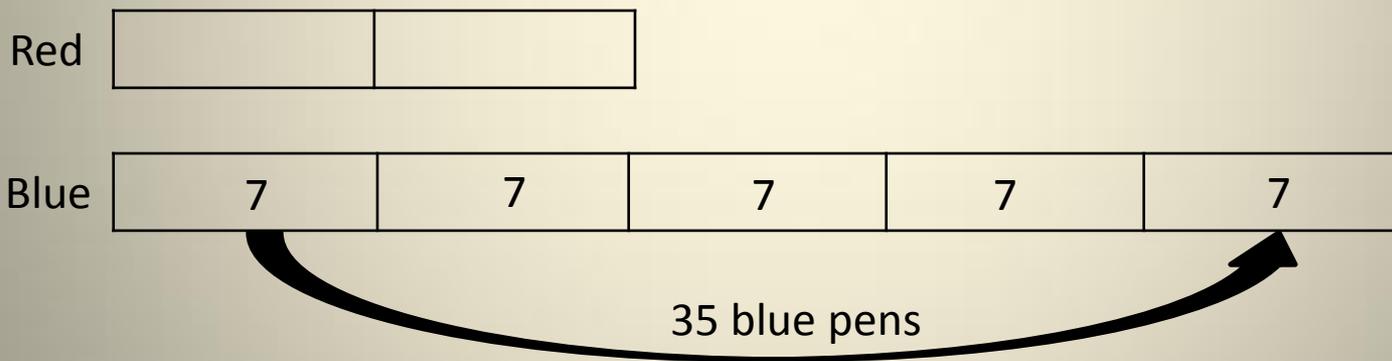
What part of our tape diagram represents the **35 blue pens**?



The ratio of red pens to blue pens in a package is 2:5. If there are 35 blue pens in the package, how many red pens are in the package?

35 blue pens is represented by 5 boxes on our tape diagram. What value should be written in each box?

$$35 \div 5 = 7$$



The ratio of red pens to blue pens in a package is 2:5. If there are 35 blue pens in the package, how many red pens are in the package?

Now we can find out how many red pens are in the package. **REMEMBER**, each box represents the same value.

What value should be written in each box?

Red	<table border="1"><tr><td>7</td><td>7</td></tr></table>	7	7	$2 \times 7 = 14$			
7	7						
Blue	<table border="1"><tr><td>7</td><td>7</td><td>7</td><td>7</td><td>7</td></tr></table>		7	7	7	7	7
7	7	7	7	7			

There are 14 red pens
in the package.

Let's try some more
problems!

The ratio of red pens to blue pens in a package is 2:5. If there are 35 blue pens in the package, how many red pens are in the package?

Step #1

Look for the ratio in the problem and make a tape diagram.

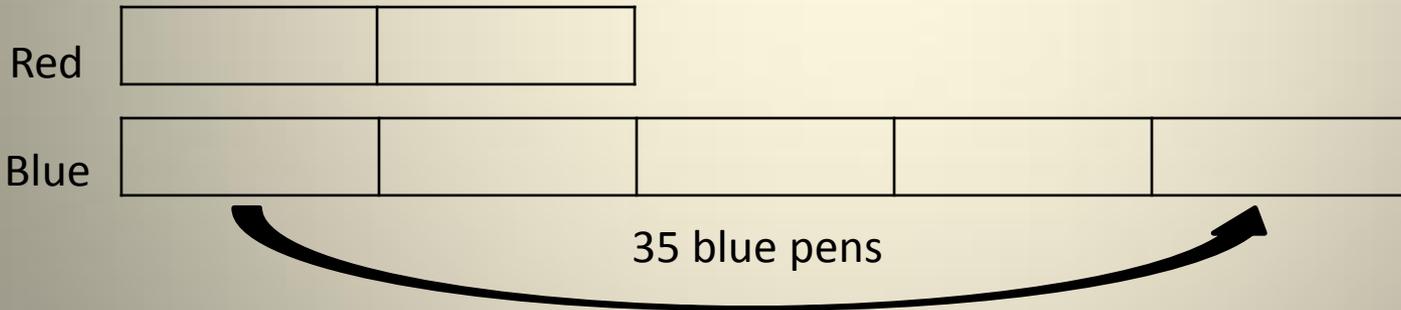
2:5



Step #2

Look in the problem for information that will help you determine the value of each box.

35 blue pens in the package

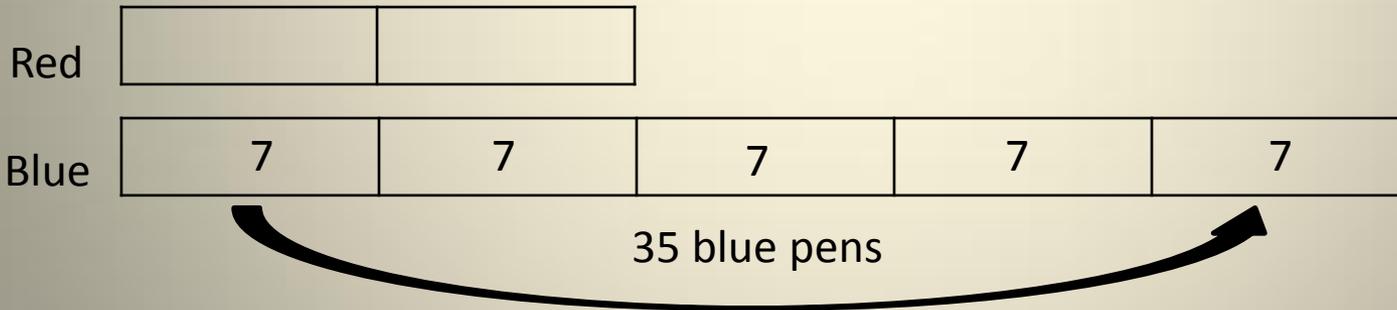


Step #3

Determine the value of each box.

Remember all boxes have an equal value.

$$35 \div 5 = 7$$



Step #4

Use the value of the boxes to answer the question in the problem.

How many red pens are in the package?

$$2 \times 7 = 14$$

Red	7	7
-----	---	---

Blue	7	7	7	7	7
------	---	---	---	---	---

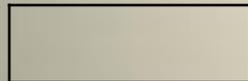
14 red pens

The ratio of red roses to pink roses in a bouquet is 4:1. If there are 12 red roses, how many pink roses are in the bouquet?

Step #1

Look for the ratio in the problem and make a tape diagram.

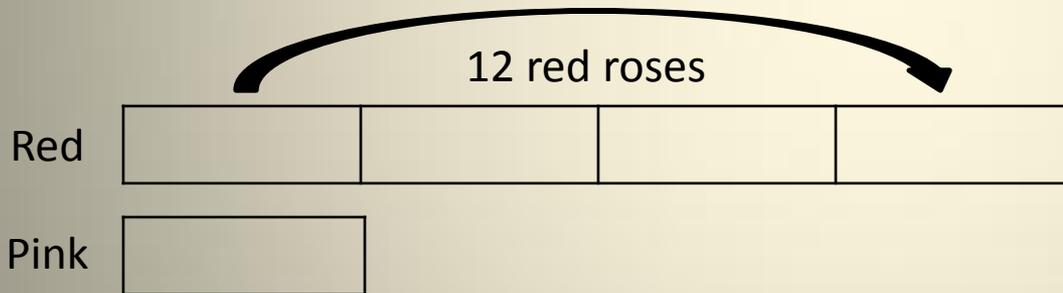
4:1



Step #2

Look in the problem for information that will help you determine the value of each box.

12 red roses



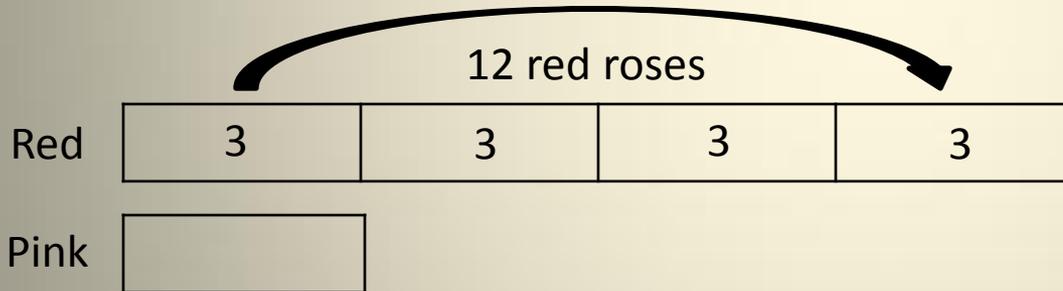
Step #3

Determine the value of each box.

Remember all boxes have an equal value.

12 red roses

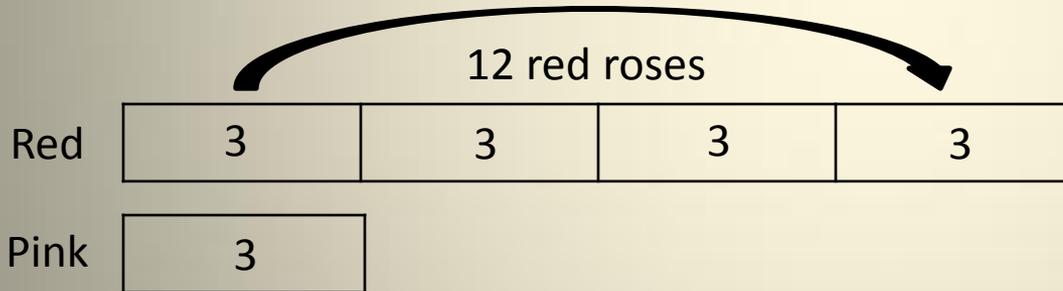
$$12 \div 4 = 3$$



Step #4

Use the value of the boxes to answer the question in the problem.

How many pink roses are in the bouquet?



There are 3 pink roses in the bouquet.

Mr. Jakers bought some apples to make applesauce.

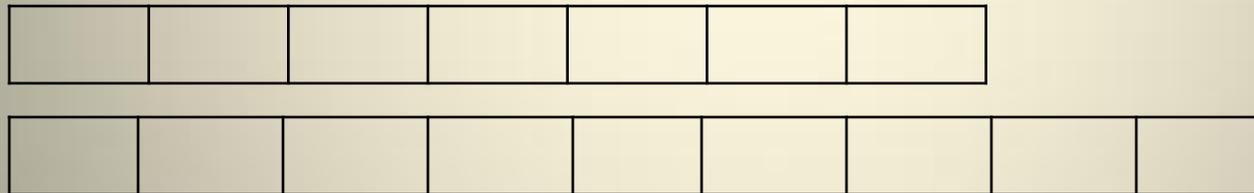
He bought red apples and green apples in a ratio of 7:9.

If he bought 8 more green apples, than red apples, how many total apples did he buy?

Step #1

Look for the ratio in the problem and make a tape diagram.

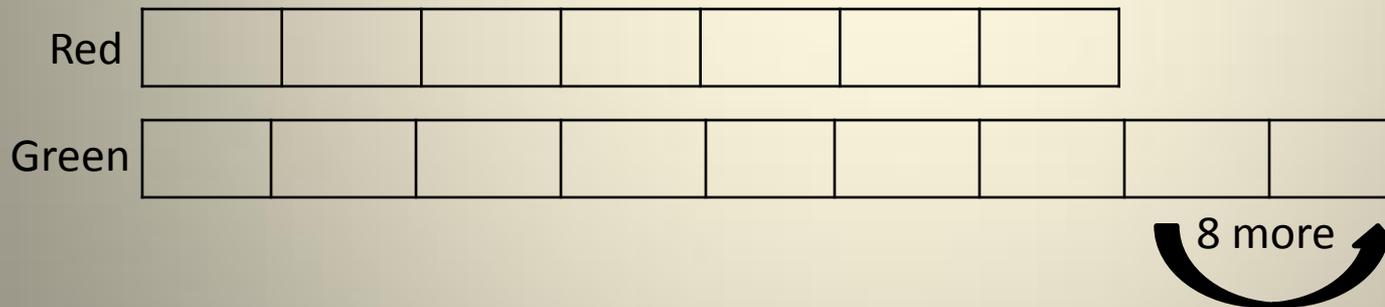
7:9



Step #2

Look in the problem for information that will help you determine the value of each box.

He bought 8 more green apples



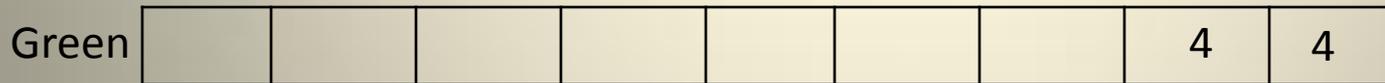
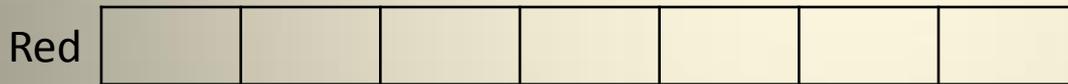
Step #3

Determine the value of each box.

Remember all boxes have an equal value.

He bought 8 more green apples

$$8 \div 2 = 4$$



Step #4

Use the value of the boxes to answer the question in the problem.

How many total apples did he buy?

Red	4	4	4	4	4	4	4
-----	---	---	---	---	---	---	---

Green	4	4	4	4	4	4	4	4	4
-------	---	---	---	---	---	---	---	---	---

$$4 \times 16 = 64$$

He bought 64 apples.

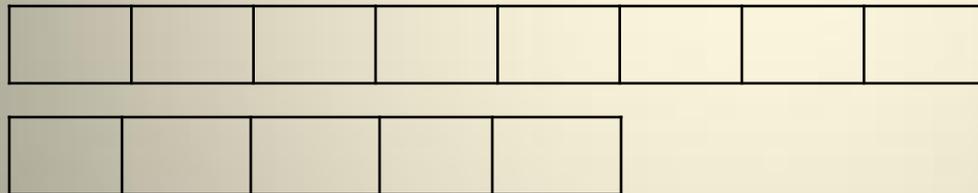
To make Purple Plum paint,
the paint store mixes blue
and red paint in a ratio of 8:5.

If a customer needs 65
gallons of paint, how many
gallons of each color needs to
go into the mix?

Step #1

Look for the ratio in the problem and make a tape diagram.

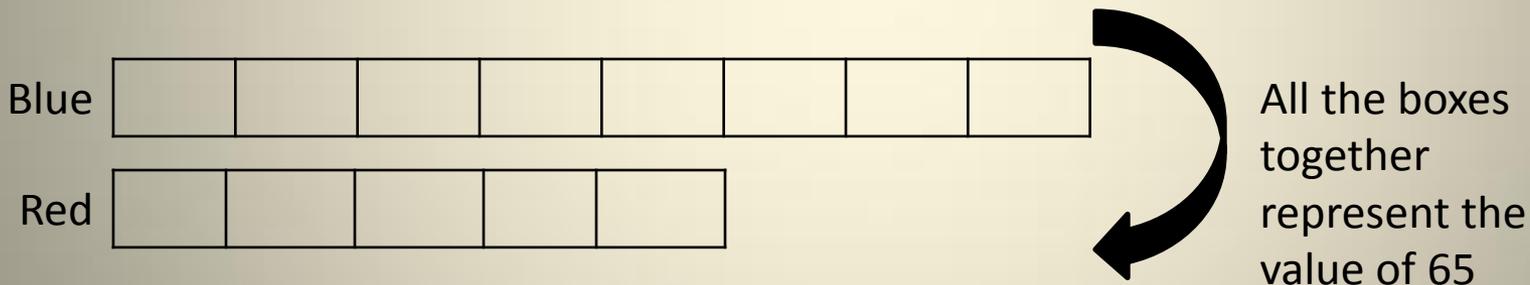
8:5



Step #2

Look in the problem for information that will help you determine the value of each box.

Customer needs 65 gallons of paint

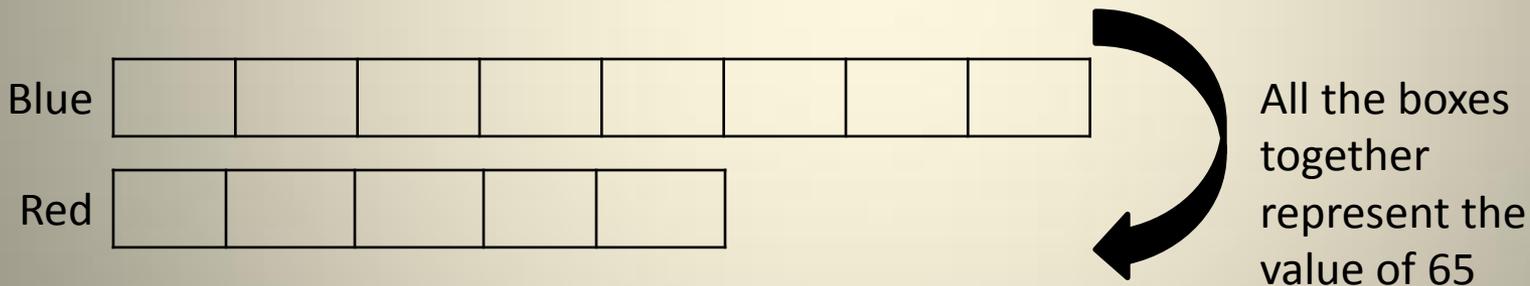


Step #3

Determine the value of each box.

Remember all boxes have an equal value.

Customer needs 65 gallons of paint



$$65 \text{ gallons} \div 13 \text{ boxes} = 5$$

Step #4

Use the value of the boxes to answer the question in the problem.

How many gallons of each color needs to go into the mix?

Blue

--	--	--	--	--	--	--	--

 $8 \times 5 = 40$

Red

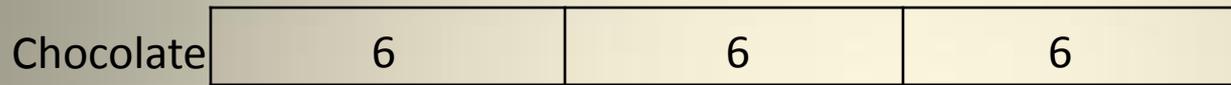
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 $5 \times 5 = 25$

40 gallons of blue paint and **25 gallons** of red paint

Now try some
problems on your
own!

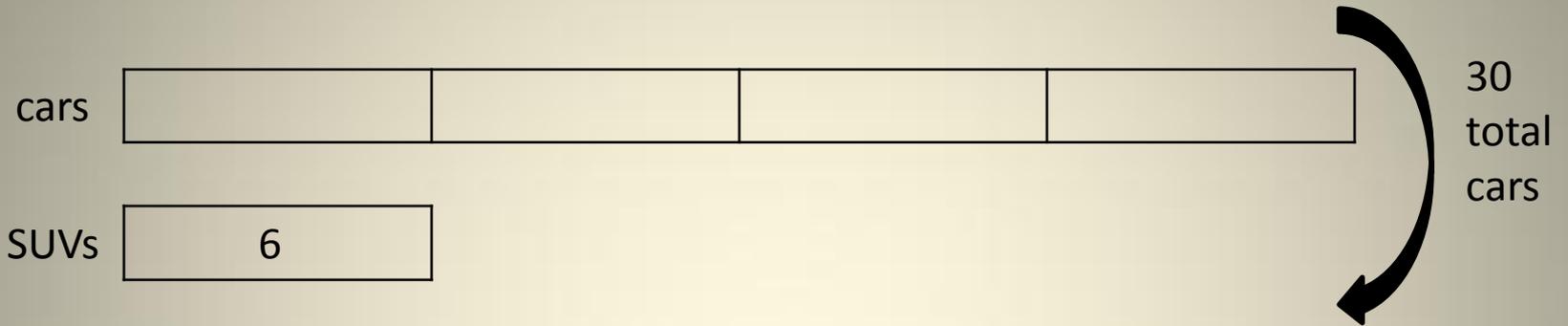
I bought bags of chocolate and bags of nuts in a ratio of 3:4. If I bought 6 more nuts than oranges, how many total bags did I buy?



$$7 \times 6 = 42$$

42 total bags

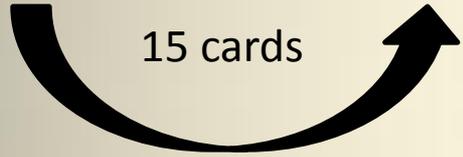
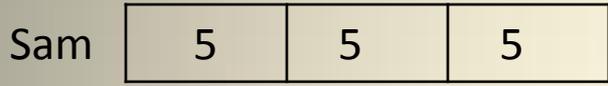
The ratio of the number of cars to SUVs in a parking lot is 4:1. If there are 30 total cars in the parking lot, how many SUVs are there?



$$30 \text{ cars} \div 5 \text{ boxes} = 6$$

There are **6 SUVs** in
the parking lot.

Dylan and Sam share a group of baseball cards in a ratio of 8:3. If Sam has 15 baseball cards, how many does Dylan have?

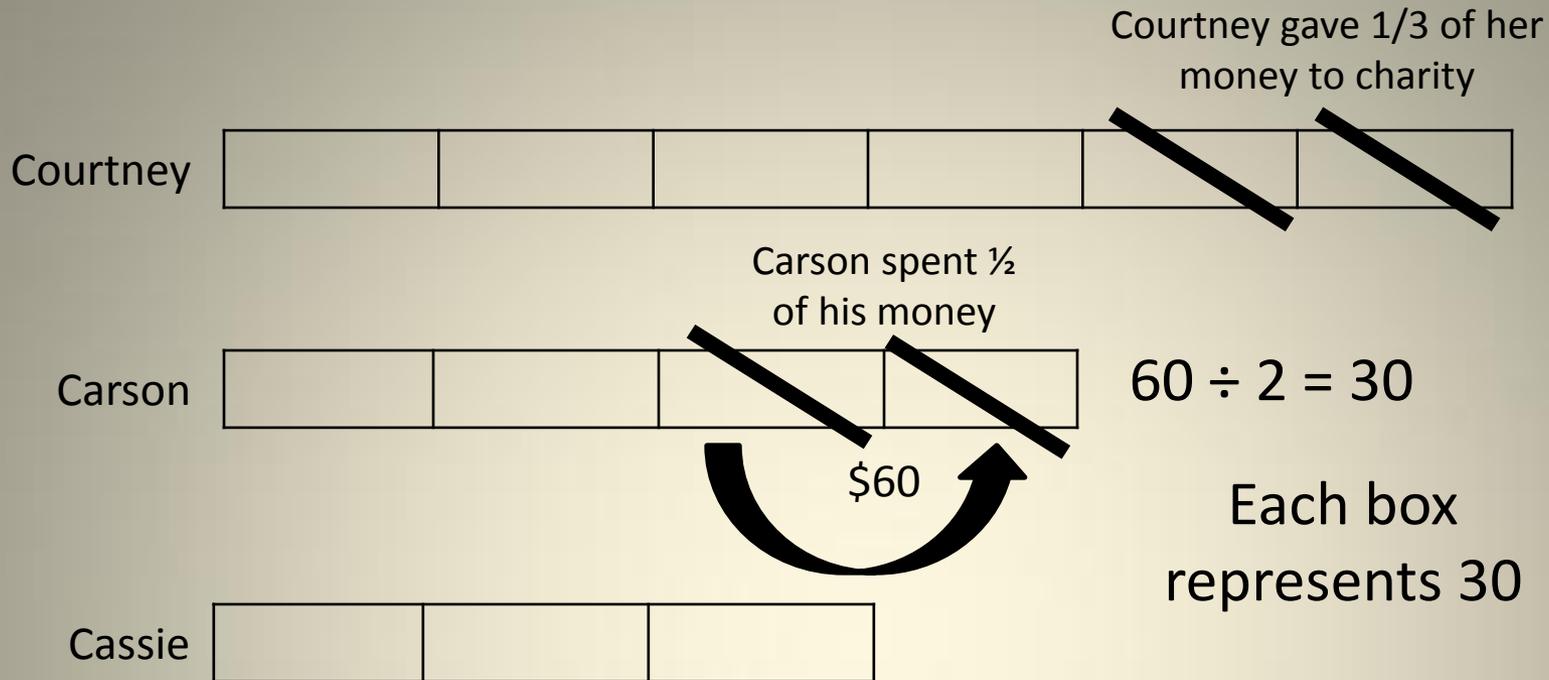


$$15 \div 3 = 5$$

Dylan has 40 baseball cards.

How about a
challenge?

Courtney, Carson, and Cassie share a sum of money in the ratio 6:4:3. Carson used $\frac{1}{2}$ of his money to buy a remote-controlled car that cost \$60, and Courtney gave $\frac{1}{3}$ of her money to charity. How much money do they have left altogether?



Mark off the boxes of spent money.

There are 9 boxes left.

$$9 \times 30 = 270$$

They have \$270 left.

Great Work!