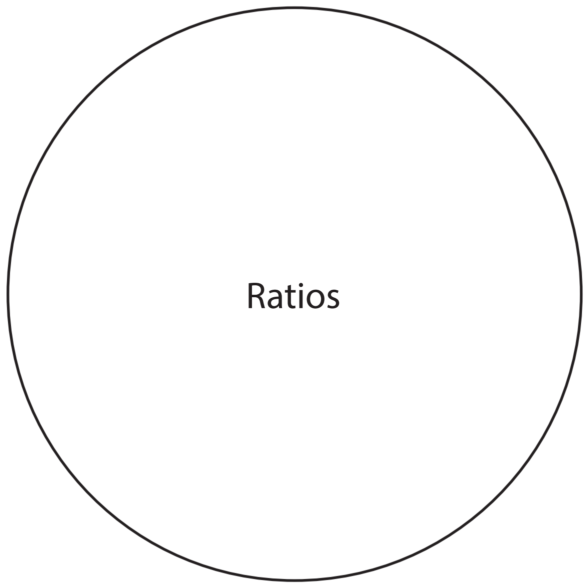
Ratios and Proportions 1

Teacher Masters

The Meadows Center for Preventing Educational Risk—Mathematics Institute

Warming Up:



Learning to Solve:

Find the missing number.

1. $\frac{4}{3} - \frac{2}{3} =$ ________

2. ________ $+ \frac{2}{5} = 1$

3. $\frac{3}{4} -$ ________ $= \frac{3}{8}$

4. $\frac{5}{8} +$ ________ $= \frac{13}{8}$

5. $1 -$ ________ $= \frac{3}{7}$

Learning to Solve:

Find the missing number.

1. $\frac{4}{3} - \frac{2}{3} = \underline{\frac{2}{3}}$

2. $\underline{\frac{3}{5}} + \frac{2}{5} = 1$

3. $\frac{3}{4} - \underline{\frac{3}{8}} = \frac{3}{8}$

4. $\frac{5}{8} + \underline{1 \text{ or } \frac{8}{8}} = \frac{13}{8}$

5. $1 - \underline{\frac{4}{7}} = \frac{3}{7}$

Work with a partner to solve Kara's problem. Think about what picture or diagram you could use to support your answer. What would you tell Kara?

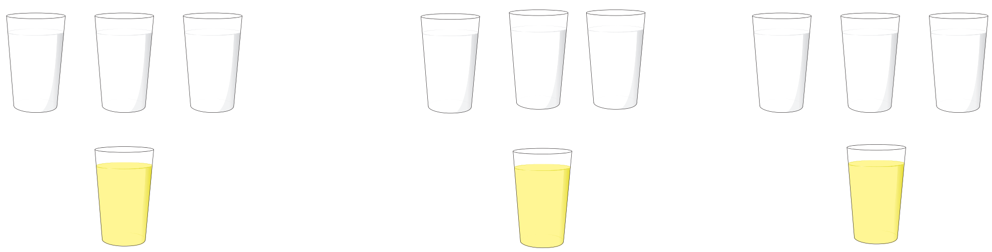
Kara said, "I'm going to make lemonade. For every 3 cups of water, I need 1 cup of lemon juice. But I'm using 9 cups of water. How many cups of lemon juice will I need?"

2 ways to describe the ratios and relationships:

Work with a partner to solve Kara's problem. Think about what picture or diagram you could use to support your answer. What would you tell Kara?

Kara said, "I'm going to make lemonade. For every 3 cups of water, I need 1 cup of lemon juice. But I'm using 9 cups of water. How many cups of lemon juice will I need?"

Some students may use a diagram such as these:



Other diagrams are possible. Any diagram shown should represent the 3 to 1 ratio.

2 ways to describe the ratios and relationships:

3 cups of water to 1 cup of lemon juice

3:1

$\frac{3}{1}$

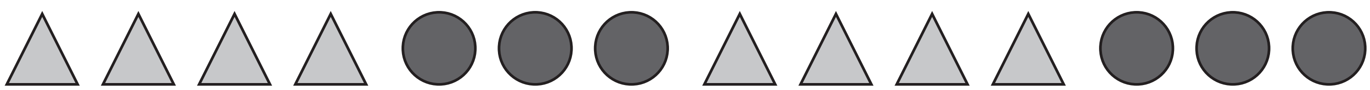
Practicing Together:

With a partner, solve the following problems. Be ready to explain your thinking.

1. Dorie made a mixture of cashews and almonds. She mixed 2 cups of cashews for every cup of almonds. Write a ratio of cashews to almonds to represent her mixture.

_______ : _______

2. Chuck used triangles and circles to make a pattern that repeated.



Write a ratio showing the number of circles to the number of triangles.

_______ : _______

3. Marty had a dog. The dog had 2 collars and 1 leash. Write at least 2 ratios for this situation. Describe the ratio in words.

_______ : _______ and _______ : _______

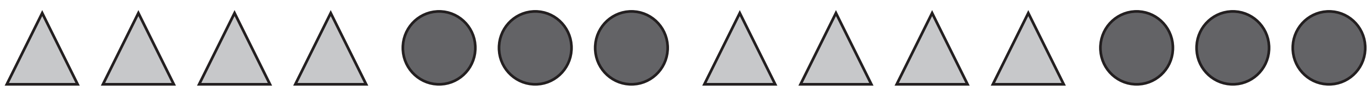
Practicing Together:

With a partner, solve the following problems. Be ready to explain your thinking.

1. Dorie made a mixture of cashews and almonds. She mixed 2 cups of cashews for every cup of almonds. Write a ratio of cashews to almonds to represent her mixture.

___2___ : ___1___ or any equivalent ratio

2. Chuck used triangles and circles to make a pattern that repeated.



Write a ratio showing the number of circles to the number of triangles.

___3___ : ___4___ or any equivalent ratio

3. Marty had a dog. The dog had 2 collars and 1 leash. Write at least 2 ratios for this situation. Describe the ratio in words.

_______ : _______ and _______ : _______

Answers will vary, such as, there are twice as many collars as there are leashes (or dogs). For every leash, there are 2 collars. For every dog, there is 1 leash. Accept any appropriate description.

4. Claire writes the ratio 3:1 to describe the number of wheels on a tricycle to the number of tricycles. Do you agree with Claire?

- **a.** Yes, I agree with Claire because the larger number always goes first in a ratio.
- **b.** Yes, I agree with Claire because there are 3 wheels to every 1 tricycle.
- **c.** No, I disagree with Claire because she should have written 1:3.
- **d.** No, I disagree with Claire because you cannot compare two different quantities.

4. Claire writes the ratio 3:1 to describe the number of wheels on a tricycle to the number of tricycles. Do you agree with Claire?

a. Yes, I agree with Claire because the larger number always goes first in a ratio.

b. Yes, I agree with Claire because there are 3 wheels to every 1 tricycle.

c. No, I disagree with Claire because she should have written 1:3.

d. No, I disagree with Claire because you cannot compare two different quantities.

Trying It on Your Own

Solve each problem.

1. Sheri is making a trail mix that has 2 cups of raisins for every 3 cups of peanuts. Which of the following shows the ratio of peanuts to raisins?

- **a.** 2:3
- **b.** 2:1
- **c.** 3:1
- **d.** 3:2

2. Aaron wrote the ratio 1:4. He said this represented the ratio of the number of legs to the number of dogs. Do you agree with Aaron?

- **a.** No, I do not agree with Aaron because you cannot write a ratio with 2 different things like legs and dogs.
- **b.** No, I do not agree with Aaron because his ratio is the number of dogs to the number of legs.
- **c.** Yes, I agree with Aaron because you can write the ratio as either 1:4 or 4:1. It doesn't matter.
- **d.** Yes, I agree with Aaron because every dog has 4 legs.

Trying It on Your Own

Solve each problem.

1. Sheri is making a trail mix that has 2 cups of raisins for every 3 cups of peanuts. Which of the following shows the ratio of peanuts to raisins?

a. 2:3

b. 2:1

c. 3:1

d. 3:2

2. Aaron wrote the ratio 1:4. He said this represented the ratio of the number of legs to the number of dogs. Do you agree with Aaron?

a. No, I do not agree with Aaron because you cannot write a ratio with 2 different things like legs and dogs.

b. No, I do not agree with Aaron because his ratio is the number of dogs to the number of legs.

c. Yes, I agree with Aaron because you can write the ratio as either 1:4 or 4:1. It doesn't matter.

d. Yes, I agree with Aaron because every dog has 4 legs.

3. Which of the following describes a situation that represents a ratio of 3:5?

a. Carrie made a recipe that used $\frac{3}{5}$ cup of flour.

b. Carrie made fruit punch by using 3 cups of pineapple juice for 5 cups of orange juice.

c. Carrie made a fruit punch by using $\frac{1}{5}$ cup of orange juice and $\frac{1}{3}$ cup of pineapple juice.

d. Carrie made a recipe that used $\frac{5}{3}$ cup of flour.

4. Shaun wrote the ratio 5:8 to show the number of cups of almonds to the number of cups of chocolate candies in a trail mix. He makes a batch, using this ratio. How many total cups of trail mix will he have?

a. 5 cups
b. 8 cups
c. 13 cups
d. 3 cups

3. Which of the following describes a situation that represents a ratio of 3:5?

a. Carrie made a recipe that used $\frac{3}{5}$ cup of flour.

b. Carrie made fruit punch by using 3 cups of pineapple juice for 5 cups of orange juice.

c. Carrie made a fruit punch by using $\frac{1}{5}$ cup of orange juice and $\frac{1}{3}$ cup of pineapple juice.

d. Carrie made a recipe that used $\frac{5}{3}$ cup of flour.

4. Shaun wrote the ratio 5:8 to show the number of cups of almonds to the number of cups of chocolate candies in a trail mix. He makes a batch, using this ratio. How many total cups of trail mix will he have?

a. 5 cups
b. 8 cups
c. 13 cups
d. 3 cups

Wrapping It Up

Describe a situation that can be represented by the ratio 1:4.

Wrapping It Up

Describe a situation that can be represented by the ratio 1:4.

Answers will vary, such as, the number of dogs to number of legs. Accept any equivalent description.

Warming Up:

Find the missing number.

1. $\frac{2}{3} + \_\_\_\_\_\_ = \frac{6}{3}$

2. $\frac{1}{2} - \frac{1}{3} = \_\_\_\_\_\_$

3. $\_\_\_\_\_\_ + \frac{3}{7} = 2$

4. $\frac{3}{8} - \_\_\_\_\_\_ = \frac{3}{16}$

Warming Up:

Find the missing number.

1. $\frac{2}{3} + \underline{\frac{4}{3}} = \frac{6}{3}$

2. $\frac{1}{2} - \frac{1}{3} = \underline{\frac{1}{6}}$

3. $\underline{\frac{11}{7}} + \frac{3}{7} = 2$

4. $\frac{3}{8} - \underline{\frac{3}{16}} = \frac{3}{16}$

Learning to Solve:

1. Jon said, "Every rectangle has 4 sides. I can write a ratio of 1:4. This means that for every rectangle, there are 4 sides."

A. Write a ratio Jon could use to show the number of sides for every triangle.

_______ : _______ or _______ : _______

B. Write the ratio in words.

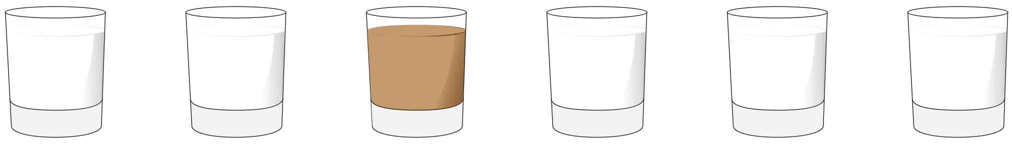
C. Write the ratio Jon could use to show the number sides for every hexagon.

_______ : _______ or _______ : _______

D. Write the ratio in words.

2. Look at the ratio of chocolate milk to white milk.

1:5 $\frac{1}{5}$



Word form:

Learning to Solve:

1. Jon said, "Every rectangle has 4 sides. I can write a ratio of 1:4. This means that for every rectangle, there are 4 sides."

A. Write a ratio Jon could use to show the number of sides for every triangle.

1 : 3 or 3 : 1

B. Write the ratio in words.

Answers will vary, such as, for every triangle, there are 3 sides.

C. Write the ratio Jon could use to show the number sides for every hexagon.

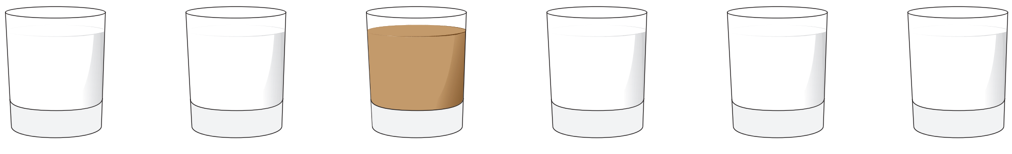
1 : 6 or 6 : 1

D. Write the ratio in words.

Answers will vary, such as, for every hexagon, there are 6 sides.

2. Look at the ratio of chocolate milk to white milk.

1:5 $\frac{1}{5}$



Word form:

There is 5 times as much white milk as there is chocolate milk or there is one-fifth as much chocolate milk as there is white milk.

Practicing Together

We are going to play 3-in-a-Row. You will play in pairs. The object of the game is to be the first one to get 3 counters in a row, up, down, or diagonal. The first person will take a card. Look at the ratio of shaded to unshaded parts. Find a picture on the game sheet that matches the ratio. Place your color counter on the picture. The second person will draw a card and place the counter on your picture. Be careful—some ratios may have more than 1 picture that matches so make your choice carefully.

Trying It on Your Own

1. Marty said, "The ratio of 1:8 shows the relationship of the number of octagons to the number of sides." Which of the following is another way to describe this relationship?

a. There are 8 times as many octagons as there are sides.

b. There are 8 times as many sides as there are octagons.

c. Some octagons will have 8 sides.

d. For every 8 octagons, there will be 8 sides.

2. Shelli said, "I have one-third as many movies as I have books." Which of the following describes this relationship?

a. 1 book to 3 movies

b. $\frac{1}{3}$ book to 3 movies

c. 3 books to 1 movie

d. 3 books to $\frac{1}{3}$ movie

Trying It on Your Own

1. Marty said, "The ratio of 1:8 shows the relationship of the number of octagons to the number of sides." Which of the following is another way to describe this relationship?

- **a.** There are 8 times as many octagons as there are sides.
- **b.** There are 8 times as many sides as there are octagons.
- **c.** Some octagons will have 8 sides.
- **d.** For every 8 octagons, there will be 8 sides.

2. Shelli said, "I have one-third as many movies as I have books." Which of the following describes this relationship?

- **a.** 1 book to 3 movies
- **b.** $\frac{1}{3}$ book to 3 movies
- **c.** 3 books to 1 movie
- **d.** 3 books to $\frac{1}{3}$ movie

3. Which ratio shows 5 times as many tablespoons of chocolate as there are cups of milk?

a. $\frac{1}{5}$ to 1, tablespoons of chocolate to cups of milk

b. 5 to 1, tablespoons of chocolate to cups of milk

c. 1 to $\frac{1}{5}$, tablespoons of chocolate to cups of milk

d. 5 to 5, tablespoons of chocolate to cups of milk

4. Cara wrote the ratio 5:10 to compare the number of red beads to the number of yellow beads in her bracelet. Which of the following gives 2 ways to describe this ratio?

a. Cara has twice as many yellow beads as she has red beads. She has half as many yellow beads as she has red beads.

b. Cara has twice as many yellow beads as she has red beads. She has half as many red beads as she has yellow beads.

c. Cara has twice as many red beads as she has yellow beads. She has half as many yellow beads as she has red beads.

d. Cara has twice as many red beads as she has yellow beads. She has half as many red beads as she has yellow beads.

3. Which ratio shows 5 times as many tablespoons of chocolate as there are cups of milk?

a. $\frac{1}{5}$ to 1, tablespoons of chocolate to cups of milk

b. 5 to 1, tablespoons of chocolate to cups of milk

c. 1 to $\frac{1}{5}$, tablespoons of chocolate to cups of milk

d. 5 to 5, tablespoons of chocolate to cups of milk

4. Cara wrote the ratio 5:10 to compare the number of red beads to the number of yellow beads in her bracelet. Which of the following gives 2 ways to describe this ratio?

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b. Cara has twice as many yellow beads as she has red beads. She has half as many red beads as she has yellow beads.

c. Cara has twice as many red beads as she has yellow beads. She has half as many yellow beads as she has red beads.

d. Cara has twice as many red beads as she has yellow beads. She has half as many red beads as she has yellow beads.

Wrapping It Up

Work with a partner to solve each problem.

1. Write a ratio of peanuts to chocolate chips that shows 4 times as many peanuts as there are chocolate chips in a trail mix.

_______ : _______

Write the ratio in another way.

_______ : _______

3. Shay said, "I have half as many books as I have magazines." Write a ratio that shows the comparison of books to magazines. Write in words the relationship that the ratio shows.

_______ books : _______ magazines

In words:

Wrapping It Up

Work with a partner to solve each problem.

1. Write a ratio of peanuts to chocolate chips that shows 4 times as many peanuts as there are chocolate chips in a trail mix.

__4__ : __1__

Write the ratio in another way.

__1__ : __$\frac{1}{4}$__

3. Shay said, "I have half as many books as I have magazines." Write a ratio that shows the comparison of books to magazines. Write in words the relationship that the ratio shows.

__1__ books : __2__ magazines

In words:
For every book, there are 2 magazines.

Warming Up:

Write the ratio.

1. number of squares : number of sides

_______ : _______

2. number of legs : number of dogs

_______ : _______

3. number of pennies : number of dollars

_______ : _______

Warming Up:

Write the ratio.

1. number of squares : number of sides

___1___ : ___4___ or any equivalent ratio, such as, 2:8

2. number of legs : number of dogs

___4___ : ___1___ or any equivalent ratio, such as, 12:3

3. number of pennies : number of dollars

___100___ : ___1___ or any equivalent ratio, such as, 500:5

Learning to Solve:

1. Derek said, "I made a fruit salad by using a ratio of 2 apples to 4 oranges."

"I made a salad, too," said Courtney. "I used 1 apple to 2 oranges."

"Your salads have the same ratio," said Ben.

Do you agree with Ben? Draw a picture or a diagram to support your answer.

Learning to Solve:

1. Derek said, "I made a fruit salad by using a ratio of 2 apples to 4 oranges."

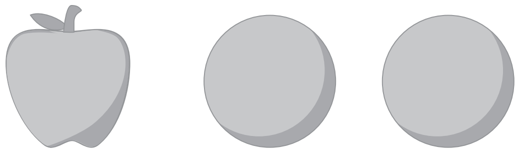
"I made a salad, too," said Courtney. "I used 1 apple to 2 oranges."

"Your salads have the same ratio," said Ben.

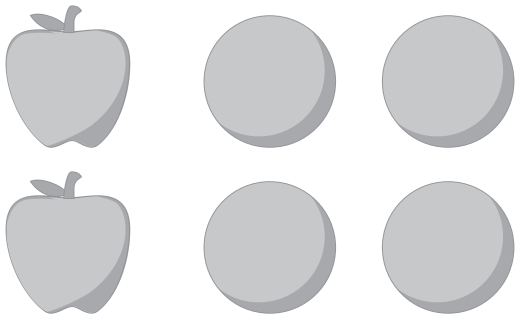
Do you agree with Ben? Draw a picture or a diagram to support your answer.

Students should agree with Ben. There are many different diagrams that can be used to support the answer. For example:

Courtney's salad:



Derek's salad:



Practicing Together

Work with a partner to solve each problem.

1. Do the ratios 1:3 and 3:9 represent the same relationship? _______

Draw a diagram or a picture to support your answer, using apples and oranges.

2. Do the ratios 2:4 and 1:2 represent the same relationship? _______

Draw a diagram or a picture to support your answer, using apples and oranges.

3. Do the ratios 1:3 and 3:5 represent the same relationship? _______

Draw a diagram or a picture to support your answer, using apples and oranges.

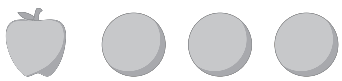
Practicing Together

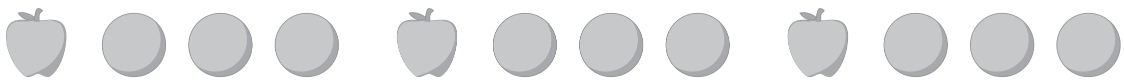
Work with a partner to solve each problem.

1. Do the ratios 1:3 and 3:9 represent the same relationship? Yes

Draw a diagram or a picture to support your answer, using apples and oranges.

Answers will vary. Emphasize responses that show the unit of 1:3.


shows 1:3.

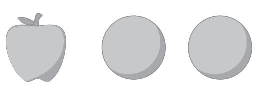

shows 3:9.

There are 3 units of 1:3 in the second diagram.

2. Do the ratios 2:4 and 1:2 represent the same relationship? Yes

Draw a diagram or a picture to support your answer, using apples and oranges.

Answers will vary. Emphasize responses that show the unit of 1:2.


shows 1:2.

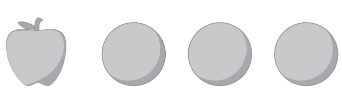

shows 2:4.

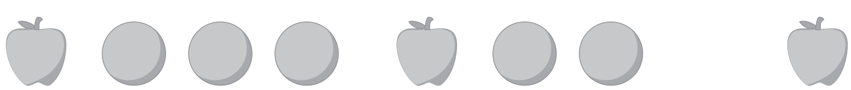
There are 2 units of 1:2 in the second diagram.

3. Do the ratios 1:3 and 3:5 represent the same relationship? No

Draw a diagram or a picture to support your answer, using apples and oranges.

This is an additive relationship.


shows 1:3.


shows 3:5.

There are not enough oranges to make units of 1:3 in the second diagram.

4. Taylor wrote the ratio 1:3 to show the number of triangles compared to the number of sides. Jon wrote the ratio 7:9. Do you agree that Jon wrote an equivalent ratio?

a. Yes, I agree because all of the numbers in the ratio are odd numbers.

b. Yes, I agree because 1 + 6 = 7, and 3 + 6 = 9. The same number was added to both.

c. No, I do not agree because 7 triangles would have 21 sides, not 9.

d. No, I do not agree because 1 + 3 = 4 and 7 + 9 = 16.

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c. No, I do not agree because 7 triangles would have 21 sides, not 9.

d. No, I do not agree because 1 + 3 = 4 and 7 + 9 = 16.

Trying It on Your Own

1. For every dog, there are 4 legs. The ratio of the number of dogs to the number of legs is written as 1:4. If there were 3 dogs, what would the ratio be?

a. 3:12

b. 12:3

c. 3:4

d. 4:3

2. Kerry wrote the ratio 2:8 to show the relationship between the number of squares and the number of sides of a square. Jim wrote the ratio 3:9 to show the same relationship. Are these ratios the same or equivalent?

a. No, they are not equivalent because Jim's ratio has odd numbers and Kerry's ratio has even numbers.

b. No, they are not equivalent because Kerry's ratio cannot be written as 1:3.

c. Yes, they are equivalent because in each ratio you can add 6 to the first number to get the second number.

d. Yes, they are equivalent because they both show the number of the shapes to the number of sides.

Trying It on Your Own

1. For every dog, there are 4 legs. The ratio of the number of dogs to the number of legs is written as 1:4. If there were 3 dogs, what would the ratio be?

a. 3:12
b. 12:3
c. 3:4
d. 4:3

2. Kerry wrote the ratio 2:8 to show the relationship between the number of squares and the number of sides of a square. Jim wrote the ratio 3:9 to show the same relationship. Are these ratios the same or equivalent?

a. No, they are not equivalent because Jim's ratio has odd numbers and Kerry's ratio has even numbers.
b. No, they are not equivalent because Kerry's ratio cannot be written as 1:3.
c. Yes, they are equivalent because in each ratio you can add 6 to the first number to get the second number.
d. Yes, they are equivalent because they both show the number of the shapes to the number of sides.

3. Ed wrote the ratio 1:3 to show the relationship between the number of triangles to the number of sides of a triangle. Which ratio shows the same relationship?

a. 3:1

b. 3:5

c. 7:9

d. 7:21

4. Meg's mom asked her to make some fruit punch. The recipe said to use a ratio of 3:4 for orange juice to cranberry juice. Meg decided to make 4 times as much, or 4 recipes of the fruit punch. How much orange juice and cranberry juice will she need?

a. 7 cups of orange juice and 8 cups of cranberry juice

b. 12 cups of orange juice and 8 cups of cranberry juice

c. 12 cups of orange juice and 16 cups of cranberry juice

d. 8 cups of orange juice and 7 cups of cranberry juice

3. Ed wrote the ratio 1:3 to show the relationship between the number of triangles to the number of sides of a triangle. Which ratio shows the same relationship?

a. 3:1
b. 3:5
c. 7:9
d. 7:21

4. Meg's mom asked her to make some fruit punch. The recipe said to use a ratio of 3:4 for orange juice to cranberry juice. Meg decided to make 4 times as much, or 4 recipes of the fruit punch. How much orange juice and cranberry juice will she need?

a. 7 cups of orange juice and 8 cups of cranberry juice
b. 12 cups of orange juice and 8 cups of cranberry juice
c. 12 cups of orange juice and 16 cups of cranberry juice
d. 8 cups of orange juice and 7 cups of cranberry juice

Wrapping It Up

We are going to play 3-in-a-Row. You will play in pairs. The object of the game is to be the first one to get 3 counters in a row, up, down, or diagonal. The first person will take a card. Look at the ratio of shaded to unshaded parts. Find a picture on the game sheet that matches the ratio. Place your color counter on the picture. The second person will draw a card and place the counter on your picture. Be careful—some ratios may have more than 1 picture that matches so make your choice carefully.

Warming Up:

Directions:

We are going to play Equivalent Ratios. Each pair will use a deck of cards with 4 of each card; there are no face cards. The aces in the deck represent 1. You have 4 1s, 4 2s, and so on, all the way up to 10. One person in your pair will shuffle the cards and deal 8 cards to each of you. The remaining cards will go in the middle of the table, with the top card turned over.

You will look at your cards and try to find 4 cards that will make 2 ratios that are equivalent. For example, if I had the cards 2, 5, 10, and 1, I could make the ratios 1:2 and 5:10. They are equivalent. If you cannot make equivalent ratios, you may take the card that is showing in the middle of the table, and discard one of your cards. You keep playing until one of you makes all of your cards into ratios. If the game ends before no player has no cards left, the player who has made the most matching ratios wins.

Learning to Solve:

1. Courtney and Derek wanted to make a large salad that had a ratio of 1 pear to 3 apples. They have 4 pears they can use. How many apples should they use to keep the ratio 1 pear to 3 apples? Draw a diagram or picture, and write at least 3 sentences to explain your thinking.

2. Deb and Hal made a vegetable salad. For every carrot, they used 2 radishes.

A. If they use 3 carrots, how many radishes will they need to keep it in the same ratio?

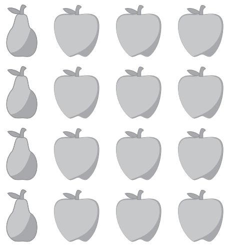
B. Write the proportion this represents, using both fraction form and colon form.

C. If they use 5 carrots, how many radishes will they need to keep it in the same ratio? Explain how you decided.

D. Write the proportion this represents, using both fraction form and colon form.

Learning to Solve:

1. Courtney and Derek wanted to make a large salad that had a ratio of 1 pear to 3 apples. They have 4 pears they can use. How many apples should they use to keep the ratio 1 pear to 3 apples? Draw a diagram or picture, and write at least 3 sentences to explain your thinking.



Example sentences: For every pear, there are 3 apples. The drawing shows 4 groups because the amount to make is 4 times larger than the unit ratio. There are 3 apples in each group for a total of 12 apples.

2. Deb and Hal made a vegetable salad. For every carrot, they used 2 radishes.

A. If they use 3 carrots, how many radishes will they need to keep it in the same ratio?

6 radishes

B. Write the proportion this represents, using both fraction form and colon form.

1:2::3:6 or $\frac{1}{2} = \frac{3}{6}$

C. If they use 5 carrots, how many radishes will they need to keep it in the same ratio? Explain how you decided.

10 radishes

D. Write the proportion this represents, using both fraction form and colon form.

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

Practicing Together

Work with a partner to solve each problem.

Jon has a collection of marbles. For every 3 blue marbles, he has 9 orange marbles.

1. What is the ratio that describes the relationship of the number of blue marbles to the number of orange marbles?

2. If his collection has a total of 21 blue marbles, how many orange marbles will he have?

3. If his collection has a total of 45 orange marbles, how many blue marbles will he have?

4. Complete the proportion that describes this collection of marbles: $\frac{1}{3} = \frac{\_\_\_}{12}$

Practicing Together

Work with a partner to solve each problem.

Jon has a collection of marbles. For every 3 blue marbles, he has 9 orange marbles.

1. What is the ratio that describes the relationship of the number of blue marbles to the number of orange marbles?

1:3 or 3:9 or $\frac{1}{3}$ or $\frac{3}{9}$

2. If his collection has a total of 21 blue marbles, how many orange marbles will he have?

63 orange marbles

3. If his collection has a total of 45 orange marbles, how many blue marbles will he have?

15 blue marbles

4. Complete the proportion that describes this collection of marbles: $\frac{1}{3} = \frac{4}{12}$

4. Chanel made the ratio of 4 apples to 7 bananas. Kory made the ratio of 8 dogs to 14 cats. Are these ratios equivalent?

a. Yes, they are equivalent because they are both 1:2.

b. No, they are not equivalent because 8 – 4 = 4 and 14 – 7 = 7.

c. Yes, they are equivalent because 4 + 4 = 8 and 7 + 7 = 14.

d. No, they are not equivalent because one ratio is comparing apples to bananas and the other is comparing dogs to cats.

4. Chanel made the ratio of 4 apples to 7 bananas. Kory made the ratio of 8 dogs to 14 cats. Are these ratios equivalent?

a. Yes, they are equivalent because they are both 1:2.

b. No, they are not equivalent because 8 – 4 = 4 and 14 – 7 = 7.

c. Yes, they are equivalent because 4 + 4 = 8 and 7 + 7 = 14.

d. No, they are not equivalent because one ratio is comparing apples to bananas and the other is comparing dogs to cats.

Trying It on Your Own

Solve problems 1, 2, and 3, using this information:

Mike made a snack mix. He used 2 cups of almonds for every cup of raisins.

1. If Mike puts in 10 cups of almonds, how many cups of raisins would he use?

- **a.** 2 cups
- **b.** 5 cups
- **c.** 9 cups
- **d.** 10 cups

2. Select 2 ratios that represent Mike's relationship.

- **a.** 2:1 and 10:2
- **b.** 2:1 and 10:5
- **c.** 2:1 and 10:9
- **d.** 2:1 and 10:10

Trying It on Your Own

Solve problems 1, 2, and 3, using this information:

Mike made a snack mix. He used 2 cups of almonds for every cup of raisins.

1. If Mike puts in 10 cups of almonds, how many cups of raisins would he use?

a. 2 cups
b. 5 cups
c. 9 cups
d. 10 cups

2. Select 2 ratios that represent Mike's relationship.

a. 2:1 and 10:2
b. 2:1 and 10:5
c. 2:1 and 10:9
d. 2:1 and 10:10

3. If Mike puts in 7 cups of raisins, how many cups of almonds would he use?

a. 14 cups
b. 9.5 cups
c. 7 cups
d. 3.5 cups

4. Which of the following shows 2 equivalent ratios?

a. 1:5 (number of pentagons to number of sides) and 2:5 (number of cups of milk to number of teaspoons of chocolate)
b. 1:4 (number of quadrilaterals to number of sides) and 3:8 (number of dogs to number of legs)
c. 1:3 (number of triangles to number of sides) and 3:5 (number of triangles to number of sides)
d. 1:2 (number of bicycles to number of wheels) and 12:24 (number of bicycles to number of wheels)

3. If Mike puts in 7 cups of raisins, how many cups of almonds would he use?

- **a.** 14 cups
- **b.** 9.5 cups
- **c.** 7 cups
- **d.** 3.5 cups

4. Which of the following shows 2 equivalent ratios?

- **a.** 1:5 (number of pentagons to number of sides) and 2:5 (number of cups of milk to number of teaspoons of chocolate)
- **b.** 1:4 (number of quadrilaterals to number of sides) and 3:8 (number of dogs to number of legs)
- **c.** 1:3 (number of triangles to number of sides) and 3:5 (number of triangles to number of sides)
- **d.** 1:2 (number of bicycles to number of wheels) and 12:24 (number of bicycles to number of wheels)

Wrapping It Up

Decide whether this proportion is a true statement:

1:4::4:12

Wrapping It Up

Decide whether this proportion is a true statement:

1:4::4:12

Students should indicate this is not true. There are multiple ways they could explain their answer. Some may notice that 4 is 4 times larger than 1 but 12 is not 4 times larger than 4. Others may write it in fraction form and think about the simplest form of the fraction $\frac{4}{12}$.

Warming Up:

1. Is the ratio 4:24 equivalent to the ratio 1:6? Explain your reasoning.

2. Is the ratio 1:8 equivalent to the ratio 2:9? Explain your reasoning.

Warming Up:

1. Is the ratio 4:24 equivalent to the ratio 1:6? Explain your reasoning.

Yes. Explanations may vary. Some students may indicate that 24 • 1 = 24, and 6 • 4 = 24. Others may use a diagram or drawing or describe a way to show that an equivalent ratio for 4:24 is 1:6.

2. Is the ratio 1:8 equivalent to the ratio 2:9? Explain your reasoning.

No. Explanations may vary. Some students may indicate that 1 • 9 = 9, but 8 • 2 = 16. Others may use a diagram or drawing or describe a way to show that the ratios are not equivalent.

Learning to Solve:

Pat made a fruit punch. For every 3 cups of pineapple juice, he used 2 cups of orange juice.

1. Write the ratio of the number of cups of orange juice to the number of cups of pineapple juice.

2. Pat used 9 cups of pineapple juice. How many cups of orange does he need to keep the same ratio?

3. Write the proportion that shows this relationship.

4. Pat used 10 cups of orange juice. How many cups of pineapple juice does he need to keep the same ratio?

5. Write the proportion that shows this relationship.

Learning to Solve:

Pat made a fruit punch. For every 3 cups of pineapple juice, he used 2 cups of orange juice.

1. Write the ratio of the number of cups of orange juice to the number of cups of pineapple juice.

2:3 or $\frac{2}{3}$

2. Pat used 9 cups of pineapple juice. How many cups of orange does he need to keep the same ratio?

6 cups of orange juice

3. Write the proportion that shows this relationship.

$\frac{2}{3} = \frac{6}{9}$ or 2:3::6:9

4. Pat used 10 cups of orange juice. How many cups of pineapple juice does he need to keep the same ratio?

15 cups of pineapple juice

5. Write the proportion that shows this relationship.

$\frac{2}{3} = \frac{10}{15}$ or 2:3::10:15

Cora made fruit punch using 3 cups of cranberry juice for every 4 cups of orange juice.

6. Write the ratio that represents this relationship.

7. Cora used 16 cups of orange juice to make a large batch of the punch. How many cups of cranberry juice does she need? What proportion would you write to represent the problem?

8. Find the number of cups of cranberry juice Cora needs.

Cora made fruit punch using 3 cups of cranberry juice for every 4 cups of orange juice.

6. Write the ratio that represents this relationship.

3:4 or $\frac{3}{4}$

7. Cora used 16 cups of orange juice to make a large batch of the punch. How many cups of cranberry juice does she need? What proportion would you write to represent the problem?

3:4::*x*:16 or $\frac{3}{4} = \frac{x}{16}$

8. Find the number of cups of cranberry juice Cora needs.

12 cups

Debrief on problem 8:

$$4 \times 4 = 16$$
$$3 \times 4 = 12$$

Cora made a batch of fruit punch that was 4 times larger than her original ratio.

The 3 and 16 are the extremes (the ends), 4 and 12 are the means (the middle).

$$3 \times 16 = 48$$
$$4 \times 12 = 48$$

Check the ratios 2:5::4:10, using this property.

$$2 \times 10 = 20$$
$$5 \times 4 = 20$$

$$\frac{2}{5} = \frac{4}{10}$$

$$2 \times 10 = 20$$
$$5 \times 4 = 20$$

Check these ratios in fraction form:

$$\frac{2}{5} = \frac{6}{15}$$

$$2 \times 15 = 30$$
$$5 \times 6 = 30$$

Practicing Together

Work with a partner to solve each problem.

Use multiplication or unit rates to decide whether the following ratios are equivalent. Show your work.

1. 4:5 and 12:15

Equivalent Not Equivalent

2. $\frac{2}{8}$ and $\frac{3}{12}$

Equivalent Not Equivalent

3. $\frac{4}{10}$ and $\frac{10}{25}$

Equivalent Not Equivalent

Practicing Together

Work with a partner to solve each problem.

Use multiplication or unit rates to decide whether the following ratios are equivalent. Show your work.

1. 4:5 and 12:15

Equivalent Not Equivalent

2. $\frac{2}{8}$ and $\frac{3}{12}$

Equivalent Not Equivalent

3. $\frac{4}{10}$ and $\frac{10}{25}$

Equivalent Not Equivalent

4. Liza said, "$\frac{3}{5}$ is equivalent to $\frac{9}{11}$." Do you agree with Liza?

- **a.** Yes, I agree with Liza because $3 \times 3 = 9$.
- **b.** Yes, I agree because $3 + 6 = 9$ and $5 + 6 = 11$.
- **c.** No, I do not agree because $3 \times 9 = 27$ and $5 \times 11 = 55$.
- **d.** No, I do not agree because $3 \times 11 = 33$ and $5 \times 9 = 45$.

4. Liza said, "$\frac{3}{5}$ is equivalent to $\frac{9}{11}$." Do you agree with Liza?

a. Yes, I agree with Liza because $3 \times 3 = 9$.

b. Yes, I agree because $3 + 6 = 9$ and $5 + 6 = 11$.

c. No, I do not agree because $3 \times 9 = 27$ and $5 \times 11 = 55$.

d. No, I do not agree because $3 \times 11 = 33$ and $5 \times 9 = 45$.

Trying It on Your Own

Solve the problems on your own.

1. Are the ratios 6:14 and 3:7 equivalent?

a. No, they are not equivalent because $6 + 8 = 14$, but $3 + 6 \neq 7$.

b. No, they are not equivalent because 6 and 14 are even numbers and 3 and 7 are odd numbers.

c. Yes, they are equivalent because they have the same unit rate.

d. Yes, they are equivalent because 3:7 cannot be divided.

2. Are the ratios 8:6 and 4:3 equivalent?

a. No they are not equivalent because the bigger number is first.

b. No, they are not equivalent because $6 + 2 = 8$ but $3 + 2$ does not equal 4.

c. Yes, they are equivalent because $\frac{4}{3} \times \frac{2}{2} = \frac{8}{6}$.

d. Yes, they are equivalent because 4:3 is the same as $\frac{3}{4}$.

Trying It on Your Own

Solve the problems on your own.

1. Are the ratios 6:14 and 3:7 equivalent?

a. No, they are not equivalent because $6 + 8 = 14$, but $3 + 6 \neq 7$.

b. No, they are not equivalent because 6 and 14 are even numbers and 3 and 7 are odd numbers.

c. Yes, they are equivalent because they have the same unit rate.

d. Yes, they are equivalent because 3:7 cannot be divided.

2. Are the ratios 8:6 and 4:3 equivalent?

a. No they are not equivalent because the bigger number is first.

b. No, they are not equivalent because $6 + 2 = 8$ but $3 + 2$ does not equal 4.

c. Yes, they are equivalent because $\frac{4}{3} \times \frac{2}{2} = \frac{8}{6}$.

d. Yes, they are equivalent because 4:3 is the same as $\frac{3}{4}$.

3. Find the missing value in the proportion 3:4::15:*x*

a. The missing value is 20 because 15 is 5 times greater than 3, so 20 is 5 times greater than 4.

b. The missing value is 16 because the difference between 3 and 4 is 1 and 15 is 12 is 3.

c. The missing value is 5 because 15 divided by 3 is 5.

d. It is not possible to determine the missing value.

4. Find the missing value: $\frac{5}{12} = \frac{x}{60}$

a. The missing value is 53 because 5 + 7 = 12.

b. The missing value is 53 because 60 – 7 = 53.

c. The missing value is 25 because the product of 5 and 60 is 300.

d. The missing value is 25 because the product of 5 and 60 is 300 and the product of 12 and 25 is 300.

3. Find the missing value in the proportion 3:4::15:x

a. The missing value is 20 because 15 is 5 times greater than 3, so 20 is 5 times greater than 4.

b. The missing value is 16 because the difference between 3 and 4 is 1 and 15 is 12 is 3.

c. The missing value is 5 because 15 divided by 3 is 5.

d. It is not possible to determine the missing value.

4. Find the missing value: $\frac{5}{12} = \frac{x}{60}$

a. The missing value is 53 because 5 + 7 = 12.

b. The missing value is 53 because 60 – 7 = 53.

c. The missing value is 25 because the product of 5 and 60 is 300.

d. The missing value is 25 because the product of 5 and 60 is 300 and the product of 12 and 25 is 300.

Wrapping It Up

We are going to play Equivalent Ratios. Each pair will use a deck of cards with 4 of each card. The aces in the deck represent 1. You have 4 1s, 4 2s, and so on, all the way up to 10. One person in your pair will shuffle the cards and deal 8 cards to each of you. The remaining cards will go in the middle of the table (the stock pile), with the top card turned over (the discard pile).

You will look at your cards and try to find 4 cards that will make 2 ratios that are equivalent. For example, if I had the cards 2, 4, 8, and 1, I could make the ratios 1:2 and 4:8. They are equivalent. If you cannot make matching ratios, you may take the top card from the discard pile if it helps make 2 equivalent ratios, or you can choose the top card from the stock pile. Either way, you must keep the new card and place one of your cards face up on the discard pile. You keep playing until one of you makes all of your cards into ratios. If the game ends before no player has no cards left, the player who has made the most matching ratios wins.

Warming Up:

Use any method to solve the problems. Be sure to show your work or be able to explain your reasoning.

1. Are the ratios 6:8 and 9:16 equivalent? ________

2. Are the ratios $\frac{1}{6}$ and $\frac{7}{42}$ equivalent? ________

Warming Up:

Use any method to solve the problems. Be sure to show your work or be able to explain your reasoning.

1. Are the ratios 6:8 and 9:16 equivalent? No

2. Are the ratios $\frac{1}{6}$ and $\frac{7}{42}$ equivalent? Yes

Learning to Solve:

Use cross multiplication to show that 2 ratios are equivalent. You can choose the ratios.

1. Find the missing value: $\frac{3}{4} = \frac{21}{x}$.

Write the product of 4 and 21. _________

Write the product of 3 and x. _________

Because this is a proportion, the 2 products are equal. Write the equation.

____

Find the value of x.

$x =$ _________

2. Find the missing value: $\frac{2}{3} = \frac{t}{24}$.

Write the product of 3 and t. _________

Write the product of 2 and 24. _________

Find the value of t.

$t =$ _________

Learning to Solve:

Use cross multiplication to show that 2 ratios are equivalent. You can choose the ratios.

Answers will vary, such as

$\frac{2}{3} = \frac{4}{6}$

$2 \times 6 = 3 \times 4$

$12 = 12$

1. Find the missing value: $\frac{3}{4} = \frac{21}{x}$.

Write the product of 4 and 21. 84

Write the product of 3 and x. $3x$

Because this is a proportion, the 2 products are equal. Write the equation.

$\frac{3}{4} = \frac{21}{x}$ or $3x = 84$

Find the value of x.

$x =$ 28

2. Find the missing value: $\frac{2}{3} = \frac{t}{24}$.

Write the product of 3 and t. $3t$

Write the product of 2 and 24. 48

Find the value of t.

$t =$ 16

Practicing Together

Directions:

We are going to play Prop 4. You will shuffle your cards. The first player will take a card and match it to an equivalent ratio on your board by covering it with your color counter. Then the next player takes a turn and does the same. Continue playing until someone has 4 counters in a row, up, down or diagonally. Some ratios may have more than one match and there may be some that have no match.

Trying It on Your Own

Find the missing value in the proportions.

1. Find the missing value: $\frac{14}{28} = \frac{2}{m}$.

a. The value of *m* is 56 because $2 \times 28 = 56$.

b. The value of *m* is 28 because $14 \times 2 = 28$.

c. The value of *m* is 4 because $14m = 56$, so $m = 4$.

d. The value of *m* is 2 because $14 \times m = 28$, so $m = 2$.

2. Find the missing value: $\frac{15}{u} = \frac{45}{60}$.

a. The value of *u* is 900 because 15×60 is 900.

b. The value of *u* is 855 because 60×15 is 900, subtract 45.

c. The value of *u* is 180 because $45 \times 60 = 15u$, so $u = 180$.

d. The value of *u* is 20 because $15 \times 60 = 45u$, so $u = 20$.

Trying It on Your Own

Find the missing value in the proportions.

1. Find the missing value: $\frac{14}{28} = \frac{2}{m}$.

a. The value of m is 56 because $2 \times 28 = 56$.
b. The value of m is 28 because $14 \times 2 = 28$.
c. The value of m is 4 because $14m = 56$, so $m = 4$.
d. The value of m is 2 because $14 \times m = 28$, so $m = 2$.

2. Find the missing value: $\frac{15}{u} = \frac{45}{60}$.

a. The value of u is 900 because 15×60 is 900.
b. The value of u is 855 because 60×15 is 900, subtract 45.
c. The value of u is 180 because $45 \times 60 = 15u$, so $u = 180$.
d. The value of u is 20 because $15 \times 60 = 45u$, so $u = 20$.

3. Find the missing value: $\frac{j}{9} = \frac{6}{27}$.

a. The value of *j* is 2 because $9 \times 6 = 27j$, so $j = 2$.
b. The value of *j* is 3 because 6, 9, and 27 are divisible by 3.
c. The value of *j* is 18 because $6 \times 27 = 9j$, so $j = 18$.
d. The value of *j* is 40.5 because $9 \times 27 = 6j$, so $j = 40.5$.

4. Find the missing value: $\frac{6}{11} = \frac{x}{44}$.

a. The value of *x* is 4 because 44 divided by 11 is 4.
b. The value of *x* is 24 because $11x = 264$, so $x = 24$.
c. The value of *x* is 66 because $6 \times 11 = 66$.
d. The value of *x* is 80.7 because $11 \times 44 = 6x$, so $x = 80.7$.

3. Find the missing value: $\frac{j}{9} = \frac{6}{27}$.

a. The value of j is 2 because $9 \times 6 = 27j$, so $j = 2$.
b. The value of j is 3 because 6, 9, and 27 are divisible by 3.
c. The value of j is 18 because $6 \times 27 = 9j$, so $j = 18$.
d. The value of j is 40.5 because $9 \times 27 = 6j$, so $j = 40.5$.

4. Find the missing value: $\frac{6}{11} = \frac{x}{44}$.

a. The value of x is 4 because 44 divided by 11 is 4.
b. The value of x is 24 because $11x = 264$, so $x = 24$.
c. The value of x is 66 because $6 \times 11 = 66$.
d. The value of x is 80.7 because $11 \times 44 = 6x$, so $x = 80.7$.

Wrapping It Up

Work with a partner to solve the following problems. Show your work and be able to explain it.

1. Find the missing value: $\frac{4}{9} = \frac{y}{36}$.

2. Find the missing value: $\frac{3}{x} = \frac{27}{90}$.

Wrapping It Up

Work with a partner to solve the following problems. Show your work and be able to explain it.

1. Find the missing value: $\frac{4}{9} = \frac{y}{36}$.

$y = 16$

2. Find the missing value: $\frac{3}{x} = \frac{27}{90}$.

$x = 10$

Warming Up:

Solve the problems. Show your work.

1. Find the missing value: $\frac{3}{8} = \frac{x}{32}$. $x =$ ________

2. Find the missing value: $\frac{x}{5} = \frac{12}{20}$. $x =$ ________

Warming Up:

Solve the problems. Show your work.

1. Find the missing value: $\frac{3}{8} = \frac{x}{32}$. $x =$ 12

2. Find the missing value: $\frac{x}{5} = \frac{12}{20}$. $x =$ 3

Learning to Solve:

1. If candy bars sell for 3 for $1.50, the unit rate would be _______________ .

2. If candy bars sell for 4 for $1, the unit rate would be _______________ .

3. If almonds sell for 3 pounds for $12, the unit rate would be _______________ .

A unit rate or unit ratio tells us:

____

Learning to Solve:

1. If candy bars sell for 3 for $1.50, the unit rate would be $.50:1 or $\frac{\$.50}{1}$.

2. If candy bars sell for 4 for $1, the unit rate would be $.25:1 or $\frac{\$.25}{1}$.

3. If almonds sell for 3 pounds for $12, the unit rate would be $4:1 or $\frac{\$4}{1}$.

A unit rate or unit ratio tells us:

the quantity that compares to 1 of the other quantity.

Practicing Together

With a partner, solve the following problems. Show your work, so that you can share your method with the class.

Zeke drove 120 miles in 2 hours.

1. How many miles did he drive in 1 hour? ______________________________

2. Write it as a unit rate. ______________

Sara was shopping for DVDs. She found some that were priced at 3 for $22.50.

3. How much did 1 DVD cost? ______________________________

4. Write it as a unit rate. ______________

Practicing Together

With a partner, solve the following problems. Show your work, so that you can share your method with the class.

Zeke drove 120 miles in 2 hours.

1. How many miles did he drive in 1 hour? 60 miles in 1 hour

2. Write it as a unit rate. 60:1 or $\frac{60}{1}$

Sara was shopping for DVDs. She found some that were priced at 3 for $22.50.

3. How much did 1 DVD cost? $7.50

4. Write it as a unit rate. $7.50:1 or $\frac{\$7.50}{1}$

Trying It on Your Own

Solve the problems on your own.

1. Deb wanted to buy a can of fruit cocktail. They were priced 4 cans for $3.20. What is the unit rate?

> **a.** The unit rate is $3.20:1 because a unit rate is always written with a unit. In this ratio, the unit is 1 group of 4 cans.
>
> **b.** The unit rate is $.80:1 because each can of fruit cocktail costs $.80.
>
> **c.** The unit rate is $3.20:$.80 because the whole group costs $3.20 and 1 can costs $.80.
>
> **d.** The unit rate is $3.20:4 because the whole group costs $3.20 and each unit is made up of 4 cans.

2. The Clothes-R-Us store had a sale on jeans. They were priced at 2 pairs for $25. What is the unit rate?

> **a.** The unit rate is $25:2 because that is the ratio of the total cost to the way the jeans are sold.
>
> **b.** The unit rate is $25:1 because that is the ratio of the total cost to 1 pair of jeans.
>
> **c.** The unit rate is $12.50:1 because each pair of jeans costs $12.50 at this rate.
>
> **d.** The unit rate is $25:$12.50 because each pair of jeans costs $12.50 at the rate of $25.

Trying It on Your Own

Solve the problems on your own.

1. Deb wanted to buy a can of fruit cocktail. They were priced 4 cans for $3.20. What is the unit rate?

a. The unit rate is $3.20:1 because a unit rate is always written with a unit. In this ratio, the unit is 1 group of 4 cans.

b. The unit rate is $.80:1 because each can of fruit cocktail costs $.80.

c. The unit rate is $3.20:$.80 because the whole group costs $3.20 and 1 can costs $.80.

d. The unit rate is $3.20:4 because the whole group costs $3.20 and each unit is made up of 4 cans.

2. The Clothes-R-Us store had a sale on jeans. They were priced at 2 pairs for $25. What is the unit rate?

a. The unit rate is $25:2 because that is the ratio of the total cost to the way the jeans are sold.

b. The unit rate is $25:1 because that is the ratio of the total cost to 1 pair of jeans.

c. The unit rate is $12.50:1 because each pair of jeans costs $12.50 at this rate.

d. The unit rate is $25:$12.50 because each pair of jeans costs $12.50 at the rate of $25.

3. Sam needed 10 yards of string to make 4 friendship bracelets. What is the unit rate?

a. The unit rate is 10:1 because Sam wants to make 4 friendship bracelets.

b. The unit rate is 2.25:1 because Sam will use 2.25 yards for each bracelet.

c. The unit rate is 2.50:1 because Sam will use 2.50 yards for each bracelet.

d. The unit rate is 2:5 because Sam can make 2 bracelets with 5 yards of string.

4. Jeremy was making pancakes. For 12 pancakes, the recipe required 2 cups of flour. He wanted to make 6 pancakes. How much flour will he need?

a. He will need 4 cups of flour because 12 is twice as much as 6.

b. He will need 2 cups of flour because 6 times 2 is 12.

c. He will need 1 cup of flour because 12:2 is equivalent to 6:1.

d. He will need $\frac{1}{2}$ cup of flour because 6 is half of 12.

3. Sam needed 10 yards of string to make 4 friendship bracelets. What is the unit rate?

a. The unit rate is 10:1 because Sam wants to make 4 friendship bracelets.

b. The unit rate is 2.25:1 because Sam will use 2.25 yards for each bracelet.

c. The unit rate is 2.50:1 because Sam will use 2.50 yards for each bracelet.

d. The unit rate is 2:5 because Sam can make 2 bracelets with 5 yards of string.

4. Jeremy was making pancakes. For 12 pancakes, the recipe required 2 cups of flour. He wanted to make 6 pancakes. How much flour will he need?

a. He will need 4 cups of flour because 12 is twice as much as 6.

b. He will need 2 cups of flour because 6 times 2 is 12.

c. He will need 1 cup of flour because 12:2 is equivalent to 6:1.

d. He will need $\frac{1}{2}$ cup of flour because 6 is half of 12.

Wrapping It Up

Which is a better buy: 3 apples for \$0.99 or 4 apples for \$1.20? Why?

Wrapping It Up

Which is a better buy: 3 apples for $0.99 or 4 apples for $1.20? Why?

4 apples for $1.20 because each apple would cost $.30; at the other price, each apple would cost $.33 or a unit rate of $.33:1.

Warming Up:

Find the missing values, using any method you prefer. Show your work.

1. $\frac{5}{x} = \frac{30}{72}$ $x =$ ________

2. $\frac{x}{11} = \frac{8}{88}$ $x =$ ________

3. $\frac{25}{100} = \frac{x}{1{,}000}$ $x =$ ________

Warming Up:

Find the missing values, using any method you prefer. Show your work.

1. $\frac{5}{x} = \frac{30}{72}$ $x =$ 12

2. $\frac{x}{11} = \frac{8}{88}$ $x =$ 1

3. $\frac{25}{100} = \frac{x}{1{,}000}$ $x =$ 250

Learning to Solve:

Directions:

Now you are going to play, Create the Rate. First, decide who will be Player A and who will be Player B. We will use a regular deck of cards, but you need to remove all of the face cards. The deck contains the 2 through 10 cards. The 10 card represents 0 and the ace represents 1. There are four of each number in the deck. When you are finished removing the face cards, shuffle the deck.

Look at the Version 1 directions and find your Create the Rate Game Sheet, Version 1 in your Student Booklet; follow along as I read the directions to you. As I read each step of the game, follow the directions and write your answers on Round 1 of your Player A or Player B game sheet. When we're done, you will do the remaining rounds on your own and sum and record your Total Scores to determine who has more points.

1. Shuffle the cards and spread them out face down on the desk.

2. Each player draws 3 cards.

3. Each player arranges the cards in an order to create the largest unit ratio.

4. Each player writes their card arrangement on the Create the Rate Game Sheet and then uses the calculator to determine the unit rate (if necessary).

5. The player with the largest unit ratio receives 1 point. He or she circles "1" for the score for that round.

6. Play the next four rounds using 3 cards.

7. Calculate the Total Score. The player with the most points wins.

8. If time permits, play another 5 rounds, this time with 4 cards and using the Version 2, Create the Rate Sheets I will pass out.

9. Calculate the Total Score. The player with the most points wins.

Create the Rate Game Sheet

Version 1: Player A

Round 1

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	______ ______ : ______	0	1

Round 2

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	______ ______ : ______	0	1

Round 3

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	______ ______ : ______	0	1

Round 4

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	______ ______ : ______	0	1

Round 5

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	______ ______ : ______	0	1

Total Score: ______

Create the Rate Game Sheet

Version 1: Player B

Round 1

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	______ ______ : ______	0 1

Round 2

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	______ ______ : ______	0 1

Round 3

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	______ ______ : ______	0 1

Round 4

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	______ ______ : ______	0 1

Round 5

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	______ ______ : ______	0 1

Total Score: ______

Create the Rate Game Sheet

Version 2: Player A

Round 1

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	______ ______ : ______	0 1

Round 2

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	______ ______ : ______	0 1

Round 3

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	______ ______ : ______	0 1

Round 4

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	______ ______ : ______	0 1

Round 5

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	______ ______ : ______	0 1

Total Score: ______

Create the Rate Game Sheet

Version 2: Player B

Round 1

Cards: ___ ___ : ___ ___

Unit Rate: ______ ______ : ______

Circle Score: 0 1

Round 2

Cards: ___ ___ : ___ ___

Unit Rate: ______ ______ : ______

Circle Score: 0 1

Round 3

Cards: ___ ___ : ___ ___

Unit Rate: ______ ______ : ______

Circle Score: 0 1

Round 4

Cards: ___ ___ : ___ ___

Unit Rate: ______ ______ : ______

Circle Score: 0 1

Round 5

Cards: ___ ___ : ___ ___

Unit Rate: ______ ______ : ______

Circle Score: 0 1

Total Score: ______

Trying It on Your Own

Solve the problems on your own.

1. The unit rate for the number of angles in a decagon is 10:1. What is the number of angles in 110 decagons?

- **a.** 101 angles
- **b.** 110 angles
- **c.** 1,010 angles
- **d.** 1,100 angles

2. Della is making a pizza. The recipe she is using is for 3 pizzas. It says that she needs 54 pepperoni slices. Find the unit rate that shows the number of pepperoni slices she needs for 1 pizza.

- **a.** 162:1
- **b.** 51:1
- **c.** 24:1
- **d.** 18:1

Trying It on Your Own

Solve the problems on your own.

1. The unit rate for the number of angles in a decagon is 10:1. What is the number of angles in 110 decagons?

- **a.** 101 angles
- **b.** 110 angles
- **c.** 1,010 angles
- **d.** 1,100 angles

2. Della is making a pizza. The recipe she is using is for 3 pizzas. It says that she needs 54 pepperoni slices. Find the unit rate that shows the number of pepperoni slices she needs for 1 pizza.

- **a.** 162:1
- **b.** 51:1
- **c.** 24:1
- **d.** 18:1

Use this information about Tripp's shopping trip to solve problems 3 and 4.

Tripp was shopping for new clothes. He found a sale on jeans and shirts. The jeans were $44.25 for 3 pairs. The shirts were $37.50 for 3 shirts.

3. What is the cost of 1 pair of jeans?

- **a.** $12
- **b.** $14.75
- **c.** $15
- **d.** $41.25

4. How much would 2 shirts cost?

- **a.** $12.50
- **b.** $25
- **c.** $29.50
- **d.** $37.50

Use this information about Tripp's shopping trip to solve problems 3 and 4.

Tripp was shopping for new clothes. He found a sale on jeans and shirts. The jeans were $44.25 for 3 pairs. The shirts were $37.50 for 3 shirts.

3. What is the cost of 1 pair of jeans?

a. $12
b. $14.75
c. $15
d. $41.25

4. How much would 2 shirts cost?

a. $12.50
b. $25
c. $29.50
d. $37.50

Wrapping It Up

Turn to the Notes page in your Student Booklet. Write 1 new idea you have learned about ratios in this module.

Wrapping It Up

Turn to the Notes page in your Student Booklet. Write 1 new idea you have learned about ratios in this module.

Answers will vary.

Warming Up:

We are going to play a game called You Say, I Say. I will call on some of you to give me a number. I will put it in the You Say column of the table. Then, I have a rule in my mind that I am going to use on your number. I will record the result in the I Say column. When you think you know the rule, raise your hand but don't say the rule out loud. As we keep going, when you are sure you know the rule, write the rule in the I Say column.

Rules that you can use (You Say number is x, the result is the I Say number):

1. $2x + 1$

2. $3x - 2$

3. $4x$

4. $2x + 5$

5. $3x + 2$

6. $(x + 1) \div 2$

7. $x + 6$

8. $3x + 1$

9. $3x$

10. $2x + 10$

Learning to Solve:

1. Mona made a table to show equivalent ratios. Complete the table, using the same relationship.

Number of Triangles	Number of Angles
1	3
2	6
3	
4	
7	
	30

2. How would you describe the relationship between the number of triangles and the number of angles?

3. What ratio could you write to show the relationship you described?

Learning to Solve:

1. Mona made a table to show equivalent ratios. Complete the table, using the same relationship.

Number of Triangles	Number of Angles
1	3
2	6
3	9
4	12
7	21
10	30

2. How would you describe the relationship between the number of triangles and the number of angles?

Possible relationships:
As the number of triangles increases by 1, the number of angles increases by 3.
As the number of angles increases by 3, the number of triangles increases by 1.
For every 1 triangle, there are 3 angles.
For every 3 angles, there is 1 triangle.

Other relationships are possible.

3. What ratio could you write to show the relationship you described?

Multiple answers are possible. For example, 1:3; 3:1; 3:9, and so on.

Practicing Together

Work with a partner to complete the table.

Jesse made a table to show equivalent ratios of the number of cups of orange juice to the number of cups of cranberry juice in his fruit punch.

1. Complete the table, using the same relationship.

Number of cups of orange juice	Number of cups of cranberry juice
2	4
3	6
5	
	14
8	
	22
100	
	1
$\frac{3}{2}$	

2. What is the unit rate that shows the number of cups of cranberry juice for every cup of orange juice? ______________

Practicing Together

Work with a partner to complete the table.

Jesse made a table to show equivalent ratios of the number of cups of orange juice to the number of cups of cranberry juice in his fruit punch.

1. Complete the table, using the same relationship.

Number of cups of orange juice	Number of cups of cranberry juice
2	4
3	6
5	10
7	14
8	16
11	22
100	200
$\frac{1}{2}$	1
$\frac{3}{2}$	3

2. What is the unit rate that shows the number of cups of cranberry juice for every cup of orange juice? 2:1

3. How would you describe the relationship between the number of cups of orange juice and the number of cups of cranberry juice?

3. How would you describe the relationship between the number of cups of orange juice and the number of cups of cranberry juice?

Multiple answers are possible, such as the following:
As the number of cups of orange juice increases by 1, the number of cups of cranberry increases by 2.
As the number of cups of cranberry juice increases by 2, the number of cups of orange juice increases by 1.
For every 1 cup of orange juice, there are 2 cups of cranberry juice.
For every 2 cups of cranberry juice, there is 1 cup of orange juice.

Other relationships are possible.

Trying It on Your Own

Use the table to answer the questions.

Number of pounds of almonds	Number of pounds of yogurt-covered raisins
2	1
3	1.5
4	2
10	5
7	
	$\frac{1}{2}$
$\frac{3}{4}$	

1. If Melissa used 7 pounds of almonds, how many pounds of yogurt-covered raisins would she need?

a. She would need 3 pounds of yogurt-covered raisins.

b. She would need $3\frac{1}{2}$ pounds of yogurt-covered raisins.

c. She would need 10 pounds of yogurt-covered raisins.

d. She would need 14 pounds of yogurt-covered raisins.

Trying It on Your Own

Melissa made a snack mix with almonds and yogurt-covered raisins. She made a table to show the amounts she would need if she wanted to make different quantities.

Use the table to answer the questions.

Number of pounds of almonds	Number of pounds of yogurt-covered raisins
2	1
3	1.5
4	2
10	5
7	
	$\frac{1}{2}$
$\frac{3}{4}$	

1. If Melissa used 7 pounds of almonds, how many pounds of yogurt-covered raisins would she need?

a. She would need 3 pounds of yogurt-covered raisins.

b. She would need 3 $\frac{1}{2}$ pounds of yogurt-covered raisins.

c. She would need 10 pounds of yogurt-covered raisins.

d. She would need 14 pounds of yogurt-covered raisins.

2. If Melissa used $\frac{1}{2}$ pound of yogurt-covered raisins, how many pounds of almonds would she need?

a. She would need 2 pounds of almonds.

b. She would need 1 pound of almonds.

c. She would need $\frac{1}{2}$ pound of almonds.

d. She would need $\frac{1}{4}$ pound of almonds.

3. If Melissa used $\frac{3}{4}$ pound of almonds, how many pounds of yogurt-covered raisins would she need?

a. She would need $\frac{11}{2}$ pounds of yogurt-covered raisins.

b. She would need 1 pound of yogurt-covered raisins.

c. She would need $\frac{3}{8}$ pound of yogurt-covered raisins.

d. She would need $\frac{1}{4}$ pound of yogurt-covered raisins.

2. If Melissa used $\frac{1}{2}$ pound of yogurt-covered raisins, how many pounds of almonds would she need?

a. She would need 2 pounds of almonds.

b. She would need 1 pound of almonds.

c. She would need $\frac{1}{2}$ pound of almonds.

d. She would need $\frac{1}{4}$ pound of almonds.

3. If Melissa used $\frac{3}{4}$ pound of almonds, how many pounds of yogurt-covered raisins would she need?

a. She would need $\frac{11}{2}$ pounds of yogurt-covered raisins.

b. She would need 1 pound of yogurt-covered raisins.

c. She would need $\frac{3}{8}$ pound of yogurt-covered raisins.

d. She would need $\frac{1}{4}$ pound of yogurt-covered raisins.

4. How would you describe the relationship between the number of pounds of almonds and the number of pounds of yogurt-covered raisins?

a. As the number of pounds of almonds increases by 1, the number of pounds of yogurt-covered raisins increases by $\frac{1}{2}$.

b. As the number of pounds of yogurt-covered raisins increases by 1, the number of pounds of almonds increases by 1.

c. As the number of pounds of almonds increases by 2, the number of pounds of yogurt-covered raisins increases by 2.

d. As the number of pounds of yogurt-covered raisins increases by 2, the number of pounds of almonds increases by 1.

4. How would you describe the relationship between the number of pounds of almonds and the number of pounds of yogurt-covered raisins?

a. As the number of pounds of almonds increases by 1, the number of pounds of yogurt-covered raisins increases by $\frac{1}{2}$.

b. As the number of pounds of yogurt-covered raisins increases by 1, the number of pounds of almonds increases by 1.

c. As the number of pounds of almonds increases by 2, the number of pounds of yogurt-covered raisins increases by 2.

d. As the number of pounds of yogurt-covered raisins increases by 2, the number of pounds of almonds increases by 1.

Wrapping It Up

Find the unit rates.

1. Carrots are priced at $4.25 for 5 pounds. Write the unit rate of the cost per pound.

____

2. Jelly beans are priced at $3.45 for 3 pounds. Write the unit rate of the cost per pound.

____

Wrapping It Up

Find the unit rates.

1. Carrots are priced at $4.25 for 5 pounds. Write the unit rate of the cost per pound.

$.85:1

2. Jelly beans are priced at $3.45 for 3 pounds. Write the unit rate of the cost per pound.

$1.15:1

Warming Up:

We are going to play Ratio Round-Up. In your pair, you will sort the cards under the mat heading that is the correct unit rate for your ratios.

Learning to Solve:

Create a table that shows equivalent ratios for the relationship of 4 cups of granola for every 2 cups of banana chips.

Number of cups of granola	Number of cups of banana chips

Write the unit rate that shows the number of cups of banana chips for every cup of granola.

Learning to Solve:

Create a table that shows equivalent ratios for the relationship of 4 cups of granola for every 2 cups of banana chips.

Answers will vary in the table, such as:

Number of cups of granola	Number of cups of banana chips
4	2
8	4

Write the unit rate that shows the number of cups of banana chips for every cup of granola.

0.5:1, or $\frac{1}{2}$:1

Practicing Together

1. Create a table to show equivalent ratios for the relationship described below.

Courtney and Paul were making chocolate milk. For every cup of milk, they added 3 tablespoons of chocolate syrup.

Number of cups of milk	Number of tablespoons of chocolate syrup

2. Write the unit rate that shows the number of tablespoons of chocolate syrup for every cup of milk. ________________

3. What if Courtney used $\frac{1}{3}$ cup of milk? How many tablespoons of chocolate syrup would she need? ________________

Practicing Together

1. Create a table to show equivalent ratios for the relationship described below.

Courtney and Paul were making chocolate milk. For every cup of milk, they added 3 tablespoons of chocolate syrup.

Answers will vary in the table, such as:

Number of cups of milk	Number of tablespoons of chocolate syrup
1	3
2	6

2. Write the unit rate that shows the number of tablespoons of chocolate syrup for every cup of milk. 3:1

3. What if Courtney used $\frac{1}{3}$ cup of milk? How many tablespoons of chocolate syrup would she need? 1 tablespoon

4. Courtney used $12\frac{1}{2}$ tablespoons of chocolate syrup and 3 cups of milk. Paul said this was not the same rate that they had been using. Who do you agree with?

a. I agree with Courtney because $12 = 4 \times 3$

b. I agree with Courtney because the ratio is 3:1.

c. I agree with Paul because Courtney should have used more milk to keep the same ratio.

d. I agree with Paul because Courtney should have used less milk to keep the same ratio.

4. Courtney used $12\frac{1}{2}$ tablespoons of chocolate syrup and 3 cups of milk. Paul said this was not the same rate that they had been using. Who do you agree with?

a. I agree with Courtney because $12 = 4 \times 3$

b. I agree with Courtney because the ratio is 3:1.

c. I agree with Paul because Courtney should have used more milk to keep the same ratio.

d. I agree with Paul because Courtney should have used less milk to keep the same ratio.

Trying It on Your Own

Solve the problems on your own.

Samantha and Gary were making a fruit salad. For every apple they used in the salad, they used 3 oranges.

1. Which table shows this relationship?

a.

Number of apples	Number of oranges
3	1
6	2
9	3
12	4

b.

Number of apples	Number of oranges
1	$\frac{1}{3}$
2	$\frac{2}{3}$
3	1
4	$\frac{4}{3}$

c.

Number of apples	Number of oranges
3	1
4	2
5	3
6	4

d.

Number of apples	Number of oranges
1	3
2	6
3	9
4	12

Trying It on Your Own

Solve the problems on your own.

Samantha and Gary were making a fruit salad. For every apple they used in the salad, they used 3 oranges.

1. Which table shows this relationship?

a.

Number of apples	Number of oranges
3	1
6	2
9	3
12	4

b.

Number of apples	Number of oranges
1	$\frac{1}{3}$
2	$\frac{2}{3}$
3	1
4	$\frac{4}{3}$

c.

Number of apples	Number of oranges
3	1
4	2
5	3
6	4

d.

Number of apples	Number of oranges
1	3
2	6
3	9
4	12

2. Gary used $10\frac{1}{2}$ apples and 30 oranges. Samantha said, "That's not the right ratio of apples to oranges." Do you think Samantha is correct?

- **a.** I do not agree with Samantha. The ratio of 10:30 is the same as the ratio of 1:3.
- **b.** I do not agree with Samantha. The unit ratio is 3:1.
- **c.** I agree with Samantha. Gary should have used more than 30 oranges to keep the ratio at 1:3.
- **d.** I agree with Samantha. Gary should have used fewer than 30 oranges to keep the ratio at 1:3.

3. Samantha had 36 oranges to use in the salad. How many apples should she use?

- **a.** 108 apples
- **b.** 39 apples
- **c.** 12 apples
- **d.** 3 apples

2. Gary used $10\frac{1}{2}$ apples and 30 oranges. Samantha said, "That's not the right ratio of apples to oranges." Do you think Samantha is correct?

- **a.** I do not agree with Samantha. The ratio of 10:30 is the same as the ratio of 1:3.
- **b.** I do not agree with Samantha. The unit ratio is 3:1.
- **c.** I agree with Samantha. Gary should have used more than 30 oranges to keep the ratio at 1:3.
- **d.** I agree with Samantha. Gary should have used fewer than 30 oranges to keep the ratio at 1:3.

3. Samantha had 36 oranges to use in the salad. How many apples should she use?

- **a.** 108 apples
- **b.** 39 apples
- **c.** 12 apples
- **d.** 3 apples

4. Which of the following proportions would help Gary determine the number of apples he needs when he uses 72 oranges?

a. $\frac{1}{3} = \frac{72}{x}$

b. $\frac{72}{3} = \frac{1}{x}$

c. $\frac{3}{1} = \frac{x}{72}$

d. $\frac{1}{3} = \frac{x}{72}$

4. Which of the following proportions would help Gary determine the number of apples he needs when he uses 72 oranges?

a. $\frac{1}{3} = \frac{72}{x}$

b. $\frac{72}{3} = \frac{1}{x}$

c. $\frac{3}{1} = \frac{x}{72}$

d. $\frac{1}{3} = \frac{x}{72}$

Wrapping It Up

Find the missing values.

1. $\frac{x}{8} = \frac{10}{2}$ $x =$ ________

2. $\frac{4}{7} = \frac{20}{x}$ $x =$ ________

3. $\frac{12}{40} = \frac{x}{10}$ $x =$ ________

Wrapping It Up

Find the missing values.

1. $\frac{x}{8} = \frac{10}{2}$ $x =$ 40

2. $\frac{4}{7} = \frac{20}{x}$ $x =$ 35

3. $\frac{12}{40} = \frac{x}{10}$ $x =$ 3

Warming Up:

Directions:

We are going to play Match the Unit Rate. There are cards with ratios on them. I will call out a unit rate; if you have a card with a ratio that matches the unit rate, stand up and share the ratio. For example, if the unit rate is 9 and you have a ratio 9 to 1 or 18 to 2, stand up, show the card, and state the ratio.

Learning to Solve:

Brent and Tim each made a table to show the ratio of the number of cups of banana chips to the number of cups of carob chips used to make a trail mix.

Brent's Table	
Number of cups of banana chips	**Number of cups of carob chips**
5	2
7.5	3
15	6
25	10

Tim's Table	
Number of cups of banana chips	**Number of cups of carob chips**
5	2
10	4
20	8
27.5	11

1. What is the unit rate of the number of cups of banana chips for every cup of carob chips in Brent's table? _______________

2. Do Brent's table and Tim's table represent the same ratio? Yes No

3. Explain your answer in number 2. How did you decide?

4. If Tim used 20 cups of banana chips, how many cups of carob chips would he need?

____

5. If Brent used 20 cups of carob chips, how many cups of banana chips would he need?

____

1. What is the unit rate of the number of cups of banana chips for every cup of carob chips in Brent's table? 2.5:1

2. Do Brent's table and Tim's table represent the same ratio? Yes No

3. Explain your answer in number 2. How did you decide?
Answers will vary, such as used the unit rate to decide.

4. If Tim used 20 cups of banana chips, how many cups of carob chips would he need?
8 cups

5. If Brent used 20 cups of carob chips, how many cups of banana chips would he need?
50 cups

6. Sarah made a trail mix with banana and carob chips, too. For every 20 cups of banana chips, she uses 8 cups of carob chips. Does her mix have the same ratio as Brent and Tim's mix?

a. Yes, because she is using the same ingredients.

b. Yes, because the unit rate is 2.5:1.

c. No, because she needs to use fewer than 8 cups of carob chips to have the same unit rate.

d. No, because she needs to use more than 8 cups of carob chips to have the same unit rate.

6. Sarah made a trail mix with banana and carob chips, too. For every 20 cups of banana chips, she uses 8 cups of carob chips. Does her mix have the same ratio as Brent and Tim's mix?

a. Yes, because she is using the same ingredients.

b. Yes, because the unit rate is 2.5:1.

c. No, because she needs to use fewer than 8 cups of carob chips to have the same unit rate.

d. No, because she needs to use more than 8 cups of carob chips to have the same unit rate.

Trying It on Your Own

Use the tables to solve problems 1–4.

Fred and Ted each made a table to show the ratio of the number of cups of milk to the number of tablespoons of strawberry syrup to make strawberry milk.

Fred's Table	
Number of cups of milk	**Number of tablespoons of strawberry syrup**
2	3
3	4.5
5	7.5
10	15

Ted's Table	
Number of cups of milk	**Number of tablespoons of strawberry syrup**
1	1.5
4	6
6	9
12	18

1. Do Fred's table and Ted's table represent the same ratio?

a. Yes, they represent the same ratio because they both have a unit rate of 1.5:1 of the number of tablespoons of syrup to cups of milk.

b. Yes, they represent the same ratio because they both have a unit rate of 3:1 of the number of tablespoons of syrup to cups of milk.

c. No, they do not represent the same ratio because Fred's table has decimals in it.

d. No, they do not represent the same ratio because in Ted's table, the number of cups of milk does not increase by the same amount in each row.

2. If Ted used 20 cups of milk, how many tablespoons of strawberry syrup would he need?

a. He will need 12 tablespoons.

b. He will need 28 tablespoons.

c. He will need 30 tablespoons.

d. He will need 40 tablespoons.

1. Do Fred's table and Ted's table represent the same ratio?

a. Yes, they represent the same ratio because they both have a unit rate of 1.5:1 of the number of tablespoons of syrup to cups of milk.

b. Yes, they represent the same ratio because they both have a unit rate of 3:1 of the number of tablespoons of syrup to cups of milk.

c. No, they do not represent the same ratio because Fred's table has decimals in it.

d. No, they do not represent the same ratio because in Ted's table, the number of cups of milk does not increase by the same amount in each row.

2. If Ted used 20 cups of milk, how many tablespoons of strawberry syrup would he need?

a. He will need 12 tablespoons.

b. He will need 28 tablespoons.

c. He will need 30 tablespoons.

d. He will need 40 tablespoons.

3. If Fred used 60 tablespoons of strawberry syrup, how many cups of milk would he need?

a. He will need 30 cups of milk.

b. He will need 40 cups of milk.

c. He will need 75 cups of milk.

d. He will need 90 cups of milk.

4. Sarah made a different mixture of strawberry syrup and milk. She used 5 tablespoons of strawberry syrup for every 3 cups of milk. Would her mixture have more strawberry flavor than Fred's strawberry milk?

a. No, Fred's milk would have more strawberry flavor because the unit rate for Sarah is .80:1, or for every cup of milk, there is $\frac{3}{5}$ tablespoon of syrup.

b. No, because the unit rate for Fred's milk and Sarah's milk is the same.

c. Yes, Sarah's milk would have more strawberry flavor because she is using 5 cups of milk.

d. Yes, Sarah's milk would have more strawberry flavor because her unit rate of syrup to 1 cup of milk is $\frac{5}{3}$: 1 or 1 $\frac{2}{3}$: 1. So for every cup of milk, there is $\frac{3}{5}$ tablespoon of syrup.

3. If Fred used 60 tablespoons of strawberry syrup, how many cups of milk would he need?

a. He will need 30 cups of milk.
b. He will need 40 cups of milk.
c. He will need 75 cups of milk.
d. He will need 90 cups of milk.

4. Sarah made a different mixture of strawberry syrup and milk. She used 5 tablespoons of strawberry syrup for every 3 cups of milk. Would her mixture have more strawberry flavor than Fred's strawberry milk?

a. No, Fred's milk would have more strawberry flavor because the unit rate for Sarah is .80:1, or for every cup of milk, there is $\frac{3}{5}$ tablespoon of syrup.

b. No, because the unit rate for Fred's milk and Sarah's milk is the same.

c. Yes, Sarah's milk would have more strawberry flavor because she is using 5 cups of milk.

d. Yes, Sarah's milk would have more strawberry flavor because her unit rate of syrup to 1 cup of milk is $\frac{5}{3}$: 1 or 1 $\frac{2}{3}$: 1. So for every cup of milk, there is $\frac{5}{3}$ tablespoon of syrup.

Wrapping It Up

Find the missing values.

1. $\frac{3}{2} = \frac{x}{1}$ $x =$ ________

2. $\frac{8}{14} = \frac{24}{x}$ $x =$ ________

3. $\frac{5}{2} = \frac{x}{10}$ $x =$ ________

Wrapping It Up

Find the missing values.

1. $\frac{3}{2} = \frac{x}{1}$ $x =$ 1.5 or $1\frac{1}{2}$ or $\frac{3}{2}$

2. $\frac{8}{14} = \frac{24}{x}$ $x =$ 42

3. $\frac{5}{2} = \frac{x}{10}$ $x =$ 25

Warming Up:

Directions:

We are going to play Reba's Rectangle. You will solve Reba's Rectangle as a 4-person team. Each of you should have 1 card. You will take turns reading your card to your group. Your group must decide how to color in the blocks on your grid sheet so that your final product matches all the clues. Be sure that you read all the clues first before you start coloring your grid. Once you find a solution, decide if there are other solutions.

Learning to Solve:

Example 1:

As the number of dogs increases by 1, the number of legs increases by 4.

Ratio of the number of dogs to the number of legs ______________________

The number of __________________ depends on the number of __________________.

Independent variable _________________________________

Dependent variable _________________________________

Example 2:

As the number of triangles increases by 1, the number of angles increases by 3.

The number of __________________ depends on the number of __________________.

Independent variable _________________________________

Dependent variable _________________________________

Example 3:

The independent variable is the number of pentagons. The dependent variable is the number of sides.

Write a statement that describes this relationship:

As the number of __________________ increases by 1, the number of

__________________ increases by ___________.

Learning to Solve:

Example 1:

As the number of dogs increases by 1, the number of legs increases by 4.

Ratio of the number of dogs to the number of legs 1:4 or any equivalent ratio

The number of legs depends on the number of dogs.

Independent variable Number of dogs

Dependent variable Number of legs

Example 2:

As the number of triangles increases by 1, the number of angles increases by 3.

The number of angles depends on the number of triangles.

Independent variable Number of triangles

Dependent variable Number of angles

Example 3:

The independent variable is the number of pentagons. The dependent variable is the number of sides.

Write a statement that describes this relationship:

As the number of pentagons increases by 1, the number of sides increases by 5.

Practicing Together

Work with a partner. Decide which is the dependent variable and which is the independent variable.

1. As the number of lemons increases by 1, the number of cups of sugar increases by 3.

Independent variable ______________________________

Dependent variable ______________________________

2. The number of heads increases by 1 as the number of pigs increases by 1.

Independent variable ______________________________

Dependent variable ______________________________

3. The distance traveled increases by 30 miles as the time increases by 1 hour.

Independent variable ______________________________

Dependent variable ______________________________

Practicing Together

Work with a partner. Decide which is the dependent variable and which is the independent variable.

1. As the number of lemons increases by 1, the number of cups of sugar increases by 3.

Independent variable Number of lemons

Dependent variable Number of cups of sugar

2. The number of heads increases by 1, as the number of pigs increases by 1.

Independent variable Number of pigs

Dependent variable Number of heads

3. The distance traveled increases by 30 miles as the time increases by 1 hour.

Independent variable Number of hours

Dependent variable Number of miles traveled

Trying It on Your Own

Solve the problems on your own.

1. The number of tails increases by 1 as the number of cows increases by 1. Which gives the dependent and independent variables?

a. The independent variable is the number of cows, the dependent variable is the number of tails.

b. The independent variable is the number of tails, the dependent variable is the number of cows.

c. The independent variable is the number of cows, the dependent variable is 1.

d. The independent and dependent variables are the same, because the ratio is 1:1.

2. Carl said, "The faster I drive, the more gallons of gas I use in my car." Which gives the independent and dependent variables?

a. The independent variable is the kind of car Carl drives, the dependent variable is the kind of gas he uses.

b. The independent variable is speed that Carl drives, the dependent variable is the octane of the gas he uses.

c. The independent variable is the size of Carl's gas tank, the dependent variable is the amount of gas he uses.

d. The independent variable is the speed that Carl drives, the dependent variable is the amount of gas he uses.

Trying It on Your Own

Solve the problems on your own.

1. The number of tails increases by 1 as the number of cows increases by 1. Which gives the dependent and independent variables?

- **a.** The independent variable is the number of cows; the dependent variable is the number of tails.
- **b.** The independent variable is the number of tails; the dependent variable is the number of cows.
- **c.** The independent variable is the number of cows; the dependent variable is 1.
- **d.** The independent and dependent variables are the same because the ratio is 1:1.

2. Carl said, "The faster I drive, the more gallons of gas I use in my car." Which gives the independent and dependent variables?

- **a.** The independent variable is the kind of car Carl drives; the dependent variable is the kind of gas he uses.
- **b.** The independent variable is speed that Carl drives; the dependent variable is the octane of the gas he uses.
- **c.** The independent variable is the size of Carl's gas tank; the dependent variable is the amount of gas he uses.
- **d.** The independent variable is the speed that Carl drives; the dependent variable is the amount of gas he uses.

3. Tori downloads music from a website for $0.99 per song. The more music she downloads, the more money she spends. Which identifies the dependent and independent variables?

a. The independent variable is the website Tori uses; the dependent variable is the kind of music she downloads.

b. The independent variable is the kind of music she downloads; the dependent variable is the cost of each song.

c. The independent variable is the number of songs she downloads; the dependent variable is the amount of money she spends on songs.

d. The independent variable is the cost of each song ($0.99); the dependent variable is the number of songs she downloads.

4. Cameron's dad is building a trophy case for his trophies. The number of trophies will determine the number of shelves that he will build. Which identifies the dependent and independent variables?

a. The independent variable is the number of shelves; the dependent variable is the number of trophies.

b. The independent variable is the length of a shelf; the dependent variable is the number of trophies that will fit on a shelf.

c. The independent variable is the number of trophies; the dependent variable is the number of shelves.

d. The independent variable is the height of the trophies; the dependent variable is the number of shelves.

3. Tori downloads music from a website for $0.99 per song. The more music she downloads, the more money she spends. Which identifies the dependent and independent variables?

a. The independent variable is the website Tori uses; the dependent variable is the kind of music she downloads.

b. The independent variable is the kind of music she downloads; the dependent variable is the cost of each song.

c. The independent variable is the number of songs she downloads; the dependent variable is the amount of money she spends on songs.

d. The independent variable is the cost of each song ($0.99); the dependent variable is the number of songs she downloads.

4. Cameron's dad is building a trophy case for his trophies. The number of trophies will determine the number of shelves that he will build. Which identifies the dependent and independent variables?

a. The independent variable is the number of shelves; the dependent variable is the number of trophies.

b. The independent variable is the length of a shelf; the dependent variable is the number of trophies that will fit on a shelf.

c. The independent variable is the number of trophies; the dependent variable is the number of shelves.

d. The independent variable is the height of the trophies; the dependent variable is the number of shelves.

Wrapping It Up

Write the unit rate.

1. For every 6 cups of granola, Evie used 3 cups of coconut. ________________

2. For every 6 cups of granola, Evie used 4 cups of coconut. ________________

3. For every 10 cups of granola, Evie used 2 cups of coconut. ________________

Wrapping It Up

Write the unit rate.

1. For every 6 cups of granola, Evie used 3 cups of coconut. 2:1

2. For every 6 cups of granola, Evie used 4 cups of coconut. 1.5:1

3. For every 10 cups of granola, Evie used 2 cups of coconut. 5:1

Warming Up:

We are going to play a game called You Say, I Say. I will call on some of you to give me a number. I will put it in the You Say column of the table. Then, I have a rule in my mind that I am going to use on your number. I will record the result in the I Say column. When you think you know the rule, raise your hand but don't say the rule out loud. As we keep going, when you are sure you know the rule, write the rule in the I Say column.

Rules that you can use (You Say number is x, the result is the I Say number):

1. $2x + 1$

2. $3x - 2$

3. $4x$

4. $2x + 5$

5. $3x + 2$

6. $(x + 1) \div 2$

7. $x + 6$

8. $3x + 1$

9. $3x$

10. $2x + 10$

Learning to Solve:

1. Write a description of how you think about an independent variable.

2. Write a description of how you think about a dependent variable.

3. Give an example of a situation that shows a dependent and an independent variable.

4. The sixth-grade class sponsored a movie to make money for a class trip. They charged $3.25 per person to watch the movie.

Describe the relationship found in this example.

Independent variable ____________________________________

Dependent variable ____________________________________

Learning to Solve:

1. Write a description of how you think about an independent variable.

Answers will vary, such as, I remember that the independent variable's quantity affects the independent variable's quantity.

2. Write a description of how you think about a dependent variable.

Answers will vary,such as, Just like above, the variable that depends on another variable is the dependent variable.

3. Give an example of a situation that shows a dependent and an independent variable.

Answers will vary, such as, the amount of money I spend on 3 shirts depends on the cost of each shirt.

4. The sixth-grade class sponsored a movie to make money for a class trip. They charged \$3.25 per person to watch the movie.

Describe the relationship found in this example.

Answers will vary. Example: As the number of people attending the movie increases by 1, the total amount earned by the sixth-grade class increases by \$3.25.

Independent variable Number of people attending the movie

Dependent variable Total amount of money made by the class

Practicing Together

Work with a partner to find the relationships and name the dependent and independent variables.

1. Jackson is selling lemonade. He sells each cup for $1.25.

Describe the relationship.

Independent variable ______________________________

Dependent variable ______________________________

2. Cameron works at a bicycle shop. He makes $6.50 per hour.

Describe the relationship.

Independent variable ______________________________

Dependent variable ______________________________

Practicing Together

Work with a partner to find the relationships and name the dependent and independent variables.

1. Jackson is selling lemonade. He sells each cup for $1.25.

Describe the relationship.

Answers will vary. For example, as the number of minutes increases by 1, the number of pages read increases by 0.5. Jackson needs 2 minutes to read 1 page.

Independent variable Number of cups of lemonade sold

Dependent variable Number of pages read

2. Cameron works at a bicycle shop. He makes $6.50 per hour.

Describe the relationship.

For every hour he works, the amount of money he earns increases by $6.50.

Independent variable Number of hours worked

Dependent variable Amount of money earned

3. Kara buys juices to take to a party. Each juice costs $1.75.

Describe the relationship.

Independent variable ______________________________

Dependent variable ______________________________

3. Kara buys juices to take to a party. Each juice costs $1.75.

Describe the relationship.

Answers will vary, such as, for every juice bought, the total amount spent increases by $1.75.

Independent variable Number of juices bought

Dependent variable Amount of money spent

Trying It on Your Own

Solve the problems on your own.

1. Jeremy realized that the more he watered a plant, the more it grew. What are the dependent and independent variables?

> **a.** The independent variable is the height of the plant; the dependent variable is the amount of water.
>
> **b.** The independent variable is the amount of water the plant needs; the dependent variable is the type of plant.
>
> **c.** The independent variable is the amount of sunlight; the dependent variable is the amount of water it needs because the sun dries out the soil.
>
> **d.** The independent variable is the amount of water given to the plant; the dependent variable is the height of the plant.

2. Blake was writing a report for his history class. For every 15 minutes that he worked, he wrote 1 page of the report. What are the dependent and independent variables?

> **a.** The independent variable is the amount of time that he worked; the dependent variable is the number of pages he wrote.
>
> **b.** The independent variable is the topic for his report; the dependent variable is the amount of time he worked.
>
> **c.** The independent variable is the amount of time he worked; the dependent variable is the quality of the pages he wrote.
>
> **d.** The independent variable is the number of pages he wrote; the dependent variable is the topic of his report.

Trying It on Your Own

Solve the problems on your own.

1. Jeremy realized that the more he watered a plant, the more it grew. What are the dependent and independent variables?

a. The independent variable is the height of the plant; the dependent variable is the amount of water.

b. The independent variable is the amount of water the plant needs; the dependent variable is the type of plant.

c. The independent variable is the amount of sunlight; the dependent variable is the amount of water it needs because the sun dries out the soil.

d. The independent variable is the amount of water given to the plant; the dependent variable is the height of the plant.

2. Blake was writing a report for his history class. For every 15 minutes that he worked, he wrote 1 page of the report. What are the dependent and independent variables?

a. The independent variable is the amount of time that he worked; the dependent variable is the number of pages he wrote.

b. The independent variable is the topic for his report; the dependent variable is the amount of time he worked.

c. The independent variable is the amount of time he worked; the dependent variable is the quality of the pages he wrote.

d. The independent variable is the number of pages he wrote; the dependent variable is the topic of his report.

3. Cassie was making friendship bracelets. Each bracelet uses 1 yard of yarn. What are the dependent and independent variables?

a. The independent variable is the number of yards of yarn; the dependent variable is the number of bracelets she made.

b. The independent variable is the number of bracelets she made; the dependent variable is the number of yards of yarn.

c. The independent variable is the number of bracelets she made; the dependent variable is the color of yarn she used.

d. The independent variable is the number of yards of yarn; the dependent variable is the length of the bracelet.

4. Marla spent $22.75 on downloaded songs. What are the independent and dependent variables?

a. The independent variable is the number of songs she downloaded, the dependent variable is the cost of each song.

b. The independent variable is the amount of money she spent; the dependent variable is the number of songs she downloaded.

c. The independent variable is the number of songs she downloaded; the dependent variable is the amount of money she spent.

d. The independent variable is the cost of each song; the dependent variable is the amount of money she spent on downloaded songs.

3. Cassie was making friendship bracelets. Each bracelet uses 1 yard of yarn. What are the dependent and independent variables?

a. The independent variable is the number of yards of yarn; the dependent variable is the number of bracelets she made.

b. The independent variable is the number of bracelets she made; the dependent variable is the number of yards of yarn.

c. The independent variable is the number of bracelets she made; the dependent variable is the color of yarn she used.

d. The independent variable is the number of yards of yarn; the dependent variable is the length of the bracelet.

4. Marla spent $22.75 on downloaded songs. What are the independent and dependent variables?

a. The independent variable is the number of songs she downloaded, the dependent variable is the cost of each song.

b. The independent variable is the amount of money she spent; the dependent variable is the number of songs she downloaded.

c. The independent variable is the number of songs she downloaded; the dependent variable is the amount of money she spent.

d. The independent variable is the cost of each song; the dependent variable is the amount of money she spent on downloaded songs.

Wrapping It Up

Write the unit rate.

1. Bananas sell for 3 pounds for \$2.01. Write the unit rate. ________________

2. 5 T-shirts sell for \$22.75. Write the unit rate. ________________

3. Carmen travels 130 miles in 2 hours. Write the unit rate. ________________

Wrapping It Up

Write the unit rate.

1. Bananas sell for 3 pounds for \$2.01. Write the unit rate. \$.67:1

2. 5 T-shirts sell for \$22.75. Write the unit rate. \$4.55:1

3. Carmen travels 130 miles in 2 hours. Write the unit rate. 65:1

Warming Up:

We are going to play a game called You Say, I Say. I will call on some of you to give me a number. I will put it in the You Say column of the table. Then, I have a rule in my mind that I am going to use on your number. I will record the result in the I Say column. When you think you know the rule, raise your hand but don't say the rule out loud. As we keep going, when you are sure you know the rule, write the rule in the I Say column.

Rules that you can use (You Say number is x, the result is the I Say number):

1. $2x + 1$
2. $3x - 2$
3. $4x$
4. $2x + 5$
5. $3x + 2$
6. $(x + 1) \div 2$
7. $x + 6$
8. $3x + 1$
9. $3x$
10. $2x + 10$

Learning to Solve

Henna made a table to show the amount of money she earns when she works at the craft store.

Number of hours worked	Amount of money earned
1	$5
2	$10
3	
4	$20
	$25
6	$30
	$45
10	

The independent variable ________________________________

The dependent variable ________________________________

Describe the relationship:

Learning to Solve

Henna made a table to show the amount of money she earns when she works at the craft store.

Number of hours worked	Amount of money earned
1	$5
2	$10
3	$15
4	$20
5	$25
6	$30
9	$45
10	$50
x	$5x$

The independent variable Number of hours worked

The dependent variable Amount of money earned

Describe the relationship:

Answers will vary, such as, the total amount of money earned is 5 times the number of hours worked.

Practicing Together:

Work with a partner to complete the tables.

1.

Number of hours worked (m)	Amount of money earned
1	$7.50
2	$15
3	$22.50
4	$30
5	
6	
	$75
	$150
x	

Practicing Together:

Work with a partner to complete the tables.

1.

Number of hours worked (*m*)	Amount of money earned
1	\$7.50
2	\$15
3	\$22.50
4	\$30
5	\$37.50
6	\$45
10	\$75
20	\$150
x	$7.5x$

2.

Number of hours driven	Number of miles
1	
2	110
3	
4	
5	
	550
20	
x	

2.

Number of hours driven	**Number of miles**
1	55
2	110
3	165
4	220
5	275
10	550
20	1,100
x	$55x$

Trying It on Your Own

Solve the problems on your own.

1. Katy made a table to show the relationship between the number of socks knitted and the number of yards of yarn used. What is the generalization or rule that describes the amount of yarn needed?

Number of socks knitted (*x*)	**Number of yards of yarn used**
1	1
2	2
3	3
4	4
14	14
22	22
30	30
x	??

a. x because for every sock, it takes 1 yard of yarn.
b. $3x$ because for 3 socks, it takes 3 yards of yarn.
c. $4x$ because for 4 socks, it takes 4 yards of yarn.
d. $30x$ because for 2 socks, it takes 30 yards of yarn.

Trying It on Your Own

Solve the problems on your own.

1. Katy made a table to show the relationship between the number of socks knitted and the number of yards of yarn used. What is the generalization or rule that describes the amount of yarn needed?

Number of socks knitted (x)	**Number of yards of yarn used**
1	1
2	2
3	3
4	4
14	14
22	22
30	30
x	??

a. x because for every sock, it takes 1 yard of yarn.
b. $3x$ because for 3 socks, it takes 3 yards of yarn.
c. $4x$ because for 4 socks, it takes 4 yards of yarn.
d. $30x$ because for 2 socks, it takes 30 yards of yarn.

2. Ted had his father time him when he does math problems. He made a table. What is the generalization that describes the amount of time it takes him to complete *m* math problems?

Number of math problems (*m*)	**Number of minutes to complete**
1	2
2	4
3	6
4	8
5	10
10	20
20	40
m	??

a. 1*m* because *m* represents the number of math problems.

b. 2*m* because each math problem takes 2 minutes to solve.

c. 3*m* because it takes 6 minutes to solve 3 problems.

d. 10*m* because it takes 20 minutes to solve 10 problems.

2. Ted had his father time him when he does math problems. He made a table. What is the generalization that describes the amount of time it takes him to complete *m* math problems?

Number of math problems (*m*)	**Number of minutes to complete**
1	2
2	4
3	6
4	8
5	10
10	20
20	40
m	??

a. 1*m* because *m* represents the number of math problems.
b. 2*m* because each math problem takes 2 minutes to solve.
c. 3*m* because it takes 6 minutes to solve 3 problems.
d. 10*m* because it takes 20 minutes to solve 10 problems.

3. Nick made a mixture of milk and chocolate syrup. He created a table to show how much chocolate syrup to use with a certain number of cups of milk. He said, "I can write 3*y* as a rule for my table." What does 3*y* tell you?

Number of cups of milk (y)	**Number of tablespoons of chocolate syrup**
1	3
2	6
3	9
4	12
5	15
8	24
15	45

a. 3*y* means that for any number of tablespoons of chocolate syrup (*y*), it takes 3 times as much milk.

b. 3*y* means that for any number of cups of milk (*y*), it takes 3 times as many tablespoons of chocolate syrup.

c. 3*y* means that for 3 cups of milk, you have to use 3 times as much chocolate syrup.

d. 3*y* means that for 3 tablespoons of chocolate syrup, you have to use 3 times as much milk.

3. Nick made a mixture of milk and chocolate syrup. He created a table to show how much chocolate syrup to use with a certain number of cups of milk. He said, "I can write 3*y* as a rule for my table." What does 3*y* tell you?

Number of cups of milk (*y*)	Number of tablespoons of chocolate syrup
1	3
2	6
3	9
4	12
5	15
8	24
15	45

a. 3*y* means that for any number of tablespoons of chocolate syrup (*y*), it takes 3 times as much milk.
b. 3*y* means that for any number of cups of milk (*y*), it takes 3 times as many tablespoons of chocolate syrup.
c. 3*y* means that for 3 cups of milk, you have to use 3 times as much chocolate syrup.
d. 3*y* means that for 3 tablespoons of chocolate syrup, you have to use 3 times as much milk.

4. Angie said, "For any number of oranges (k) in my salad, I have to use one-third as many cups of coconut flakes." Which represents the amount of coconut flakes needed in the salad?

a. $3k$ because multiplying by 3 is the inverse of one-third.

b. $k + 3$ because adding 3 is the same as multiplying by one-third.

c. $\frac{1}{3}k$ because multiplying by one-third means that there is 3 times as many oranges.

d. $3k$ because I need 3 times as many oranges.

4. Angie said, "For any number of oranges (k) in my salad, I have to use one-third as many cups of coconut flakes." Which represents the amount of coconut flakes needed in the salad?

a. $3k$ because multiplying by 3 is the inverse of one-third.

b. $k + 3$ because adding 3 is the same as multiplying by one-third.

c. $\frac{1}{3}k$ because multiplying by one-third means that there is 3 times as many oranges.

d. $3k$ because I need 3 times as many oranges.

Wrapping It Up

Write the generalization, using a variable, that shows the following:

For every cup of rice, it takes 3 cups of water to cook it.

Wrapping It Up

Write the generalization, using a variable, that shows the following:

For every cup of rice, it takes 3 cups of water to cook it.

If x is the number of cups of rice, $3x$ is the amount of water.

Warming Up:

Find the unit rate.

1. Steak is priced at $44.94 for 6 pounds. ________________

2. Eggs are priced at $3.75 for $1\frac{1}{2}$ dozen. ________________

Warming Up:

Find the unit rate.

1. Steak is priced at \$44.94 for 6 pounds. \$7.49:1

2. Eggs are priced at \$3.75 for $1\frac{1}{2}$ dozen. \$2.50:1

Learning to Solve:

1.

Number of cups of milk	Number of tablespoons of chocolate syrup
1	3
2	6
3	9
4	12
5	15
8	24
15	45

________________ variable

________________ variable

Learning to Solve:

1.

Number of cups of milk	**Number of tablespoons of chocolate syrup**
1	3
2	6
3	9
4	12
5	15
8	24
15	45
x	$3x$

↑ ↑

Independent variable

Dependent variable

2.

Number of math problems	**Number of minutes to complete**
1	2
2	4
3	6
4	8
5	10
10	20
20	40
x	$2x$

Match the items in the left column to independent or dependent variable in the right column.

Number of math problems

Independent variable

2 times the number of math problems

$2x$

Dependent variable

x

2.

Number of math problems	Number of minutes to complete
1	2
2	4
3	6
4	8
5	10
10	20
20	40
x	$2x$

Match the items in the left column to independent or dependent variable in the right column.

Number of math problems

Independent variable

2 times the number of math problems

$2x$

Dependent variable

x

Practicing Together

Josie made $4.50 per hour babysitting. Complete the table.

Number of hours babysitting	Amount of money earned
1	
2	
3	
4	
5	
10	$45
20	
x	

x = Number of hours babysitting

__________ = Amount of money earned

The independent variable is __________ , the number of hours babysitting.

The dependent variable is __________, the amount of money earned.

Practicing Together

Josie made \$4.50 per hour babysitting. Complete the table.

Number of hours babysitting	Amount of money earned
1	\$4.50
2	\$9
3	\$13.50
4	\$18
5	\$22.50
10	\$45
20	\$90
x	$4.50x$

x = Number of hours babysitting

$4.50x$ = Amount of money earned

The independent variable is x, the number of hours babysitting.

The dependent variable is $4.50x$, the amount of money earned.

Trying It on Your Own

Solve the problems on your own.

Each banner that Tobi made required 1.5 quarts of paint. Her table is below. Use this information to solve problems 1 and 2.

Number of banners	Number of quarts of paint
1	1.5
2	3
3	4.5
4	6
5	7.5
10	15
20	30
x	$1.5x$

1. Which describes the independent and dependent variables?

a. The independent variable is the number of banners (x); the dependent variable is $1.5x$.

b. The independent variable is the number of quarts of paint; the dependent variable is the number of banners.

c. The independent variable is the number of banners ($1.5x$); the dependent variable is x.

d. The independent variable is the number of quarts of paint (x); the dependent variable is $1.5x$.

Trying It on Your Own

Solve the problems on your own.

Each banner that Tobi made required 1.5 quarts of paint. Her table is below. Use this information to solve problems 1 and 2.

Number of banners	Number of quarts of paint
1	1.5
2	3
3	4.5
4	6
5	7.5
10	15
20	30
x	$1.5x$

1. Which describes the independent and dependent variables?

a. The independent variable is the number of banners (x); the dependent variable is $1.5x$.

b. The independent variable is the number of quarts of paint; the dependent variable is the number of banners.

c. The independent variable is the number of banners ($1.5x$); the dependent variable is x.

d. The independent variable is the number of quarts of paint (x); the dependent variable is $1.5x$.

2. Tobi used 60 quarts of paint. How many banners did she paint?

- **a.** She painted 90 banners.
- **b.** She painted 60 banners.
- **c.** She painted 40 banners.
- **d.** She painted 30 banners.

Sherman went to the grocery store to buy a salad at the salad bar. The store charges $5.99 per half-pound of salad. Use this information to solve problems 3 and 4.

3. How much would Sherman pay for $3\frac{1}{2}$ pounds of salad?

- **a.** $41.93
- **b.** $20.97
- **c.** $17.97
- **d.** $8.99

2. Tobi used 60 quarts of paint. How many banners did she paint?

a. She painted 90 banners.
b. She painted 60 banners.
c. She painted 40 banners.
d. She painted 30 banners.

Sherman went to the grocery store to buy a salad at the salad bar. The store charges $5.99 per half-pound of salad. Use this information to solve problems 3 and 4.

3. How much would Sherman pay for $3\frac{1}{2}$ pounds of salad?

a. $41.93
b. $20.97
c. $17.97
d. $8.99

4. If the amount of salad in pounds is the independent variable *p*, which of the following describes the dependent variable?

a. $5.99p$ because you multiply the amount of salad by the cost per half-pound.

b. $5.99p \times 2$ because the amount of salad is in pounds so you have to double the amount.

c. $5.99p + 2$ because the amount of salad is in pounds so you have to double the amount.

d. $5.99p \div 2$ because the amount of salad is in pounds so you have to divide by 2.

4. If the amount of salad in pounds is the independent variable *p*, which of the following describes the dependent variable?

a. $5.99p$ because you multiply the amount of salad by the cost per half-pound.

b. $5.99p \times 2$ because the amount of salad is in pounds so you have to double the amount.

c. $5.99p + 2$ because the amount of salad is in pounds so you have to double the amount.

d. $5.99p \div 2$ because the amount of salad is in pounds so you have to divide by 2.

Appendices

Ratios and Proportions

1

Warming Up:

Mary Ellen is planting flowers in front of her house. For each 3 pots of white petunias, she plants 5 pots of red petunias.

1. When she is finished planting all her flowers, which color of petunia will she have the most of? Circle your answer.

White petunias		Red petunias

2. Write the ratio of the number of pots of white petunias to the number of pots of red petunias: ______________

3. If Mary Ellen plants 9 pots of white petunias, how many pots of red petunias will she need to keep the same ratio? ______________

4. If Mary Ellen plants 25 pots of red petunias, how many pots of white petunias will she need to keep the same ratio? ______________

Warming Up:

Mary Ellen is planting flowers in front of her house. For each 3 pots of white petunias, she plants 5 pots of red petunias.

1. When she is finished planting all her flowers, which color of petunia will she have the most of? Circle your answer.

White petunias   Red petunias

2. Write the ratio of the number of pots of white petunias to the number of pots of red petunias: 3:5

3. If Mary Ellen plants 9 pots of white petunias, how many pots of red petunias will she need to keep the same ratio? 15

4. If Mary Ellen plants 25 pots of red petunias, how many pots of white petunias will she need to keep the same ratio? 15

Learning to Solve:

Find the missing value: $\frac{2}{7} = \frac{20}{x}$.

1. Write the product of 7 and 20. __________

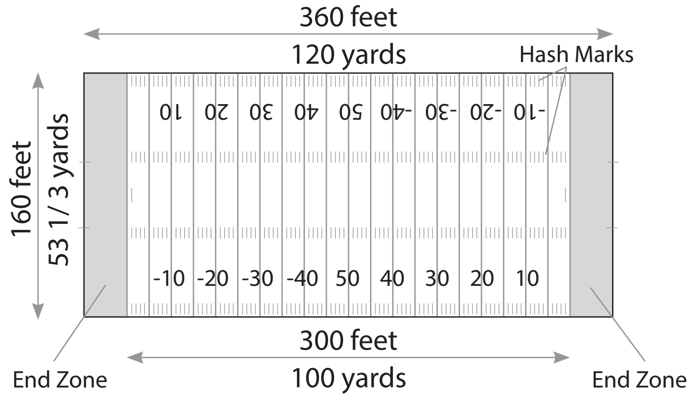
2. Write the product of 2 and *x*. __________

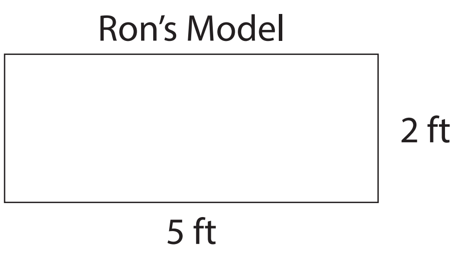
3. Because this is a proportion, the 2 products are equal. Write the products as an equation.

____

4. Find the value of *x*. $x =$ __________

The width of a football field is 160 feet and the length is 360 ft. Ron is making a model of a football field for a class project. Are the dimensions in the model in the same ratio as the dimensions of a regulation size football field? How do you know? Explain.





Learning to Solve:

Find the missing value: $\frac{2}{7} = \frac{20}{x}$.

1. Write the product of 7 and 20. 140

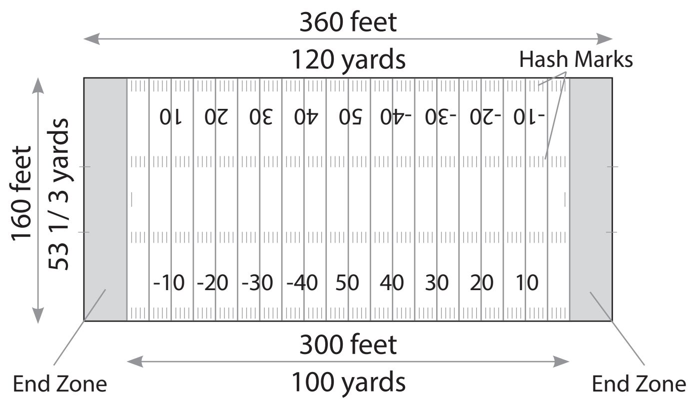
2. Write the product of 2 and *x*. $2x$

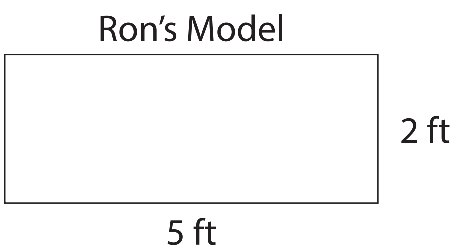
3. Because this is a proportion, the 2 products are equal. Write the products as an equation.

$2x = 140$ or $140 = 2x$

4. Find the value of *x*. $x =$ 70

The width of a football field is 160 feet and the length is 360 ft. Ron is making a model of a football field for a class project. Are the dimensions in the model in the same ratio as the dimensions of a regulation size football field? How do you know? Explain.





No, the dimensions of the model are not in the same ratio as the dimensions of a regulation size football field.

One explanation: The ratio of the model is $\frac{2}{5}$ $(\frac{\text{width}}{\text{length}})$ and the ratio of the football field is $\frac{160}{360}$ $(\frac{\text{width}}{\text{length}})$. If you simplify $\frac{160}{360}$, the ratio is $\frac{4}{9}$. The ratio $\frac{2}{5}$ is not equal to $\frac{4}{9}$.

Another explanation: If the ratio of the model and the football field were the same, the proportion would be equal. This means that $\frac{160}{360} = \frac{2}{5}$. Using cross-multiplication, the equation would be $(160)(5) = (360)(2)$, or $800 = 720$, which is not true.

Practicing Together

For every 2 grams of carbohydrates, there are 150 milligrams of calcium in a slice of American cheese.

1. Write the ratio of the number of carbohydrate grams to the number of calcium milligrams in a slice of cheese.

2. Steve is trying to get more calcium in his diet so his bones stay strong. At the same time, he wants to watch the amount of carbohydrates in his food. If he gets 450 milligrams calcium in the slices of American cheese he eats, how many carbohydrates will he get if he keeps the same ratio?

3. Write the proportion that shows this relationship.

Find the missing value.

4. $\frac{6}{x} = \frac{3}{4}$

5. $\frac{x}{5} = \frac{8}{20}$

Practicing Together

For every 2 grams of carbohydrates, there are 150 milligrams of calcium in a slice of American cheese.

1. Write the ratio of the number of carbohydrate grams to the number of calcium milligrams in a slice of cheese.

$\frac{2}{150}$

2. Steve is trying to get more calcium in his diet so his bones stay strong. At the same time, he wants to watch the amount of carbohydrates in his food. If he gets 450 milligrams calcium in the slices of American cheese he eats, how many carbohydrates will he get if he keeps the same ratio?

6 grams of carbohydrates

3. Write the proportion that shows this relationship.

$\frac{2}{150} = \frac{6}{450}$

Find the missing value.

4. $\frac{6}{x} = \frac{3}{4}$ $x = 8$

5. $\frac{x}{5} = \frac{8}{20}$ $x = 2$

Trying It on Your Own

Jan and Marcia were swimming laps at the same pace at the school pool. Marcia started first. When Marcia had swam 5 laps, Jan had swam 2 laps.

1. The ratio of the number of laps Marcia swam to the number of laps Jan swam is:

- **a.** 2:5
- **b.** 5:2
- **c.** 1:5
- **d.** 5:1

2. When Jan finished 6 laps, how many laps had Marcia swam?

- **a.** 15
- **b.** 1.5
- **c.** 10
- **d.** 2.5

Trying It on Your Own

Jan and Marcia were swimming laps at the same pace at the school pool. Marcia started first. When Marcia had swam 5 laps, Jan had swam 2 laps.

1. The ratio of the number of laps Marcia swam to the number of laps Jan swam is:

- **a.** 2:5
- **b.** 5:2
- **c.** 1:5
- **d.** 5:1

2. When Jan finished 6 laps, how many laps had Marcia swam?

- **a.** 15
- **b.** 1.5
- **c.** 10
- **d.** 2.5

3. Which of the following proportions could the swim coach use to determine how many laps Jan swam if Marcia swam 35 laps?

a. $\frac{x}{35} = \frac{5}{2}$

b. $\frac{35}{x} = \frac{2}{5}$

c. $\frac{5}{35} = \frac{x}{2}$

d. $\frac{x}{35} = \frac{2}{5}$

4. The value of x that makes $\frac{5}{2} = \frac{x}{10}$ true is:

a. 50
b. 10
c. 40
d. 25

3. Which of the following proportions could the swim coach use to determine how many laps Jan swam if Marcia swam 35 laps?

a. $\frac{x}{35} = \frac{5}{2}$

b. $\frac{35}{x} = \frac{2}{5}$

c. $\frac{5}{35} = \frac{x}{2}$

d. $\frac{x}{35} = \frac{2}{5}$

4. The value of x that makes $\frac{5}{2} = \frac{x}{10}$ true is:

a. 50
b. 10
c. 40
d. 25

Wrapping It Up

Directions:

We are going to play Prop 4. You will shuffle your cards. The first player will take a card and match it to an equivalent ratio on your board by covering it with your color counter. Then the next player takes a turn and does the same. Continue playing until someone has 4 counters in a row, up, down or diagonally. Some ratios may have more than one match and there may be some that have no match.

Warming Up:

Find the missing value.

1. $\frac{6}{x} = \frac{9}{15}$ $x =$ ________

2. $\frac{x}{7} = \frac{12}{21}$ $x =$ ________

3. $\frac{2}{50} = \frac{x}{75}$ $x =$ ________

Warming Up:

Find the missing value.

1. $\frac{6}{x} = \frac{9}{15}$ $x =$ 10

2. $\frac{x}{7} = \frac{12}{21}$ $x =$ 4

3. $\frac{2}{50} = \frac{x}{75}$ $x =$ 3

Learning to Solve:

For every 6 pounds that a person weighs on Earth, they weigh 1 pound on the moon.

1. Create a table to show the equivalent ratios that describe this relationship.

Weight on Earth (in pounds)	Weight on the Moon (in pounds)

2. Write the unit rate that shows the number of pounds a person weighs on Earth for every pound they weigh on the moon. ________________

3. If a person weighs 138 pounds on Earth, how much will they weigh on the moon?

____

4. If a person weighs 2.5 pounds on the moon, how much will they weigh on Earth?

____

Learning to Solve:

For every 6 pounds that a person weighs on Earth, they weigh 1 pound on the moon.

1. Create a table to show the equivalent ratios that describe this relationship.
Answers will vary in the table. The following are examples.

Weight on Earth (in pounds)	Weight on the Moon (in pounds)
6	1
12	2
18	3
24	4
30	5

2. Write the unit rate that shows the number of pounds a person weighs on Earth for every pound they weigh on the moon. 6:1

3. If a person weighs 138 pounds on Earth, how much will they weigh on the moon?
23 pounds

4. If a person weighs 2.5 pounds on the moon, how much will they weigh on Earth?
15 pounds

$$\frac{6}{1} = \frac{x}{2.5}$$

Practicing Together

Martha is making a lemon cake. Two of the ingredients are frozen lemonade and whipped cream. For every 6 ounces of frozen lemonade, you need 8 ounces of whipped cream.

1. Create a table to show equivalent ratios for the relationship.

Number of ounces of frozen lemonade	Number of ounces of whipped cream
3	
6	8

2. Write the unit rate that shows the number of ounces of whipped cream for every ounce of frozen lemonade. ______________

3. If Martha buys two 12-ounce cans of frozen lemonade, how many ounces of whipped cream will she need? ________________________

Practicing Together

Martha is making a lemon cake. Two of the ingredients are frozen lemonade and whipped cream. For every 6 ounces of frozen lemonade, you need 8 ounces of whipped cream.

1. Create a table to show equivalent ratios for the relationship.

Number of ounces of frozen lemonade	Number of ounces of whipped cream
3	4
6	8
9	12
12	16
15	20

2. Write the unit rate that shows the number of ounces of whipped cream for every ounce of frozen lemonade. $1\frac{1}{3}:1$

3. If Martha buys two 12-ounce cans of frozen lemonade, how many ounces of whipped cream will she need? 32 ounces of whipped cream

Trying It on Your Own

Solve the problems on your own.

Carl can run an 8-kilometer race in 36 minutes.

1. Which table shows this relationship?

a.

Number of kilometers	Number of minutes
2	30
4	32
6	34
8	36

b.

Number of kilometers	Number of minutes
1	4.5
2	9
3	13.5
4	18

c.

Number of kilometers	Number of minutes
8	36
16	72
32	108
64	144

d.

Number of kilometers	Number of minutes
1	4
2	8
3	12
4	16

Trying It on Your Own

Solve the problems on your own.

Carl can run an 8-kilometer race in 36 minutes.

1. Which table shows this relationship?

a.

Number of kilometers	Number of minutes
2	30
4	32
6	34
8	36

b.

Number of kilometers	Number of minutes
1	4.5
2	9
3	13.5
4	18

c.

Number of kilometers	Number of minutes
8	36
16	72
32	108
64	144

d.

Number of kilometers	Number of minutes
1	4
2	8
3	12
4	16

2. What is the unit rate for the number of minutes ran per kilometer?

- **a.** 288:1
- **b.** 2:9
- **c.** 8:36
- **d.** 4.5:1

3. Carl wanted to run for 45 minutes. How many kilometers will he run?

- **a.** 10 kilometers
- **b.** 40.5 kilometers
- **c.** 11.25 kilometers
- **d.** 17 kilometers

2. What is the unit rate for the number of minutes ran per kilometer?

a. 288:1
b. 2:9
c. 8:36
d. 4.5:1

3. Carl wanted to run for 45 minutes. How many kilometers will he run?

a. 10 kilometers
b. 40.5 kilometers
c. 11.25 kilometers
d. 17 kilometers

4. Which of the following proportions could Carl use to help him determine how many minutes he will run if he runs a 26-kilometer race?

a. $\frac{8}{36} = \frac{x}{26}$

b. $\frac{26}{x} = \frac{8}{36}$

c. $\frac{2}{9} = \frac{x}{26}$

d. $\frac{1}{4.5} = \frac{36}{x}$

4. Which of the following proportions could Carl use to help him determine how many minutes he will run if he runs a 26-kilometer race?

a. $\frac{8}{36} = \frac{x}{26}$

b. $\frac{26}{x} = \frac{8}{36}$

c. $\frac{2}{9} = \frac{x}{26}$

d. $\frac{1}{4.5} = \frac{36}{x}$

Wrapping It Up

We are going to play a game called You Say, I Say. I will call on some of you to give me a number. I will put it in the You Say column of the table. Then, I have a rule in my mind that I am going to use on your number. I will record the result in the I Say column. When you think you know the rule, raise your hand but don't say the rule out loud. As we keep going, when you are sure you know the rule, write the rule in the I Say column.

Rules that you can use (You Say number is x, the result is the I Say number):

1. $2x + 1$
2. $3x - 2$
3. $4x$
4. $2x + 5$
5. $3x + 2$
6. $(x + 1) \div 2$
7. $x + 6$
8. $3x + 1$
9. $3x$
10. $2x + 10$

Warming Up:

We are going to play a game called You Say, I Say. I will call on some of you to give me a number. I will put it in the You Say column of the table. Then, I have a rule in my mind that I am going to use on your number. I will record the result in the I Say column. When you think you know the rule, raise your hand but don't say the rule out loud. As we keep going, when you are sure you know the rule, write the rule in the I Say column.

Rules that you can use (You Say number is x, the result is the I Say number):

1. $2x + 1$
2. $3x - 2$
3. $4x$
4. $2x + 5$
5. $3x + 2$
6. $(x + 1) \div 2$
7. $x + 6$
8. $3x + 1$
9. $3x$
10. $2x + 10$

Learning to Solve:

The sixth-grade class is selling hot dogs at the softball game to raise money for their field trip. For every 10 hot dogs they sell, they earn $25.

1. Write a description of the relationship between the hot dogs and money earned.

2. What is the ratio of the number of hot dogs sold to the amount of money earned?

____

3. What is the unit rate? ______________

4. Independent variable ___________________________________

5. Dependent variable ___________________________________

6. Create a table showing equivalent ratios for this relationship.

Number of hot dogs sold ________________**variable**	**Amount of money earned** ________________**variable**

Learning to Solve:

The sixth-grade class is selling hot dogs at the softball game to raise money for their field trip. For every 10 hot dogs they sell, they earn $25.

1. Write a description of the relationship between the hot dogs and money earned.

For each 10 hot dogs that the 6th grade students sell, they will earn $25.

2. What is the ratio of the number of hot dogs sold to the amount of money earned?

10:$25 or any equivalent ratio

3. What is the unit rate? 1:$2.50

4. Independent variable Number of hot dogs sold

5. Dependent variable Amount of money earned

6. Create a table showing equivalent ratios for this relationship.

Number of hot dogs sold Independent **variable**	**Amount of money earned** Dependent **variable**
10	$25
15	$37.50
20	$50
25	$62.50

Practicing Together

Work with a partner.

At the beach, you can rent 2 umbrellas for $15.

1. What is the unit rate? ______________

2. What is the ratio of the number of umbrellas rented to the cost? ______________

3. Independent variable ___________________________________

4. Dependent variable ___________________________________

5. Write a description of the relationship between the number of umbrellas rented and the total cost.

6. Create a table showing equivalent ratios for this relationship.

Number of umbrellas rented __________________ **variable**	**Cost of rental** __________________ **variable**

Practicing Together

Work with a partner.

At the beach, you can rent 2 umbrellas for $15.

1. What is the unit rate? 1:$7.50

2. What is the ratio of the number of umbrellas rented to the cost? 2:$15

3. Independent variable Number of umbrellas rented

4. Dependent variable Total cost

5. Write a description of the relationship between the number of umbrellas rented and the total cost.

For every 2 umbrellas that are rented, it costs $15.

6. Create a table showing equivalent ratios for this relationship.

Number of umbrellas rented Independent **variable**	**Cost of rental** Dependent **variable**
2	15
4	30
6	45
8	60

Trying It on Your Own

Work on your own. Use the following situation to answer the questions.

A typical compact car can travel 520 miles on 1 tank of gas. The tank of gas holds 20 gallons.

1. What is the unit rate for the number of miles traveled per gallon of gas?

- **a.** 1:520
- **b.** 2:9
- **c.** 26:1
- **d.** 20:520

2. You have enough money to fill only half of your empty tank. How far can you travel?

- **a.** 520 miles
- **b.** 52 miles
- **c.** 260 miles
- **d.** 500 miles

Trying It on Your Own

Work on your own. Use the following situation to answer the questions.

A typical compact car can travel 520 miles on 1 tank of gas. The tank of gas holds 20 gallons.

1. What is the unit rate for the number of miles traveled per gallon of gas?

- **a.** 1:520
- **b.** 2:9
- **c.** 26:1
- **d.** 20:520

2. You have enough money to fill only half of your empty tank. How far can you travel?

- **a.** 520 miles
- **b.** 52 miles
- **c.** 260 miles
- **d.** 500 miles

3. Which statement describes the relationship between distance traveled and gallons of gas?

a. The number of gallons of gas is dependent on the number of miles traveled.

b. You can travel 20 miles on 1 gallon of gas.

c. The number of miles traveled is independent of the number of gallons of gas in the tank.

d. The number of miles traveled depends on the number of gallons of gas in the tank.

4. Monique says that the independent variable is the number of miles traveled. Roger says that he thinks the independent variable is the number of gallons of gas. Find the best answer that shows who is correct.

a. Roger, because the number of gallons of gas and number of miles traveled are related.

b. Roger, because the number of gallons of gas is used to find the number of miles traveled.

c. Monique, because the number of miles traveled is used to find the number of gallons of gas.

d. Monique, because you need to have gas before you travel.

3. Which statement describes the relationship between distance traveled and gallons of gas?

a. The number of gallons of gas is dependent on the number of miles traveled.

b. You can travel 20 miles on 1 gallon of gas.

c. The number of miles traveled is independent of the number of gallons of gas in the tank.

d. The number of miles traveled depends on the number of gallons of gas in the tank.

4. Monique says that the independent variable is the number of miles traveled. Roger says that he thinks the independent variable is the number of gallons of gas. Find the best answer that shows who is correct.

a. Roger, because the number of gallons of gas and number of miles traveled are related.

b. Roger, because the number of gallons of gas is used to find the number of miles traveled.

c. Monique, because the number of miles traveled is used to find the number of gallons of gas.

d. Monique, because you need to have gas before you travel.

Wrapping It Up

For each situation, write "IV" above the independent variable and "DV" above the dependent variable.

1. Korie earns $4.50 for each hour that she babysits.

2. The basketball coach has made a deal with the players. When they make

5 shots in a row, he will give them 10 minutes of free time.

3. For every 4 yellow pieces of candy in the bag, the candy manufacturer puts

3 orange pieces of candy in the bag.

Wrapping It Up

For each situation, write "IV" above the independent variable and "DV" above the dependent variable.

DV IV
1. Korie earns $4.50 for each hour that she babysits.

2. The basketball coach has made a deal with the players. When they make
IV DV
5 shots in a row, he will give them 10 minutes of free time.

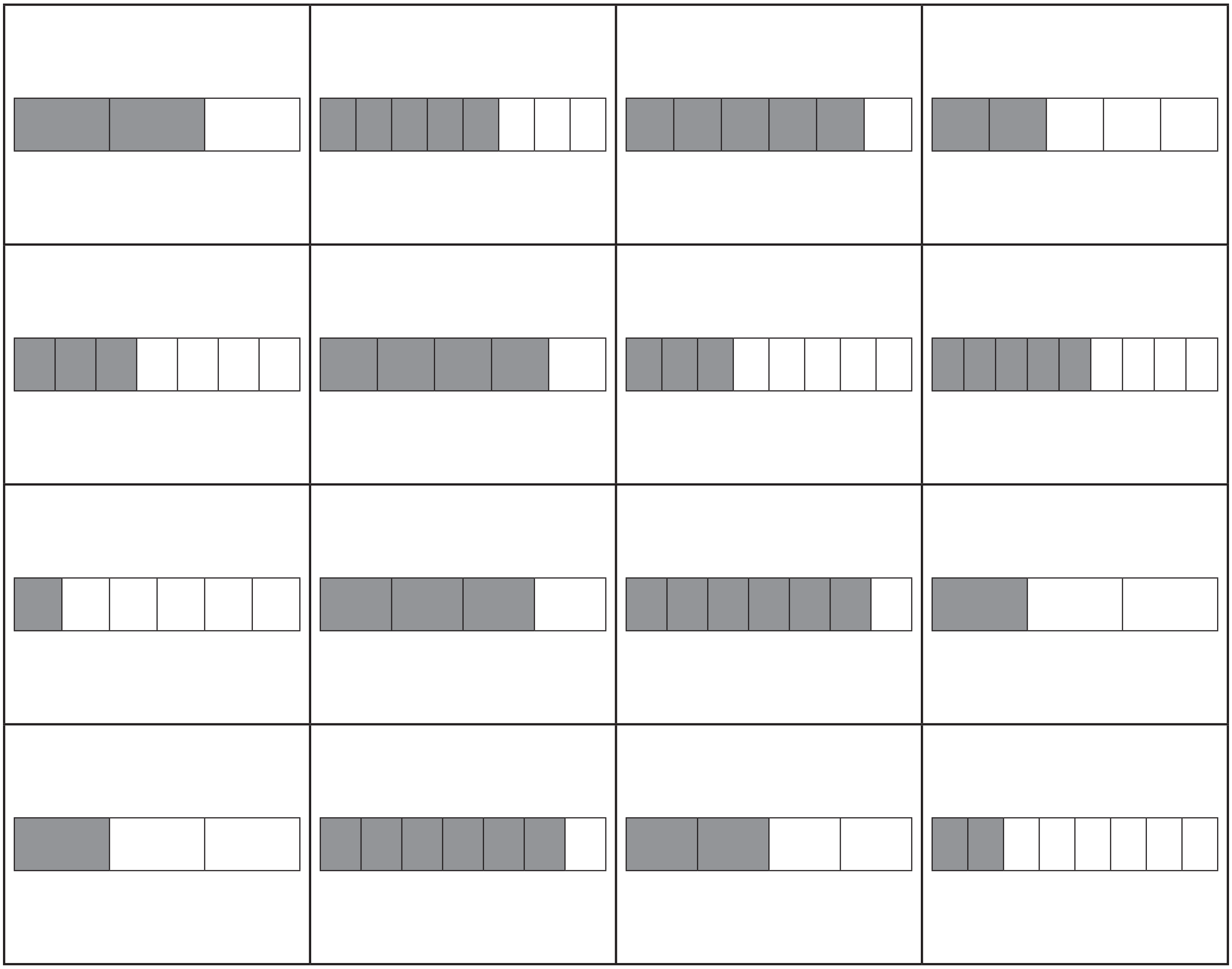
IV
3. For every 4 yellow pieces of candy in the bag, the candy manufacturer puts
DV
3 orange pieces of candy in the bag.

Masters for Game and Activity Cards

Ratios and Proportions

1

3-in-a-Row Game Sheet for Lessons 2 and 3



3-in-a-Row Game Cards for Lesson 2 and 3

Ratio of Shaded to Unshaded **2:1**	**Ratio of Shaded to Unshaded** **2:2**	**Ratio of Shaded to Unshaded** **1:2**	**Ratio of Shaded to Unshaded** **5:3**
Ratio of Shaded to Unshaded **2:3**	**Ratio of Shaded to Unshaded** **3:4**	**Ratio of Shaded to Unshaded** **4:1**	**Ratio of Shaded to Unshaded** **1:2**
Ratio of Shaded to Unshaded **1:5**	**Ratio of Shaded to Unshaded** **3:1**	**Ratio of Shaded to Unshaded** **4:3**	**Ratio of Shaded to Unshaded** **3:5**
Ratio of Shaded to Unshaded **5:1**	**Ratio of Shaded to Unshaded** **6:1**	**Ratio of Shaded to Unshaded** **5:4**	**Ratio of Shaded to Unshaded** **2:7**

Prop 4 Game Cards for Lessons 6 and 6A

$\frac{1}{4}$	$\frac{2}{3}$	$\frac{1}{3}$
$\frac{5}{10}$	$\frac{3}{4}$	$\frac{1}{1}$

$\frac{2}{9}$	$\frac{5}{7}$	$\frac{3}{8}$
$\frac{1}{8}$	$\frac{1}{5}$	$\frac{2}{5}$

$\frac{3}{5}$	$\frac{4}{5}$	$\frac{3}{7}$
$\frac{4}{7}$	$\frac{5}{6}$	$\frac{1}{7}$

$\frac{5}{8}$	$\frac{7}{8}$	$\frac{2}{3}$
$\frac{4}{3}$	$\frac{1}{9}$	$\frac{3}{10}$

Prop 4 Game Board for Lesson 6 and 6A

$\frac{2}{8}$	$\frac{3}{9}$	$\frac{4}{6}$	$\frac{75}{100}$
$\frac{1}{2}$	$\frac{4}{32}$	$\frac{10}{10}$	$\frac{6}{27}$
$\frac{9}{24}$	$\frac{10}{14}$	$\frac{9}{21}$	$\frac{5}{25}$
$\frac{8}{14}$	$\frac{15}{18}$	$\frac{4}{10}$	$\frac{15}{24}$
$\frac{9}{24}$	$\frac{14}{16}$	$\frac{12}{20}$	$\frac{4}{28}$

Create the Rate Game Sheet (Version 1, Player A) for Lesson 8

Version 1: Player A

Round 1

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	_____ _____ : _____	0 1

Round 2

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	_____ _____ : _____	0 1

Round 3

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	_____ _____ : _____	0 1

Round 4

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	_____ _____ : _____	0 1

Round 5

Cards	Unit Rate	Circle Score
☐ ☐ : ☐	_____ _____ : _____	0 1

Total Score: _____

Create the Rate Game Sheet (Version 1, Player B) for Lesson 8

Version 1: Player B

Round 1

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	_____ _____ : _____	0	1

Round 2

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	_____ _____ : _____	0	1

Round 3

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	_____ _____ : _____	0	1

Round 4

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	_____ _____ : _____	0	1

Round 5

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐	_____ _____ : _____	0	1

Total Score: _____

Create the Rate Game Sheet (Version 2, Player A) for Lesson 8

Version 2: Player A

Round 1

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐ ☐	______ ______ : ______	0	1

Round 2

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐ ☐	______ ______ : ______	0	1

Round 3

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐ ☐	______ ______ : ______	0	1

Round 4

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐ ☐	______ ______ : ______	0	1

Round 5

Cards	Unit Rate	Circle Score	
☐ ☐ : ☐ ☐	______ ______ : ______	0	1

Total Score: ______

Create the Rate Game Sheet (Version 2, Player B) for Lesson 8

Version 2: Player B

Round 1

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	_____ _____ : _____	0 1

Round 2

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	_____ _____ : _____	0 1

Round 3

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	_____ _____ : _____	0 1

Round 4

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	_____ _____ : _____	0 1

Round 5

Cards	Unit Rate	Circle Score
☐ ☐ : ☐ ☐	_____ _____ : _____	0 1

Total Score: _____

You Say, I Say Game Sheets for Lessons 9, 10A, 13, 13A, and 14

You Say	I Say

You Say	I Say

You Say	I Say

You Say	I Say

Ratio Round-Up Mat for Lesson 10

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

Ratio Round-Up Cards for Lesson 10

2:4	50:100	1:2	$2:\frac{1}{2}$
50:25	60:30	82:41	14:7
$1:\frac{1}{2}$	2:6	1:3	8:24
30:90	$\frac{1}{9}:\frac{1}{3}$	6:2	900:300
$\frac{1}{3}:\frac{1}{9}$	300:100		

Match the Unit Rate Cards for Lesson 11

30:10	6:2	12:4
12:3	20:5	100:25
2:4	5:10	15:30
36:6	12:2	24:4
100:5	60:3	80:4
2:7	1:4	5:100
15:3	30:6	100:20
1:3	20:60	15:45
8:8	100:100	25:25
100:10	90:9	70:7

Reba's Rectangle Game Cards for Lesson 12

Reba's Rectangle

The unit rate of orange blocks to blue blocks is 3:1.

Make Reba's Rectangle. Can you color more than 1 rectangle that matches these ratios?

Reba's Rectangle

The ratio of orange blocks to red blocks is 6:3.

Make Reba's Rectangle. Can you color more than 1 rectangle that matches these ratios?

Reba's Rectangle

The ratio of orange blocks to green blocks is 2:1.

Make Reba's Rectangle. Can you color more than 1 rectangle that matches these ratios?

Reba's Rectangle

The unit rate of orange blocks to yellow blocks is 1:1.

Make Reba's Rectangle. Can you color more than 1 rectangle that matches these ratios?

Reba's Rectangle Grid Sheet for Lesson 12

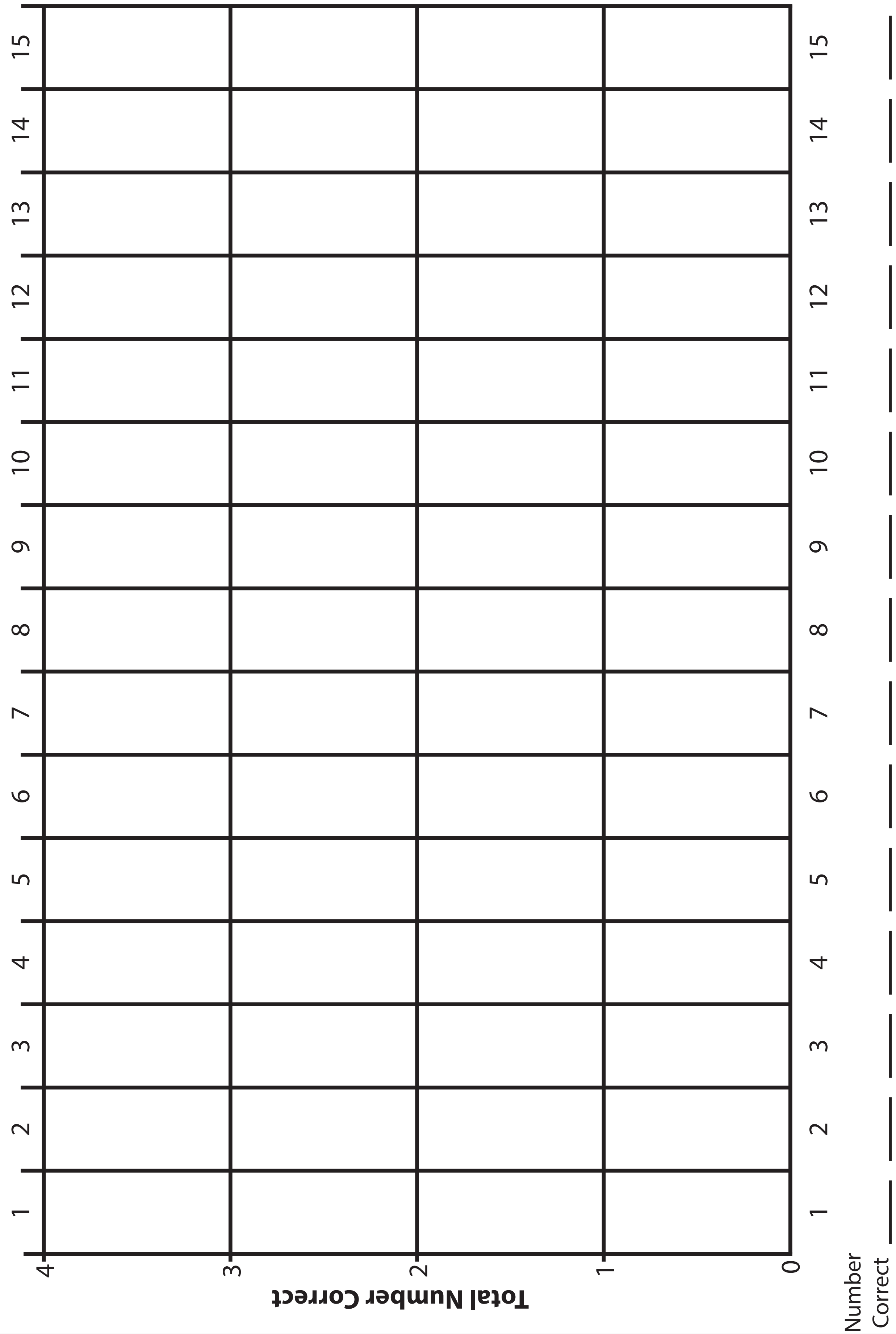
Notes

Ratios and Proportions 1

Generalizations	Picture	Example

Name ____________

Graph Your Progress



Ratios and Proportions 1

Extra Practice

Additional Practice

1. Darin made a trail mix. He mixed 3 cups of peanuts for every 2 cups of coconut. Which of the following is the ratio of cups of coconut to cups of peanuts?

- **a.** 3:2
- **b.** 2:3
- **c.** 3:5
- **d.** 2:5

2. Jerome wrote ratios related to the number of sides in a hexagon to the number of hexagons. Write at least 3 ratios that Jerome could have written.

Additional Practice

1. Darin made a trail mix. He mixed 3 cups of peanuts for every 2 cups of coconut. Which of the following is the ratio of cups of coconut to cups of peanuts?

a. 3:2
b. 2:3
c. 3:5
d. 2:5

2. Jerome wrote ratios related to the number of sides in a hexagon to the number of hexagons. Write at least 3 ratios that Jerome could have written.

Answers will vary. For example, 6:1

3. Which of the following describes a situation that could be represented by the ratio 3:1?

a. Carmen used $\frac{1}{3}$ cup of flour in her cookie recipe.

b. Carmen used 3 cups of flour in her cookie recipe.

c. Carmen used 3 cups of milk for every egg in her cookie recipe.

d. Carmen made 3 dozen cookies.

4. Jeff made trail mix with a ratio of 3:5 (number of cups of raisins to number of cups of almonds). He makes one batch of the mix. How many total cups of trail mix will he have?

a. 3 cups
b. 5 cups
c. 8 cups
d. It is not possible to determine.

3. Which of the following describes a situation that could be represented by the ratio 3:1?

a. Carmen used $\frac{1}{3}$ cup of flour in her cookie recipe.

b. Carmen used 3 cups of flour in her cookie recipe.

c. Carmen used 3 cups of milk for every egg in her cookie recipe.

d. Carmen made 3 dozen cookies.

4. Jeff made trail mix with a ratio of 3:5 (number of cups of raisins to number of cups of almonds). He makes one batch of the mix. How many total cups of trail mix will he have?

a. 3 cups
b. 5 cups
c. 8 cups
d. It is not possible to determine.

Additional Practice

1. Alee said, "The ratio of 1:5 shows the relationship of the number of pentagons and the number of sides." Which of the following is another way to describe this relationship?

a. There are 5 times as many pentagons as there are sides.

b. There are 5 times as many sides as there are pentagons.

c. Some pentagons will have 5 sides

d. For every 5 pentagons, there will be 5 sides.

2. Josh said, "I have one-fourth as many toys as I have books." Which of the following describes this relationship?

a. 1 book to 4 toys

b. $\frac{1}{4}$ book to 4 toys

c. 4 books to 1 toy

d. 4 books to $\frac{1}{4}$ toy

Additional Practice

1. Alee said, “The ratio of 1:5 shows the relationship of the number of pentagons and the number of sides.” Which of the following is another way to describe this relationship?

a. There are 5 times as many pentagons as there are sides.
b. There are 5 times as many sides as there are pentagons.
c. Some pentagons will have 5 sides
d. For every 5 pentagons, there will be 5 sides.

2. Josh said, “I have one-fourth as many toys as I have books.” Which of the following describes this relationship?

a. 1 book to 4 toys

b. $\frac{1}{4}$ book to 4 toys

c. 4 books to 1 toy

d. 4 books to $\frac{1}{4}$ toy

3. Which ratio shows 6 times as many tablespoons of cocoa powder as there are cups of milk?

a. $\frac{1}{6}$ to 1, tablespoons of cocoa powder to cups of milk

b. 6 to 1, tablespoons of cocoa powder to cups of milk

c. 1 to 6, tablespoons of cocoa powder to cups of milk

d. 6 to 6, tablespoons of cocoa powder to cups of milk

4. James wrote the ratio 3:9 to compare the number of green beads to the number of blue beads in his bracelet. Which of the following gives two ways to describe this ratio?

a. James has 3 times as many blue beads as he has green beads. He has half as many blue beads as he has green beads.

b. James has 3 times as many green beads as he has blue beads. He has one-third as many blue beads as he has green beads.

c. James has 3 times as many green beads as he has blue beads. He has one-third as many green beads as he has blue beads.

d. James has 3 times as many blue beads as he has green beads. He has one-third as many green beads as he has blue beads.

3. Which ratio shows 6 times as many tablespoons of cocoa powder as there are cups of milk?

a. $\frac{1}{6}$ to 1, tablespoons of cocoa powder to cups of milk

b. 6 to 1, tablespoons of cocoa powder to cups of milk

c. 1 to 6, tablespoons of cocoa powder to cups of milk

d. 6 to 6, tablespoons of cocoa powder to cups of milk

4. James wrote the ratio 3:9 to compare the number of green beads to the number of blue beads in his bracelet. Which of the following gives two ways to describe this ratio?

a. James has 3 times as many blue beads as he has green beads. He has half as many blue beads as he has green beads.

b. James has 3 times as many green beads as he has blue beads. He has one-third as many blue beads as he has green beads.

c. James has 3 times as many green beads as he has blue beads. He has one-third as many green beads as he has blue beads.

d. James has 3 times as many blue beads as he has green beads. He has one-third as many green beads as he has blue beads.

Additional Practice

1. Corey said, "The ratio of 1:5 is equivalent to the ratio of 3:15."
Jim said, "No, those ratios are not equivalent."

Circle the one you agree with. Corey Jim

Draw a diagram using squares and triangles to support your answer.

2. Eli wrote the ratio 1:2 to show the relationship of the number of oranges to the number of apples in her salad. Paula wrote the ratio 3:6 to show the same ratio. Are these ratios equivalent?

a. No, they are not equivalent because 1 + 2 = 3 and 2 + 4 = 6.

b. No, they are not equivalent because Eli's ratio cannot be written as 3:6.

c. Yes, they are equivalent because Paula's ratio is three times as great as Eli's ratio.

d. Yes, they are equivalent because there are the same number of oranges and apples.

Additional Practice

1. Corey said, "The ratio of 1:5 is equivalent to the ratio of 3:15."
Jim said, "No, those ratios are not equivalent."

Circle the one you agree with. Corey Jim

Draw a diagram using squares and triangles to support your answer.

Answers will vary. For example, students may draw 3 triangles and 15 squares to show that there are 3 groups of 1:5.

2. Eli wrote the ratio 1:2 to show the relationship of the number of oranges to the number of apples in her salad. Paula wrote the ratio 3:6 to show the same ratio. Are these ratios equivalent?

a. No, they are not equivalent because 1 + 2 = 3 and 2 + 4 = 6.

b. No, they are not equivalent because Eli's ratio cannot be written as 3:6.

c. Yes, they are equivalent because Paula's ratio is three times as great as Eli's ratio.

d. Yes, they are equivalent because there are the same number of oranges and apples.

3. Kit wrote the ratio 1:5. Which of the following shows the same relationship?

- **a.** 2:6
- **b.** 2:10
- **c.** 5:1
- **d.** 6:10

4. Sam wrote the ratio 8:4. Which of the following shows the same relationship?

- **a.** 1:2
- **b.** 2:1
- **c.** 4:8
- **d.** 2:4

3. Kit wrote the ratio 1:5. Which of the following shows the same relationship?

a. 2:6
b. 2:10
c. 5:1
d. 6:10

4. Sam wrote the ratio 8:4. Which of the following shows the same relationship?

a. 1:2
b. 2:1
c. 4:8
d. 2:4

Additional Practice

1. Abbie made a salad that had 3 apples for every orange. She used 9 apples. How many oranges did she use?

- **a.** 9 oranges
- **b.** 6 oranges
- **c.** 3 oranges
- **d.** 1 orange

2. Carl and Earl made a vegetable salad. For every carrot, they used 3 radishes.

A. If they use 5 carrots, how many radishes will they need to keep it in the same ratio?

B. Write the proportion this represents, using both fraction form and colon form.

C. If they use 7 carrots, how many radishes will they need to keep it in the same ratio? Explain how you decided.

D. Write the proportion this represents, using both fraction form and colon form.

Additional Practice

1. Abbie made a salad that had 3 apples for every orange. She used 9 apples. How many oranges did she use?

a. 9 oranges
b. 6 oranges
c. 3 oranges
d. 1 orange

2. Carl and Earl made a vegetable salad. For every carrot, they used 3 radishes.

A. If they use 5 carrots, how many radishes will they need to keep it in the same ratio?

15 radishes

B. Write the proportion this represents, using both fraction form and colon form.

$\frac{1}{3} = \frac{5}{15}$ or 1:3::5:15

C. If they use 7 carrots, how many radishes will they need to keep it in the same ratio? Explain how you decided.

Answers will vary. For example, students may use a ratio and look for an equivalent fraction. Others may notice that 7 carrots is 7 times the original ratio. Thus they would need 21 radishes.

D. Write the proportion this represents, using both fraction form and colon form.

$\frac{1}{3} = \frac{7}{21}$ or 1:3::7:21

3. Jon made a trail mix. For every cup of almonds, he used 4 cups of carob chips. He used 5 cups of almonds. How many cups of carob chips did he need?

a. 20 cups of carob chips

b. 5 cups of carob chips

c. 9 cups of carob chips

d. 4 cups of carob chips

4. Which of the following shows two equivalent ratios?

a. 1:3 (number of triangles to number of angles) and 2:8 (number of red marbles to total number of marbles)

b. 2:5 (number of books to number of magazines) and 4:10 (number of pens to number of pencils)

c. 1:4 (number of squares to number of sides) and 2:8 (number of red markers to number of black markers)

d. 2:3 (number of bananas to number of pears) and 4:6 (number of bananas to number of pears)

3. Jon made a trail mix. For every cup of almonds, he used 4 cups of carob chips. He used 5 cups of almonds. How many cups of carob chips did he need?

a. 20 cups of carob chips

b. 5 cups of carob chips

c. 9 cups of carob chips

d. 4 cups of carob chips

4. Which of the following shows two equivalent ratios?

a. 1:3 (number of triangles to number of angles) and 2:8 (number of red marbles to total number of marbles)

b. 2:5 (number of books to number of magazines) and 4:10 (number of pens to number of pencils)

c. 1:4 (number of squares to number of sides) and 2:8 (number of red markers to number of black markers)

d. 2:3 (number of bananas to number of pears) and 4:6 (number of bananas to number of pears)

Additional Practice

Pat made a fruit punch. For every 4 cups of pineapple juice, he used 3 cups of orange juice.

1. A. Write the ratio of the number of cups of orange juice to the number of cups of pineapple juice.

B. Pat used 8 cups of pineapple juice. How many cups of orange juice does he need to keep the same ratio?

C. Write the proportion that shows this relationship.

D. Pat used 12 cups of orange juice. How many cups of pineapple juice does he need to keep the same ratio?

E. Write the proportion that shows this relationship.

2. Decide whether the following ratios are equivalent.

A. 4:5 and 12:15	Equivalent	Not Equivalent
B. 3:4 and 5:6	Equivalent	Not Equivalent
C. 5:8 and 15:24	Equivalent	Not Equivalent

Additional Practice

Pat made a fruit punch. For every 4 cups of pineapple juice, he used 3 cups of orange juice.

1. A. Write the ratio of the number of cups of orange juice to the number of cups of pineapple juice.

3:4

B. Pat used 8 cups of pineapple juice. How many cups of orange juice does he need to keep the same ratio?

6 cups of orange juice

C. Write the proportion that shows this relationship.

3:4::6:8 (may use fraction form)

D. Pat used 12 cups of orange juice. How many cups of pineapple juice does he need to keep the same ratio?

16 cups of pineapple juice

E. Write the proportion that shows this relationship.

3:4::12:16 (may use fraction form)

2. Decide whether the following ratios are equivalent.

A. 4:5 and 12:15 Equivalent Not Equivalent

B. 3:4 and 5:6 Equivalent Not Equivalent

C. 5:8 and 15:24 Equivalent Not Equivalent

3. Find the missing value in the proportion: 3:4::x:28

a. 27
b. 7
c. 21
d. 24

4. Find the missing value in the proportion $\frac{2}{7} = \frac{10}{x}$. Use any method. Show your thinking.

3. Find the missing value in the proportion: 3:4::x:28

a. 27

b. 7

c. 21

d. 24

4. Find the missing value in the proportion $\frac{2}{7} = \frac{10}{x}$. Use any method. Show your thinking.

35. Students may use multiple methods, including cross products.

Additional Practice

1. Find the missing value: $\frac{3}{8} = \frac{27}{x}$.

Write the product of 8 and 27. ______

Write the product of 3 and x. ______

Because this is a proportion, the two products are equal. Write the equation.

Find the value of x.

2. Find the missing value: $\frac{2}{3} = \frac{x}{42}$.

Additional Practice

1. Find the missing value: $\frac{3}{8} = \frac{27}{x}$.

Write the product of 8 and 27. 216

Write the product of 3 and x. $3x$

Because this is a proportion, the two products are equal. Write the equation.

$216 = 3x$

Find the value of x.

$x = 72$

2. Find the missing value: $\frac{2}{3} = \frac{x}{42}$.

$x = 28$

3. Find the missing value: $\frac{x}{8} = \frac{7}{56}$.

4. Find the missing value: $\frac{5}{x} = \frac{45}{63}$.

3. Find the missing value: $\frac{x}{8} = \frac{7}{56}$.

$x = 1$

4. Find the missing value: $\frac{5}{x} = \frac{45}{63}$.

$x = 7$

Additional Practice

1. Potatoes sell for \$2.85 for 5 pounds. How much is 1 pound? Show your thinking.

2. Strawberries sell for \$5.88 for 3 boxes. How much is 1 box? Show your thinking.

Additional Practice

1. Potatoes sell for $2.85 for 5 pounds. How much is 1 pound? Show your thinking.

$.57 per pound, unit rate

2. Strawberries sell for $5.88 for 3 boxes. How much is 1 box? Show your thinking.

$1.96 per box, unit rate

3. Sean wanted to buy a can of green beans. They were priced 5 cans for $4.90. What is the unit rate?

a. The unit rate is $4.90:1 because a unit rate is always written with a unit. In this ratio, the unit is 1 group of 5 cans.

b. The unit rate is $0.98:1 because each can of green beans costs $0.98.

c. The unit rate is $4.90:$.98 because the whole group costs $4.90 and 1 can costs $0.98

d. The unit rate is $4.90:5 because the whole group costs $4.90 and each unit is made up of 5 cans.

4. Dylan needed 12 yards of string to make 8 friendship bracelets. What is the unit rate?

a. The unit rate is 12:1 because Dylan wants to make 8 friendship bracelets.

b. The unit rate is 1.50:1 because Dylan will use 1.50 yards for each bracelet.

c. The unit rate is 0.66:1 because Dylan will use 0.66 yards for each bracelet.

d. The unit rate is 3 because Dylan can make 2 bracelets with 12 yards of string.

3. Sean wanted to buy a can of green beans. They were priced 5 cans for \$4.90. What is the unit rate?

a. The unit rate is \$4.90:1 because a unit rate is always written with a unit. In this ratio, the unit is 1 group of 5 cans.

b. The unit rate is \$0.98:1 because each can of green beans costs \$0.98.

c. The unit rate is \$4.90:\$.98 because the whole group costs \$4.90 and 1 can costs \$0.98

d. The unit rate is \$4.90:5 because the whole group costs \$4.90 and each unit is made up of 5 cans.

4. Dylan needed 12 yards of string to make 8 friendship bracelets. What is the unit rate?

a. The unit rate is 12:1 because Dylan wants to make 8 friendship bracelets.

b. The unit rate is 1.50:1 because Dylan will use 1.50 yards for each bracelet.

c. The unit rate is 0.66:1 because Dylan will use 0.66 yards for each bracelet.

d. The unit rate is 3 because Dylan can make 2 bracelets with 12 yards of string.

Additional Practice

1. The unit rate for the number of sides in a table is 4:1. What is the number of sides in 46 tables?

a. 11.5 sides

b. 50 sides

c. 182 sides

d. 184 sides

2. Della is making cookies. The recipe she is using is for 12 cookies. It says that she needs 72 chocolate chips. Find the unit rate that shows the number of chocolate chips she needs for 1 cookie.

a. 550:1

b. 45:1

c. 10:1

d. 6:1

Additional Practice

1. The unit rate for the number of sides in a table is 4:1. What is the number of sides in 46 tables?

a. 11.5 sides

b. 50 sides

c. 182 sides

d. 184 sides

2. Della is making cookies. The recipe she is using is for 12 cookies. It says that she needs 72 chocolate chips. Find the unit rate that shows the number of chocolate chips she needs for 1 cookie.

a. 550:1

b. 45:1

c. 10:1

d. 6:1

Use this information about Louie's shopping trip to solve problems 3 and 4.

Louie went grocery shopping. Tomato sauce was $5.31 for 3 cans. Sparking water was $57 for 15 bottles.

3. What is the cost of 1 can of tomato sauce?

- **a.** $1.77
- **b.** $17.70
- **c.** $2.31
- **d.** $8.31

4. What is the cost of 1 bottle of sparking water?

- **a.** $38
- **b.** $3.80
- **c.** $42
- **d.** $72

Use this information about Louie's shopping trip to solve problems 3 and 4.

Louie went grocery shopping. Tomato sauce was $5.31 for 3 cans. Sparking water was $57 for 15 bottles.

3. What is the cost of 1 can of tomato sauce?

- **a.** $1.77
- **b.** $17.70
- **c.** $2.31
- **d.** $8.31

4. What is the cost of 1 bottle of sparking water?

- **a.** $38
- **b.** $3.80
- **c.** $42
- **d.** $72

Additional Practice

Use the table to answer the questions.

Pounds of peanuts	Pounds of almonds
3	1
4.5	1.5
6	2
15	5
18	6
30	10
33	11

1. If Jully used 9 pounds of peanuts, how many pounds of almonds would she need?

- **a.** She would need 3 pounds of almonds.
- **b.** She would need 6 pounds of almonds.
- **c.** She would need 27 pounds of almonds.
- **d.** She would need 12 pounds of almonds.

Additional Practice

Use the table to answer the questions.

Pounds of peanuts	Pounds of almonds
3	1
4.5	1.5
6	2
15	5
18	6
30	10
33	11

1. If Jully used 9 pounds of peanuts, how many pounds of almonds would she need?

a. She would need 3 pounds of almonds.
b. She would need 6 pounds of almonds.
c. She would need 27 pounds of almonds.
d. She would need 12 pounds of almonds.

2. If Jully used $\frac{1}{3}$ pound of almonds, how many pounds of peanuts would she need?

a. She would need 2 pounds of peanuts.

b. She would need 1 pound of peanuts.

c. She would need $\frac{1}{3}$ pound of peanuts.

d. She would need $\frac{4}{3}$ pounds of peanuts.

3. If Jully used $\frac{1}{5}$ pound of peanuts, how many pounds almonds would she need?

a. She would need 3 pounds of almonds.

b. She would need $\frac{9}{5}$ pounds of almonds.

c. She would need $\frac{1}{15}$ pound of almonds.

d. She would need $\frac{6}{5}$ pounds of almonds.

2. If Jully used $\frac{1}{3}$ pound of almonds, how many pounds of peanuts would she need?

a. She would need 2 pounds of peanuts.

b. She would need 1 pound of peanuts.

c. She would need $\frac{1}{3}$ pound of peanuts.

d. She would need $\frac{4}{3}$ pounds of peanuts.

3. If Jully used $\frac{1}{5}$ pound of peanuts, how many pounds almonds would she need?

a. She would need 3 pounds of almonds.

b. She would need $\frac{9}{5}$ pounds of almonds.

c. She would need $\frac{1}{15}$ pound of almonds.

d. She would need $\frac{6}{5}$ pounds of almonds.

4. How would you describe the relationship between the number of pounds of peanuts and the number of pounds of almonds?

a. As the number of pounds of peanuts increases by 1, the number of pounds of almonds increases by $\frac{1}{2}$.

b. As the number of pounds of almonds increases by 1, the number of pounds of peanuts increases by 3.

c. As the number of pounds of peanuts increases by 1, the number of pounds of almonds increases by 3.

d. As the number of pounds of almonds increases by $\frac{1}{3}$, the number of pounds of peanuts increases by 1.

4. How would you describe the relationship between the number of pounds of peanuts and the number of pounds of almonds?

a. As the number of pounds of peanuts increases by 1, the number of pounds of almonds increases by $\frac{1}{2}$.

b. As the number of pounds of almonds increases by 1, the number of pounds of peanuts increases by 3.

c. As the number of pounds of peanuts increases by 1, the number of pounds of almonds increases by 3.

d. As the number of pounds of almonds increases by $\frac{1}{3}$, the number of pounds of peanuts increases by 1.

Additional Practice

Use the following information to solve problems 1–4.

Santiago and Sofia were making a fruit salad. For every apple they used in the salad, they used 2 kiwis.

1. Which table shows this relationship?

a.

Number of apples	Number of kiwis
3	1
6	2
9	3
12	4

b.

Number of apples	Number of kiwis
1	$\frac{1}{2}$
2	$\frac{2}{2}$
3	$\frac{3}{2}$
4	$\frac{4}{2}$

c.

Number of apples	Number of kiwis
2	1
4	2
6	3
8	4

d.

Number of apples	Number of kiwis
1	2
2	4
3	6
4	8

Additional Practice

Use the following information to solve problems 1–4.

Santiago and Sofia were making a fruit salad. For every apple they used in the salad, they used 2 kiwis.

1. Which table shows this relationship?

a.

Number of apples	Number of kiwis
3	1
6	2
9	3
12	4

b.

Number of apples	Number of kiwis
1	$\frac{1}{2}$
2	$\frac{2}{2}$
3	$\frac{3}{2}$
4	$\frac{4}{2}$

c.

Number of apples	Number of kiwis
2	1
4	2
6	3
8	4

d.

Number of apples	Number of kiwis
1	2
2	4
3	6
4	8

2. Santiago used 3 apples and 30 kiwis. Sofia said, "That's not the right ratio of apples to kiwis." Do you think Sofia is correct?

a. I do not agree with Sofia. The ratio of 1:10 is the same as the ratio of 3:30.

b. I do not agree with Sofia. The unit ratio is 1:2.

c. I agree with Sofia. Santiago should have used more than 30 kiwis to keep the ratio at 1:2.

d. I agree with Sofia. Santiago should have used less than 30 kiwis to keep the ratio at 1:2.

3. Samantha had 36 kiwis to use in the salad. How many apples should she use?

a. 18 apples

b. 12 apples

c. 72 apples

d. 2 apples

2. Santiago used 3 apples and 30 kiwis. Sofia said, "That's not the right ratio of apples to kiwis." Do you think Sofia is correct?

a. I do not agree with Sofia. The ratio of 1:10 is the same as the ratio of 3:30.

b. I do not agree with Sofia. The unit ratio is 1:2.

c. I agree with Sofia. Santiago should have used more than 30 kiwis to keep the ratio at 1:2.

d. I agree with Sofia. Santiago should have used less than 30 kiwis to keep the ratio at 1:2.

3. Samantha had 36 kiwis to use in the salad. How many apples should she use?

a. 18 apples

b. 12 apples

c. 72 apples

d. 2 apples

4. Which of the following proportions would help Santiago determine the number of apples he needs when he uses 46 kiwis?

a. $\frac{1}{2} = \frac{46}{x}$

b. $\frac{1}{2} = \frac{x}{46}$

c. $\frac{2}{1} = \frac{x}{46}$

d. $\frac{46}{2} = \frac{1}{x}$

4. Which of the following proportions would help Santiago determine the number of apples he needs when he uses 46 kiwis?

a. $\frac{1}{2} = \frac{46}{x}$

b. $\frac{1}{2} = \frac{x}{46}$

c. $\frac{2}{1} = \frac{x}{46}$

d. $\frac{46}{2} = \frac{1}{x}$

Additional Practice

Use the tables to solve problems 1–4.

Jenny and Wilson each made a table to show the ratio of the number of apples to the number of carrots to make smoothies.

Jenny's Table	
Number of apples	**Number of carrots**
2	5
3	7.5
5	12.5
10	25

Wilson's Table	
Number of apples	**Number of carrots**
4	10
6	15
8	20
12	30

1. Do Jenny's table and Wilson's table represent the same ratio?

a. Yes, they represent the same ratio because they both have a unit rate of 1:5 of the number of apples to number of carrots.

b. No, they do not represent the same ratio because Jenny's table has decimals in it.

c. Yes, they represent the same ratio because they both have a unit rate of 1:2.5 of the number of apples to number of carrots.

d. No, they do not represent the same ratio because in Wilson's table, the number of apples does not increase by the same amount in each row.

2. If Wilson used 20 apples, how many carrots would he need?

a. He would need 8 carrots.

b. He would need 25 carrots.

c. He would need 40 carrots.

d. He would need 50 carrots.

1. Do Jenny's table and Wilson's table represent the same ratio?

a. Yes, they represent the same ratio because they both have a unit rate of 1:5 of the number of apples to number of carrots.

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d. No, they do not represent the same ratio because in Wilson's table, the number of apples does not increase by the same amount in each row.

2. If Wilson used 20 apples, how many carrots would he need?

a. He would need 8 carrots.

b. He would need 25 carrots.

c. He would need 40 carrots.

d. He would need 50 carrots.

3. If Jenny used 60 carrots, how many apples would she need?

a. She would need 20 apples.

b. She would need 24 apples.

c. She would need 120 apples.

d. She would need 150 apples.

4. Megan made a different mixture of apples and carrots. She used 6 carrots for every 3 apples. Would her mixture have more carrot flavor than Jenny's smoothies?

a. No, Jenny's smoothies would have more carrot flavor because the unit rate for Megan is 1 apple to 2 carrots.

b. No, because the unit rate for Jenny's smoothies and Megan's smoothies is the same.

c. Yes, Megan's smoothies would have more carrot flavor because she is using 6 carrots for every 3 apples.

d. Yes, Megan's smoothies would have more carrot flavor because her unit rate of apples to carrots is 1:2.5. So for every apple, she used 2.5 carrots.

3. If Jenny used 60 carrots, how many apples would she need?

a. She would need 20 apples.
b. She would need 24 apples.
c. She would need 120 apples.
d. She would need 150 apples.

4. Megan made a different mixture of apples and carrots. She used 6 carrots for every 3 apples. Would her mixture have more carrot flavor than Jenny's smoothies?

a. No, Jenny's smoothies would have more carrot flavor because the unit rate for Megan is 1 apple to 2 carrots.
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c. Yes, Megan's smoothies would have more carrot flavor because she is using 6 carrots for every 3 apples.
d. Yes, Megan's smoothies would have more carrot flavor because her unit rate of apples to carrots is 1:2.5. So for every apple, she used 2.5 carrots.

Additional Practice

1. The number of wheels increases by 4 as the number of cars increases by 1. Which gives the dependent and independent variables?

> **a.** The independent variable is the number of wheels; the dependent variable is the number of cars.
>
> **b.** The independent variable is the number of cars; the dependent variable is 1.
>
> **c.** The independent variable is the number of cars; the dependent variable is the number of wheels.
>
> **d.** The independent and dependent variables are the same because the ratio is 1:1.

2. Mary spent 50 minutes to make 10 donuts. The more donuts she makes, the more time she spends. Which identifies the dependent and independent variables?

> **a.** The independent variable is the number of donuts she makes; the dependent variable is the amount of time she spends on making donuts.
>
> **b.** The independent variable is the ingredients Mary uses; the dependent variable is the kind of donuts she makes.
>
> **c.** The independent variable is the kind of donuts she makes; the dependent variable is the amount of time she spends on making donuts.
>
> **d.** The independent variable is the amount of time she spends on making donuts; the dependent variable is the number of donuts she makes.

Additional Practice

1. The number of wheels increases by 4 as the number of cars increases by 1. Which gives the dependent and independent variables?

a. The independent variable is the number of wheels; the dependent variable is the number of cars.

b. The independent variable is the number of cars; the dependent variable is 1.

c. The independent variable is the number of cars; the dependent variable is the number of wheels.

d. The independent and dependent variables are the same because the ratio is 1:1.

2. Mary spent 50 minutes to make 10 donuts. The more donuts she makes, the more time she spends. Which identifies the dependent and independent variables?

a. The independent variable is the number of donuts she makes; the dependent variable is the amount of time she spends on making donuts.

b. The independent variable is the ingredients Mary uses; the dependent variable is the kind of donuts she makes.

c. The independent variable is the kind of donuts she makes; the dependent variable is the amount of time she spends on making donuts.

d. The independent variable is the amount of time she spends on making donuts; the dependent variable is the number of donuts she makes.

3. Mia said, "The more I use electricity, the more I need to pay for the electricity bill." Which gives the independent and dependent variables?

a. The independent variable is the kind of appliance she uses; the dependent variable is the amount of electricity that Mia uses.

b. The independent variable is the amount of electricity that Mia uses; the dependent variable is the amount of money she pays for her electricity bill.

c. The independent variable the amount of electricity that Mia uses; the dependent variable is the number of appliances she uses.

d. The independent variable is the number of appliances she uses; the dependent variable is the amount of money she pays for her electricity bill.

4. James drove a car to travel. The distance traveled increased by 40 miles as the time increased by 1 hour. Which gives the independent and dependent variables?

a. The independent variable is the number of places where he visited; the dependent variable is the number of hours he drove.

b. The independent variable is the number of miles traveled; the dependent variable is the number of places he visited.

c. The independent variable is the number of miles traveled; the dependent variable is the number of hours he drove.

d. The independent variable is the number of hours he drove; the dependent variable is the number of miles traveled.

3. Mia said, "The more I use electricity, the more I need to pay for the electricity bill." Which gives the independent and dependent variables?

a. The independent variable is the kind of appliance she uses; the dependent variable is the amount of electricity that Mia uses.

b. The independent variable is the amount of electricity that Mia uses; the dependent variable is the amount of money she pays for her electricity bill.

c. The independent variable the amount of electricity that Mia uses; the dependent variable is the number of appliances she uses.

d. The independent variable is the number of appliances she uses; the dependent variable is the amount of money she pays for her electricity bill.

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a. The independent variable is the number of places where he visited; the dependent variable is the number of hours he drove.

b. The independent variable is the number of miles traveled; the dependent variable is the number of places he visited.

c. The independent variable is the number of miles traveled; the dependent variable is the number of hours he drove.

d. The independent variable is the number of hours he drove; the dependent variable is the number of miles traveled.

Additional Practice

1. Henry realized that the more he walked, the more time he spent walking. What are the dependent and independent variables?

a. The independent variable is the amount of time he spent; the dependent variable is the number of miles he walked.

b. The independent variable is the number of miles he walked; the dependent variable is the amount of time he spent.

c. The independent variable is the amount of time he spent; the dependent variable is the number of places he visited.

d. The independent variable is the kinds of places he visited; the dependent variable is the amount of time he spent.

2. Jimmy was making toy houses. It takes 30 minutes for him to make 1 toy house. What are the dependent and independent variables?

a. The independent variable is the amount of time that he spent; the dependent variable is the number of toy houses he made.

b. The independent variable is the number of toy houses he made; the dependent variable is the amount of time that he spent.

c. The independent variable is the amount of time that he spent; the dependent variable is the kinds of toy houses he made.

d. The independent variable is the kinds of toy houses he made; the dependent variable is the number of toy houses he made.

Additional Practice

1. Henry realized that the more he walked, the more time he spent walking. What are the dependent and independent variables?

a. The independent variable is the amount of time he spent; the dependent variable is the number of miles he walked.

b. The independent variable is the number of miles he walked; the dependent variable is the amount of time he spent.

c. The independent variable is the amount of time he spent; the dependent variable is the number of places he visited.

d. The independent variable is the kinds of places he visited; the dependent variable is the amount of time he spent.

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b. The independent variable is the number of toy houses he made; the dependent variable is the amount of time that he spent.

c. The independent variable is the amount of time that he spent; the dependent variable is the kinds of toy houses he made.

d. The independent variable is the kinds of toy houses he made; the dependent variable is the number of toy houses he made.

3. Allie was making friendship necklaces. Each necklace uses 3 yards of silver chains. What are the dependent and independent variables?

a. The independent variable is the number of yards of silver chains; the dependent variable is the number of necklaces she made.

b. The independent variable is the number of necklaces she made; the dependent variable is the color of silver chains she used.

c. The independent variable is the number of necklaces she made; the dependent variable is the number of yards of silver chains.

d. The independent variable is the number of yards of silver chains; the dependent variable is the length of the necklaces.

4. Madison can run a mile in 10 minutes. What are the independent and dependent variables?

a. The independent variable is the number of steps that she took; the dependent variable is the amount of time she ran.

b. The independent variable is the amount of time she ran; the dependent variable is the number of miles she ran.

c. The independent variable is the number of miles she ran; the dependent variable is the amount of time she ran.

d. The independent variable is the amount of time she ran; the dependent variable is the number of steps that she took.

3. Allie was making friendship necklaces. Each necklace uses 3 yards of silver chains. What are the dependent and independent variables?

a. The independent variable is the number of yards of silver chains; the dependent variable is the number of necklaces she made.

b. The independent variable is the number of necklaces she made; the dependent variable is the color of silver chains she used.

c. The independent variable is the number of necklaces she made; the dependent variable is the number of yards of silver chains.

d. The independent variable is the number of yards of silver chains; the dependent variable is the length of the necklaces.

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b. The independent variable is the amount of time she ran; the dependent variable is the number of miles she ran.

c. The independent variable is the number of miles she ran; the dependent variable is the amount of time she ran.

d. The independent variable is the amount of time she ran; the dependent variable is the number of steps that she took.

Additional Practice

1. Katy made a table to show the relationship between the number of socks knitted and the number of yards of yarn used. What is the generalization or rule that describes the amount of yarn needed?

Number of socks knitted (x)	Number of yards of yarn used
1	20
2	40
3	60
4	80
5	100
10	200
30	600
x	??

a. $20x$ because for every sock, it takes 20 yards of yarn.
b. $30x$ because for 3 socks, it takes 10 yards of yarn.
c. $40x$ because for 4 socks, it takes 10 yards of yarn.
d. $10x$ because for 2 socks, it takes 20 yards of yarn.

Additional Practice

1. Katy made a table to show the relationship between the number of socks knitted and the number of yards of yarn used. What is the generalization or rule that describes the amount of yarn needed?

Number of socks knitted (*x*)	Number of yards of yarn used
1	20
2	40
3	60
4	80
5	100
10	200
30	600
x	??

a. 20*x* because for every sock, it takes 20 yards of yarn.
b. 30*x* because for 3 socks, it takes 10 yards of yarn.
c. 40*x* because for 4 socks, it takes 10 yards of yarn.
d. 10*x* because for 2 socks, it takes 20 yards of yarn

2. Ted had his father time him when he completes quizzes. He made a table. What is the generalization that describes the amount of time it takes him to complete quiz problems?

Number of quiz problems (*m*)	**Number of minutes to complete**
1	1.5
2	3
3	4.5
4	6
5	7.5
10	15
20	30
m	??

a. 1*m* because *m* represents the number of quiz problems.
b. 3*m* because it takes 4.5 minutes to solve 3 problems.
c. 1.5*m* because each quiz problem takes 1.5 minutes to solve.
d. 10*m* because it takes 15 minutes to solve 10 problems.

2. Ted had his father time him when he completes quizzes. He made a table. What is the generalization that describes the amount of time it takes him to complete quiz problems?

Number of quiz problems (*m*)	**Number of minutes to complete**
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2	3
3	4.5
4	6
5	7.5
10	15
20	30
m	??

a. 1*m* because *m* represents the number of quiz problems.
b. 3*m* because it takes 4.5 minutes to solve 3 problems.
c. 1.5*m* because each quiz problem takes 1.5 minutes to solve.
d. 10*m* because it takes 15 minutes to solve 10 problems.

3. Ryan made a mixture of milk and strawberry syrup. He created a table to show how much strawberry syrup to use with a certain number of cups of milk. He said, "I can write 2.5*y* as a rule for my table." What does 2.5*y* tell you?

Number of cups of milk (y)	Number of tablespoons of strawberry syrup
1	2.5
2	5
3	7.5
4	10
5	12.5
12	30
15	37.5

a. 2.5*y* means that for any number of tablespoons of strawberry syrup (*y*), it takes 2.5 times as much milk.

b. 2.5*y* means that for any number of cups of milk (*y*), it takes 2.5 times as many tablespoons of strawberry syrup.

c. 2.5*y* means that for 1 cup of strawberry syrup, you have to use 2.5 times as much milk.

d. 2.5*y* means that for 2.5 tablespoons of strawberry syrup, you have to use 2.5 times as much milk.

3. Ryan made a mixture of milk and strawberry syrup. He created a table to show how much strawberry syrup to use with a certain number of cups of milk. He said, "I can write 2.5*y* as a rule for my table." What does 2.5*y* tell you?

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b. 2.5*y* means that for any number of cups of milk (*y*), it takes 2.5 times as many tablespoons of strawberry syrup.

c. 2.5*y* means that for 1 cup of strawberry syrup, you have to use 2.5 times as much milk.

d. 2.5*y* means that for 2.5 tablespoons of strawberry syrup, you have to use 2.5 times as much milk.

4. Holly said, "For any number of apples (k) in my salad, I have to use one-fourth as many cups of coconut flakes." Which represents the amount of coconut flakes needed in the salad?

a. $4k$ because multiplying by 4 is the inverse of dividing by one-fourth.

b. $k + 4$ because adding 4 is the same as multiplying by one-fourth.

c. $3k$ because I need 4 times as many apples.

d. $\frac{1}{4}k$ because multiplying by one-fourth means there are 4 times as many apples.

4. Holly said, "For any number of apples (k) in my salad, I have to use one-fourth as many cups of coconut flakes." Which represents the amount of coconut flakes needed in the salad?

a. $4k$ because multiplying by 4 is the inverse of dividing by one-fourth.

b. $k + 4$ because adding 4 is the same as multiplying by one-fourth.

c. $3k$ because I need 4 times as many apples.

d. $\frac{1}{4}k$ because multiplying by one-fourth means there are 4 times as many apples.

Additional Practice

Each banner that Marty made required 3 quarts of paint. Her table is below. Use this information to solve problems 1 and 2.

Number of banners	Number of quarts of paint
1	3
2	6
3	9
4	12
5	15
10	30
20	60
x	$3x$

1. Which describes the independent and dependent variables?

a. The independent variable is the number of banners (x); the dependent variable is $3x$.

b. The independent variable is the number of quarts of paint; the dependent variable is the number of banners.

c. The independent variable is the number of banners ($3x$); the dependent variable is x.

d. The independent variable is the number of quarts of paint (x); the dependent variable is $3x$.

Additional Practice

Each banner that Marty made required 3 quarts of paint. Her table is below. Use this information to solve problems 1 and 2.

Number of banners	**Number of quarts of paint**
1	3
2	6
3	9
4	12
5	15
10	30
20	60
x	3*x*

1. Which describes the independent and dependent variables?

a. The independent variable is the number of banners (x); the dependent variable is 3*x*.

b. The independent variable is the number of quarts of paint; the dependent variable is the number of banners.

c. The independent variable is the number of banners (3*x*); the dependent variable is *x*.

d. The independent variable is the number of quarts of paint (*x*); the dependent variable is 3*x*.

2. Marty used 39 quarts of paint. How many banners did she paint?

- **a.** She painted 42 banners.
- **b.** She painted 36 banners.
- **c.** She painted 13 banners.
- **d.** She painted 117 banners.

Teman went to the grocery store to buy a salad at the salad bar. The store charges \$7.99 per half-pound of salad. Use this information to solve problems 3 and 4.

3. How much would Teman pay for $2\frac{1}{2}$ pounds of salad?

- **a.** \$39.95
- **b.** \$31.96
- **c.** \$19.97
- **d.** \$15.98

2. Marty used 39 quarts of paint. How many banners did she paint?

- **a.** She painted 42 banners.
- **b.** She painted 36 banners.
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3. How much would Teman pay for $2\frac{1}{2}$ pounds of salad?

- **a.** $39.95
- **b.** $31.96
- **c.** $19.97
- **d.** $15.98

4. If the amount of salad in pounds is the independent variable *p*, which of the following describes the dependent variable?

- **a.** $7.99p$ because you multiply the amount of salad by the cost per half-pound.
- **b.** $7.99p + 2$ because the amount of salad is in pounds so you have to double the amount.
- **c.** $7.99p \div 2$ because the amount of salad is in pounds so you have to divide by 2.
- **d.** $(2 \times 7.99)p$ because price is given per half pound so you have to double it.

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a. $7.99p$ because you multiply the amount of salad by the cost per half-pound.

b. $7.99p + 2$ because the amount of salad is in pounds so you have to double the amount.

c. $7.99p \div 2$ because the amount of salad is in pounds so you have to divide by 2.

d. $(2 \times 7.99)p$ because price is given per half pound so you have to double it.

Multiplication and Division

Timed Practice

The Meadows Center for Preventing Educational Risk—Mathematics Institute
The University of Texas at Austin

Multiplication and Division Facts: *Information*

Timed Fact Practice

Timed Fact Practice is a component of each module for students to practice developing automaticity with the facts. Research recommends that students spend about 10 minutes a day practicing facts to build automaticity. Three sets of facts are provided: Multiplication, Division, and Mixed Facts.

Content

This module contains 10 multiplication fact practice sheets, 10 division fact practice sheets, and 10 mixed fact practice sheets; answers are also included. The same set of facts must be used for the duration of the module to provide accurate data on students' progress.

Graphing

Have students practice the multiplication facts for 5 days (sheets 1 – 5; there are extra sheets if more practice is needed). Give students 1 minute to complete one sheet of 20 problems. Then, display the answers for the sheet and have students correct their work and put the number correct at the top of the sheet. Have students use the Facts Practice Graph to plot their number correct on each practice sheet. Repeat this procedure for division facts and then for mixed facts. Students can plot their number correct for each operation across 15 days: 5 days for multiplication, 5 days for division, and 5 days for mixed facts.

Motivation and Self-Regulation

By the middle grades, students with chronically low mathematics performance benefit from motivational strategies to keep them interested in learning or relearning mathematical ideas. Self-regulation, such as monitoring one's own performance, can be a powerful strategy for improving motivation for learning. Having students chart their own performance is a motivational strategy that can help to improve their mathematics performance.

Multiplication and Division Facts: *Common Misconceptions and How to Prevent Them*

Misconceptions	Examples for Preventing or Correcting
Some students believe repeated addition is the only definition of multiplication.	Teach students that repeated addition is only 1 way to represent multiplication. Explain to students that if A and B are nonnegative numbers, then $A \times B$ is the total of A groups of B.[1]
Some students universally believe multiplication can be used when adding groups.	Teach students that repeated addition of the same number of objects is 1 way of thinking of multiplication. Teach students that multiplication cannot be used when the number of objects in each group is not the same. Present examples and nonexamples (e.g., $5 + 5 + 5$, $4 + 5 + 3$). Demonstrate and have students differentiate between equal and unequal groups as well as identify when multiplication can and cannot be used.[3]
Some students believe that 4×3 and 3×4 have different answers.	Illustrate the commutative property of multiplication, using array models to prove the total (product) is the same.[2]
Some students may believe that $30 = 5 \times 6$ is written incorrectly because the product (30) must follow the equal sign.	Teach students the meaning of the equal sign and explain that the equal sign means "equals" or "is equal to" and that the expressions on each side of the equal sign have the same value.[2]
Some students do not connect the rows with the columns in a multiplication table.	Draw attention to the row as each column is completed. Provide additional instruction on the commutative property of multiplication and the multiplication table's design as needed.
Some students believe that performing a strategy, such as doubling, changes the total number in the array.	Teach students that the doubling strategy changes how the arrays look but not the total number. Use visualizations and manipulatives as needed.
Students may assume that the commutative property also holds for division—for example, assuming that $15 \div 3 = 5$, so $3 \div 15 = 5$.	Demonstrate an example, such as the following. Have 15 sheets of paper to share among 3 people. Ask students, "How many sheets of paper does each person get?" (5) Have 3 sheets of paper to share among 15 people. Ask students, "How many sheets of paper does each person get?" ($\frac{1}{5}$) For each demonstration, write the equation on the board. Draw attention to the quotients, which are different.

Some students may confuse fact families with the set of a number and all its factors (12: 1, 2, 3, 4, 6, 12).	Teach students that a family of facts consists of 3 numbers, 2 of which are the factors that when multiplied equal the product.
Some students may believe a family of facts consists of any 2 factors of a product and the product.	Emphasize that the equation constructed with these numbers must be true. For example, if students offer 5, 10, and 20, ask what the equation is ($5 \times 10 = 20$) and whether it is true.
Some students may need a more concrete model showing how multiplying by powers of 10 works.	If so, use base-ten blocks to show 10, 100, and 1,000, as well as 20, 200, and 2,000. Show students how, in each place, the number in the second group is 2 times larger than the number in the first group: 2 is 2 times larger than 1, 20 is 2 times larger than 10, etc. The factor is always 2, and the number of 0s represents the other factor: 10, 100, or 1,000.

1. Beckman, S. (2011). *Mathematics for elementary teachers with activity manual* (3rd ed.). Boston, MA: Addison-Wesley.

2. National Council of Teachers of Mathematics. (2009). *Focus in grade 3: Teaching with curriculum focal points.* Reston, VA: Author.

3. Scott Foresman & Addison Wesley. (2009). *enVision math Texas: Grade 5*. Glenview: IL: Pearson Education.

Name: ______________________________

Multiplication Timed Practice Sheet 1

Number Correct: ______

1 $\begin{array}{r} 8 \\ \times\ 2 \\ \hline \end{array}$	**2** $\begin{array}{r} 1 \\ \times\ 7 \\ \hline \end{array}$	**3** $\begin{array}{r} 5 \\ \times\ 8 \\ \hline \end{array}$	**4** $\begin{array}{r} 6 \\ \times\ 3 \\ \hline \end{array}$
5 $\begin{array}{r} 7 \\ \times\ 4 \\ \hline \end{array}$	**6** $\begin{array}{r} 6 \\ \times\ 6 \\ \hline \end{array}$	**7** $\begin{array}{r} 2 \\ \times\ 12 \\ \hline \end{array}$	**8** $\begin{array}{r} 4 \\ \times\ 5 \\ \hline \end{array}$
9 $\begin{array}{r} 7 \\ \times\ 6 \\ \hline \end{array}$	**10** $\begin{array}{r} 3 \\ \times\ 9 \\ \hline \end{array}$	**11** $\begin{array}{r} 11 \\ \times\ 5 \\ \hline \end{array}$	**12** $\begin{array}{r} 3 \\ \times\ 3 \\ \hline \end{array}$
13 $\begin{array}{r} 8 \\ \times\ 9 \\ \hline \end{array}$	**14** $\begin{array}{r} 2 \\ \times\ 4 \\ \hline \end{array}$	**15** $\begin{array}{r} 6 \\ \times\ 9 \\ \hline \end{array}$	**16** $\begin{array}{r} 4 \\ \times\ 12 \\ \hline \end{array}$
17 $\begin{array}{r} 9 \\ \times\ 6 \\ \hline \end{array}$	**18** $\begin{array}{r} 10 \\ \times\ 8 \\ \hline \end{array}$	**19** $\begin{array}{r} 2 \\ \times\ 9 \\ \hline \end{array}$	**20** $\begin{array}{r} 8 \\ \times\ 3 \\ \hline \end{array}$

Multiplication Timed Practice Sheet 1

1 $\begin{array}{r} 8 \\ \times\ 2 \\ \hline 16 \end{array}$

2 $\begin{array}{r} 1 \\ \times\ 7 \\ \hline 7 \end{array}$

3 $\begin{array}{r} 5 \\ \times\ 8 \\ \hline 40 \end{array}$

4 $\begin{array}{r} 6 \\ \times\ 3 \\ \hline 18 \end{array}$

5 $\begin{array}{r} 7 \\ \times\ 4 \\ \hline 28 \end{array}$

6 $\begin{array}{r} 6 \\ \times\ 6 \\ \hline 36 \end{array}$

7 $\begin{array}{r} 2 \\ \times\ 12 \\ \hline 24 \end{array}$

8 $\begin{array}{r} 4 \\ \times\ 5 \\ \hline 20 \end{array}$

9 $\begin{array}{r} 7 \\ \times\ 6 \\ \hline 42 \end{array}$

10 $\begin{array}{r} 3 \\ \times\ 9 \\ \hline 27 \end{array}$

11 $\begin{array}{r} 11 \\ \times\ 5 \\ \hline 55 \end{array}$

12 $\begin{array}{r} 3 \\ \times\ 3 \\ \hline 9 \end{array}$

13 $\begin{array}{r} 8 \\ \times\ 9 \\ \hline 72 \end{array}$

14 $\begin{array}{r} 2 \\ \times\ 4 \\ \hline 8 \end{array}$

15 $\begin{array}{r} 6 \\ \times\ 9 \\ \hline 54 \end{array}$

16 $\begin{array}{r} 4 \\ \times\ 12 \\ \hline 48 \end{array}$

17 $\begin{array}{r} 9 \\ \times\ 6 \\ \hline 54 \end{array}$

18 $\begin{array}{r} 10 \\ \times\ 8 \\ \hline 80 \end{array}$

19 $\begin{array}{r} 2 \\ \times\ 9 \\ \hline 18 \end{array}$

20 $\begin{array}{r} 8 \\ \times\ 3 \\ \hline 24 \end{array}$

Name: ______________________________

Multiplication Timed Practice Sheet 2

Number Correct: ______

1 7×2	**2** 5×5	**3** 9×1	**4** 7×11
5 5×6	**6** 10×3	**7** 7×5	**8** 3×4
9 4×9	**10** 4×7	**11** 12×6	**12** 7×8
13 7×10	**14** 8×6	**15** 6×7	**16** 5×3
17 9×8	**18** 6×4	**19** 9×4	**20** 8×4

Multiplication Timed Practice Sheet 2

1
$$\begin{array}{r} 7 \\ \times\ 2 \\ \hline 14 \end{array}$$

2
$$\begin{array}{r} 5 \\ \times\ 5 \\ \hline 25 \end{array}$$

3
$$\begin{array}{r} 9 \\ \times\ 1 \\ \hline 9 \end{array}$$

4
$$\begin{array}{r} 7 \\ \times\ 11 \\ \hline 77 \end{array}$$

5
$$\begin{array}{r} 5 \\ \times\ 6 \\ \hline 30 \end{array}$$

6
$$\begin{array}{r} 10 \\ \times\ 3 \\ \hline 30 \end{array}$$

7
$$\begin{array}{r} 7 \\ \times\ 5 \\ \hline 35 \end{array}$$

8
$$\begin{array}{r} 3 \\ \times\ 4 \\ \hline 12 \end{array}$$

9
$$\begin{array}{r} 4 \\ \times\ 9 \\ \hline 36 \end{array}$$

10
$$\begin{array}{r} 4 \\ \times\ 7 \\ \hline 28 \end{array}$$

11
$$\begin{array}{r} 12 \\ \times\ 6 \\ \hline 72 \end{array}$$

12
$$\begin{array}{r} 7 \\ \times\ 8 \\ \hline 56 \end{array}$$

13
$$\begin{array}{r} 7 \\ \times\ 10 \\ \hline 70 \end{array}$$

14
$$\begin{array}{r} 8 \\ \times\ 6 \\ \hline 48 \end{array}$$

15
$$\begin{array}{r} 6 \\ \times\ 7 \\ \hline 42 \end{array}$$

16
$$\begin{array}{r} 5 \\ \times\ 3 \\ \hline 15 \end{array}$$

17
$$\begin{array}{r} 9 \\ \times\ 8 \\ \hline 72 \end{array}$$

18
$$\begin{array}{r} 6 \\ \times\ 4 \\ \hline 24 \end{array}$$

19
$$\begin{array}{r} 9 \\ \times\ 4 \\ \hline 36 \end{array}$$

20
$$\begin{array}{r} 8 \\ \times\ 4 \\ \hline 32 \end{array}$$

Name: ____________________

Multiplication Timed Practice Sheet 3

Number Correct: ______

1 1×12

2 4×3

3 5×2

4 10×7

5 10×2

6 4×8

7 3×7

8 12×7

9 11×6

10 3×12

11 4×6

12 5×9

13 8×7

14 7×3

15 8×8

16 5×10

17 5×4

18 9×2

19 3×11

20 9×7

Multiplication Timed Practice Sheet 3

1 $\begin{array}{r} 1 \\ \times\ 12 \\ \hline 12 \end{array}$	**2** $\begin{array}{r} 4 \\ \times\ 3 \\ \hline 12 \end{array}$	**3** $\begin{array}{r} 5 \\ \times\ 2 \\ \hline 10 \end{array}$	**4** $\begin{array}{r} 10 \\ \times\ 7 \\ \hline 70 \end{array}$
5 $\begin{array}{r} 10 \\ \times\ 2 \\ \hline 20 \end{array}$	**6** $\begin{array}{r} 4 \\ \times\ 8 \\ \hline 32 \end{array}$	**7** $\begin{array}{r} 3 \\ \times\ 7 \\ \hline 21 \end{array}$	**8** $\begin{array}{r} 12 \\ \times\ 7 \\ \hline 84 \end{array}$
9 $\begin{array}{r} 11 \\ \times\ 6 \\ \hline 66 \end{array}$	**10** $\begin{array}{r} 3 \\ \times\ 12 \\ \hline 36 \end{array}$	**11** $\begin{array}{r} 4 \\ \times\ 6 \\ \hline 24 \end{array}$	**12** $\begin{array}{r} 5 \\ \times\ 9 \\ \hline 45 \end{array}$
13 $\begin{array}{r} 8 \\ \times\ 7 \\ \hline 56 \end{array}$	**14** $\begin{array}{r} 7 \\ \times\ 3 \\ \hline 21 \end{array}$	**15** $\begin{array}{r} 8 \\ \times\ 8 \\ \hline 64 \end{array}$	**16** $\begin{array}{r} 5 \\ \times\ 10 \\ \hline 50 \end{array}$
17 $\begin{array}{r} 5 \\ \times\ 4 \\ \hline 20 \end{array}$	**18** $\begin{array}{r} 9 \\ \times\ 2 \\ \hline 18 \end{array}$	**19** $\begin{array}{r} 3 \\ \times\ 11 \\ \hline 33 \end{array}$	**20** $\begin{array}{r} 9 \\ \times\ 7 \\ \hline 63 \end{array}$

Name: ______________________________

Multiplication Timed Practice Sheet 4

Number Correct: ______

1 2×8	**2** 3×6	**3** 8×5	**4** 2×7
5 11×9	**6** 4×4	**7** 9×4	**8** 3×10
9 5×9	**10** 5×12	**11** 7×3	**12** 1×5
13 3×2	**14** 6×8	**15** 9×11	**16** 4×5
17 12×5	**18** 4×2	**19** 7×7	**20** 10×10

Multiplication Timed Practice Sheet 4

1 $\begin{array}{r} 2 \\ \times\ 8 \\ \hline 16 \end{array}$	**2** $\begin{array}{r} 3 \\ \times\ 6 \\ \hline 18 \end{array}$	**3** $\begin{array}{r} 8 \\ \times\ 5 \\ \hline 40 \end{array}$	**4** $\begin{array}{r} 2 \\ \times\ 7 \\ \hline 14 \end{array}$
5 $\begin{array}{r} 11 \\ \times\ 9 \\ \hline 99 \end{array}$	**6** $\begin{array}{r} 4 \\ \times\ 4 \\ \hline 16 \end{array}$	**7** $\begin{array}{r} 9 \\ \times\ 4 \\ \hline 36 \end{array}$	**8** $\begin{array}{r} 3 \\ \times\ 10 \\ \hline 30 \end{array}$
9 $\begin{array}{r} 5 \\ \times\ 9 \\ \hline 45 \end{array}$	**10** $\begin{array}{r} 5 \\ \times\ 12 \\ \hline 60 \end{array}$	**11** $\begin{array}{r} 7 \\ \times\ 3 \\ \hline 21 \end{array}$	**12** $\begin{array}{r} 1 \\ \times\ 5 \\ \hline 5 \end{array}$
13 $\begin{array}{r} 3 \\ \times\ 2 \\ \hline 6 \end{array}$	**14** $\begin{array}{r} 6 \\ \times\ 8 \\ \hline 48 \end{array}$	**15** $\begin{array}{r} 9 \\ \times\ 11 \\ \hline 99 \end{array}$	**16** $\begin{array}{r} 4 \\ \times\ 5 \\ \hline 20 \end{array}$
17 $\begin{array}{r} 12 \\ \times\ 5 \\ \hline 60 \end{array}$	**18** $\begin{array}{r} 4 \\ \times\ 2 \\ \hline 8 \end{array}$	**19** $\begin{array}{r} 7 \\ \times\ 7 \\ \hline 49 \end{array}$	**20** $\begin{array}{r} 10 \\ \times\ 10 \\ \hline 100 \end{array}$

Name: ______________________________

Multiplication Timed Practice Sheet 5

Number Correct: ______

1 4×6	**2** 9×3	**3** 5×11	**4** 10×5
5 5×7	**6** 2×10	**7** 3×1	**8** 12×5
9 8×6	**10** 6×12	**11** 6×2	**12** 7×7
13 4×7	**14** 5×3	**15** 3×8	**16** 12×2
17 9×3	**18** 11×4	**19** 7×4	**20** 9×10

Multiplication Timed Practice Sheet 5

1 $\begin{array}{r} 4 \\ \times\ 6 \\ \hline 24 \end{array}$

2 $\begin{array}{r} 9 \\ \times\ 3 \\ \hline 27 \end{array}$

3 $\begin{array}{r} 5 \\ \times\ 11 \\ \hline 55 \end{array}$

4 $\begin{array}{r} 10 \\ \times\ 5 \\ \hline 50 \end{array}$

5 $\begin{array}{r} 5 \\ \times\ 7 \\ \hline 35 \end{array}$

6 $\begin{array}{r} 2 \\ \times\ 10 \\ \hline 20 \end{array}$

7 $\begin{array}{r} 3 \\ \times\ 1 \\ \hline 3 \end{array}$

8 $\begin{array}{r} 12 \\ \times\ 5 \\ \hline 60 \end{array}$

9 $\begin{array}{r} 8 \\ \times\ 6 \\ \hline 48 \end{array}$

10 $\begin{array}{r} 6 \\ \times\ 12 \\ \hline 72 \end{array}$

11 $\begin{array}{r} 6 \\ \times\ 2 \\ \hline 12 \end{array}$

12 $\begin{array}{r} 7 \\ \times\ 7 \\ \hline 49 \end{array}$

13 $\begin{array}{r} 4 \\ \times\ 7 \\ \hline 28 \end{array}$

14 $\begin{array}{r} 5 \\ \times\ 3 \\ \hline 15 \end{array}$

15 $\begin{array}{r} 3 \\ \times\ 8 \\ \hline 24 \end{array}$

16 $\begin{array}{r} 12 \\ \times\ 2 \\ \hline 24 \end{array}$

17 $\begin{array}{r} 9 \\ \times\ 3 \\ \hline 27 \end{array}$

18 $\begin{array}{r} 11 \\ \times\ 4 \\ \hline 44 \end{array}$

19 $\begin{array}{r} 7 \\ \times\ 4 \\ \hline 28 \end{array}$

20 $\begin{array}{r} 9 \\ \times\ 10 \\ \hline 90 \end{array}$

Name: ______________________________

Multiplication Timed Practice Sheet 6

Number Correct: ______

1 4×3	**2** 3×6	**3** 7×5	**4** 6×4
5 8×10	**6** 2×2	**7** 11×2	**8** 5×5
9 3×5	**10** 4×8	**11** 7×9	**12** 8×12
13 2×10	**14** 1×8	**15** 6×11	**16** 11×12
17 12×8	**18** 10×6	**19** 2×5	**20** 9×7

Multiplication Timed Practice Sheet 6

1 $4 \times 3 = 12$	**2** $3 \times 6 = 18$	**3** $7 \times 5 = 35$	**4** $6 \times 4 = 24$
5 $8 \times 10 = 80$	**6** $2 \times 2 = 4$	**7** $11 \times 2 = 22$	**8** $5 \times 5 = 25$
9 $3 \times 5 = 15$	**10** $4 \times 8 = 32$	**11** $7 \times 9 = 63$	**12** $8 \times 12 = 96$
13 $2 \times 10 = 20$	**14** $1 \times 8 = 8$	**15** $6 \times 11 = 66$	**16** $11 \times 12 = 132$
17 $12 \times 8 = 96$	**18** $10 \times 6 = 60$	**19** $2 \times 5 = 10$	**20** $9 \times 7 = 63$

Name: ____________________

Multiplication Timed Practice Sheet 7

Number Correct: ______

1 $\begin{array}{r} 5 \\ \times\ 8 \\ \hline \end{array}$	**2** $\begin{array}{r} 4 \\ \times\ 4 \\ \hline \end{array}$	**3** $\begin{array}{r} 5 \\ \times\ 7 \\ \hline \end{array}$	**4** $\begin{array}{r} 9 \\ \times\ 2 \\ \hline \end{array}$
5 $\begin{array}{r} 8 \\ \times\ 11 \\ \hline \end{array}$	**6** $\begin{array}{r} 3 \\ \times\ 7 \\ \hline \end{array}$	**7** $\begin{array}{r} 2 \\ \times\ 6 \\ \hline \end{array}$	**8** $\begin{array}{r} 3 \\ \times\ 5 \\ \hline \end{array}$
9 $\begin{array}{r} 3 \\ \times\ 4 \\ \hline \end{array}$	**10** $\begin{array}{r} 9 \\ \times\ 12 \\ \hline \end{array}$	**11** $\begin{array}{r} 6 \\ \times\ 10 \\ \hline \end{array}$	**12** $\begin{array}{r} 8 \\ \times\ 3 \\ \hline \end{array}$
13 $\begin{array}{r} 12 \\ \times\ 11 \\ \hline \end{array}$	**14** $\begin{array}{r} 8 \\ \times\ 8 \\ \hline \end{array}$	**15** $\begin{array}{r} 5 \\ \times\ 4 \\ \hline \end{array}$	**16** $\begin{array}{r} 1 \\ \times\ 11 \\ \hline \end{array}$
17 $\begin{array}{r} 6 \\ \times\ 7 \\ \hline \end{array}$	**18** $\begin{array}{r} 7 \\ \times\ 6 \\ \hline \end{array}$	**19** $\begin{array}{r} 10 \\ \times\ 9 \\ \hline \end{array}$	**20** $\begin{array}{r} 6 \\ \times\ 5 \\ \hline \end{array}$

Multiplication Timed Practice Sheet 7

1 $\begin{array}{r} 5 \\ \times\ 8 \\ \hline 40 \end{array}$

2 $\begin{array}{r} 4 \\ \times\ 4 \\ \hline 16 \end{array}$

3 $\begin{array}{r} 5 \\ \times\ 7 \\ \hline 35 \end{array}$

4 $\begin{array}{r} 9 \\ \times\ 2 \\ \hline 18 \end{array}$

5 $\begin{array}{r} 8 \\ \times\ 11 \\ \hline 88 \end{array}$

6 $\begin{array}{r} 3 \\ \times\ 7 \\ \hline 21 \end{array}$

7 $\begin{array}{r} 2 \\ \times\ 6 \\ \hline 12 \end{array}$

8 $\begin{array}{r} 3 \\ \times\ 5 \\ \hline 15 \end{array}$

9 $\begin{array}{r} 3 \\ \times\ 4 \\ \hline 12 \end{array}$

10 $\begin{array}{r} 9 \\ \times\ 12 \\ \hline 108 \end{array}$

11 $\begin{array}{r} 6 \\ \times\ 10 \\ \hline 60 \end{array}$

12 $\begin{array}{r} 8 \\ \times\ 3 \\ \hline 24 \end{array}$

13 $\begin{array}{r} 12 \\ \times\ 11 \\ \hline 132 \end{array}$

14 $\begin{array}{r} 8 \\ \times\ 8 \\ \hline 64 \end{array}$

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

16 $\begin{array}{r} 1 \\ \times\ 11 \\ \hline 11 \end{array}$

17 $\begin{array}{r} 6 \\ \times\ 7 \\ \hline 42 \end{array}$

18 $\begin{array}{r} 7 \\ \times\ 6 \\ \hline 42 \end{array}$

19 $\begin{array}{r} 10 \\ \times\ 9 \\ \hline 90 \end{array}$

20 $\begin{array}{r} 6 \\ \times\ 5 \\ \hline 30 \end{array}$

Name: ______________________________

Multiplication Timed Practice Sheet 8

Number Correct: ______

1 $\begin{array}{r} 3 \\ \times\ 10 \\ \hline \end{array}$	**2** $\begin{array}{r} 9 \\ \times\ 6 \\ \hline \end{array}$	**3** $\begin{array}{r} 11 \\ \times\ 2 \\ \hline \end{array}$	**4** $\begin{array}{r} 6 \\ \times\ 10 \\ \hline \end{array}$
5 $\begin{array}{r} 7 \\ \times\ 9 \\ \hline \end{array}$	**6** $\begin{array}{r} 8 \\ \times\ 7 \\ \hline \end{array}$	**7** $\begin{array}{r} 5 \\ \times\ 2 \\ \hline \end{array}$	**8** $\begin{array}{r} 4 \\ \times\ 11 \\ \hline \end{array}$
9 $\begin{array}{r} 4 \\ \times\ 1 \\ \hline \end{array}$	**10** $\begin{array}{r} 6 \\ \times\ 9 \\ \hline \end{array}$	**11** $\begin{array}{r} 6 \\ \times\ 5 \\ \hline \end{array}$	**12** $\begin{array}{r} 8 \\ \times\ 5 \\ \hline \end{array}$
13 $\begin{array}{r} 10 \\ \times\ 3 \\ \hline \end{array}$	**14** $\begin{array}{r} 11 \\ \times\ 7 \\ \hline \end{array}$	**15** $\begin{array}{r} 2 \\ \times\ 12 \\ \hline \end{array}$	**16** $\begin{array}{r} 9 \\ \times\ 9 \\ \hline \end{array}$
17 $\begin{array}{r} 6 \\ \times\ 8 \\ \hline \end{array}$	**18** $\begin{array}{r} 2 \\ \times\ 3 \\ \hline \end{array}$	**19** $\begin{array}{r} 7 \\ \times\ 12 \\ \hline \end{array}$	**20** $\begin{array}{r} 4 \\ \times\ 2 \\ \hline \end{array}$

Multiplication Timed Practice Sheet 8

1 $\begin{array}{r} 3 \\ \times\ 10 \\ \hline 30 \end{array}$	**2** $\begin{array}{r} 9 \\ \times\ 6 \\ \hline 54 \end{array}$	**3** $\begin{array}{r} 11 \\ \times\ 2 \\ \hline 22 \end{array}$	**4** $\begin{array}{r} 6 \\ \times\ 10 \\ \hline 60 \end{array}$
5 $\begin{array}{r} 7 \\ \times\ 9 \\ \hline 63 \end{array}$	**6** $\begin{array}{r} 8 \\ \times\ 7 \\ \hline 56 \end{array}$	**7** $\begin{array}{r} 5 \\ \times\ 2 \\ \hline 10 \end{array}$	**8** $\begin{array}{r} 4 \\ \times\ 11 \\ \hline 44 \end{array}$
9 $\begin{array}{r} 4 \\ \times\ 1 \\ \hline 4 \end{array}$	**10** $\begin{array}{r} 6 \\ \times\ 9 \\ \hline 54 \end{array}$	**11** $\begin{array}{r} 6 \\ \times\ 5 \\ \hline 30 \end{array}$	**12** $\begin{array}{r} 8 \\ \times\ 5 \\ \hline 40 \end{array}$
13 $\begin{array}{r} 10 \\ \times\ 3 \\ \hline 30 \end{array}$	**14** $\begin{array}{r} 11 \\ \times\ 7 \\ \hline 77 \end{array}$	**15** $\begin{array}{r} 2 \\ \times\ 12 \\ \hline 24 \end{array}$	**16** $\begin{array}{r} 9 \\ \times\ 9 \\ \hline 81 \end{array}$
17 $\begin{array}{r} 6 \\ \times\ 8 \\ \hline 48 \end{array}$	**18** $\begin{array}{r} 2 \\ \times\ 3 \\ \hline 6 \end{array}$	**19** $\begin{array}{r} 7 \\ \times\ 12 \\ \hline 84 \end{array}$	**20** $\begin{array}{r} 4 \\ \times\ 2 \\ \hline 8 \end{array}$

Name: ______________________________

Multiplication Timed Practice Sheet 9

Number Correct: ______

1 $\begin{array}{r} 6 \\ \times\ 2 \\ \hline \end{array}$

2 $\begin{array}{r} 9 \\ \times\ 5 \\ \hline \end{array}$

3 $\begin{array}{r} 11 \\ \times\ \ 8 \\ \hline \end{array}$

4 $\begin{array}{r} 2 \\ \times\ 6 \\ \hline \end{array}$

5 $\begin{array}{r} 5 \\ \times\ 6 \\ \hline \end{array}$

6 $\begin{array}{r} 8 \\ \times\ 9 \\ \hline \end{array}$

7 $\begin{array}{r} 9 \\ \times\ 8 \\ \hline \end{array}$

8 $\begin{array}{r} 10 \\ \times\ \ 4 \\ \hline \end{array}$

9 $\begin{array}{r} 12 \\ \times\ \ 3 \\ \hline \end{array}$

10 $\begin{array}{r} 11 \\ \times\ 11 \\ \hline \end{array}$

11 $\begin{array}{r} 4 \\ \times\ 10 \\ \hline \end{array}$

12 $\begin{array}{r} 7 \\ \times\ 8 \\ \hline \end{array}$

13 $\begin{array}{r} 3 \\ \times\ 9 \\ \hline \end{array}$

14 $\begin{array}{r} 4 \\ \times\ 9 \\ \hline \end{array}$

15 $\begin{array}{r} 8 \\ \times\ 2 \\ \hline \end{array}$

16 $\begin{array}{r} 12 \\ \times\ \ 9 \\ \hline \end{array}$

17 $\begin{array}{r} 11 \\ \times\ \ 3 \\ \hline \end{array}$

18 $\begin{array}{r} 10 \\ \times\ \ 7 \\ \hline \end{array}$

19 $\begin{array}{r} 1 \\ \times\ 6 \\ \hline \end{array}$

20 $\begin{array}{r} 2 \\ \times\ 8 \\ \hline \end{array}$

Multiplication Timed Practice Sheet 9

1 $\begin{array}{r} 6 \\ \times\ 2 \\ \hline 12 \end{array}$	**2** $\begin{array}{r} 9 \\ \times\ 5 \\ \hline 45 \end{array}$	**3** $\begin{array}{r} 11 \\ \times\ \ 8 \\ \hline 88 \end{array}$	**4** $\begin{array}{r} 2 \\ \times\ 6 \\ \hline 12 \end{array}$
5 $\begin{array}{r} 5 \\ \times\ 6 \\ \hline 30 \end{array}$	**6** $\begin{array}{r} 8 \\ \times\ 9 \\ \hline 72 \end{array}$	**7** $\begin{array}{r} 9 \\ \times\ 8 \\ \hline 72 \end{array}$	**8** $\begin{array}{r} 10 \\ \times\ \ 4 \\ \hline 40 \end{array}$
9 $\begin{array}{r} 12 \\ \times\ \ 3 \\ \hline 36 \end{array}$	**10** $\begin{array}{r} 11 \\ \times\ 11 \\ \hline 121 \end{array}$	**11** $\begin{array}{r} 4 \\ \times\ 10 \\ \hline 40 \end{array}$	**12** $\begin{array}{r} 7 \\ \times\ 8 \\ \hline 56 \end{array}$
13 $\begin{array}{r} 3 \\ \times\ 9 \\ \hline 27 \end{array}$	**14** $\begin{array}{r} 4 \\ \times\ 9 \\ \hline 36 \end{array}$	**15** $\begin{array}{r} 8 \\ \times\ 2 \\ \hline 16 \end{array}$	**16** $\begin{array}{r} 12 \\ \times\ \ 9 \\ \hline 108 \end{array}$
17 $\begin{array}{r} 11 \\ \times\ \ 3 \\ \hline 33 \end{array}$	**18** $\begin{array}{r} 10 \\ \times\ \ 7 \\ \hline 70 \end{array}$	**19** $\begin{array}{r} 1 \\ \times\ 6 \\ \hline 6 \end{array}$	**20** $\begin{array}{r} 2 \\ \times\ 8 \\ \hline 16 \end{array}$

Name: ________________________________

Multiplication Timed Practice Sheet 10

Number Correct: ______

1 $\begin{array}{r} 3 \\ \times\ 8 \\ \hline \end{array}$	**2** $\begin{array}{r} 6 \\ \times\ 3 \\ \hline \end{array}$	**3** $\begin{array}{r} 3 \\ \times\ 3 \\ \hline \end{array}$	**4** $\begin{array}{r} 10 \\ \times\ 1 \\ \hline \end{array}$
5 $\begin{array}{r} 2 \\ \times\ 5 \\ \hline \end{array}$	**6** $\begin{array}{r} 2 \\ \times\ 11 \\ \hline \end{array}$	**7** $\begin{array}{r} 9 \\ \times\ 9 \\ \hline \end{array}$	**8** $\begin{array}{r} 9 \\ \times\ 5 \\ \hline \end{array}$
9 $\begin{array}{r} 2 \\ \times\ 9 \\ \hline \end{array}$	**10** $\begin{array}{r} 6 \\ \times\ 6 \\ \hline \end{array}$	**11** $\begin{array}{r} 2 \\ \times\ 3 \\ \hline \end{array}$	**12** $\begin{array}{r} 12 \\ \times\ 3 \\ \hline \end{array}$
13 $\begin{array}{r} 2 \\ \times\ 7 \\ \hline \end{array}$	**14** $\begin{array}{r} 12 \\ \times\ 10 \\ \hline \end{array}$	**15** $\begin{array}{r} 8 \\ \times\ 4 \\ \hline \end{array}$	**16** $\begin{array}{r} 11 \\ \times\ 8 \\ \hline \end{array}$
17 $\begin{array}{r} 11 \\ \times\ 4 \\ \hline \end{array}$	**18** $\begin{array}{r} 5 \\ \times\ 5 \\ \hline \end{array}$	**19** $\begin{array}{r} 10 \\ \times\ 11 \\ \hline \end{array}$	**20** $\begin{array}{r} 7 \\ \times\ 2 \\ \hline \end{array}$

Multiplication Timed Practice Sheet 10

1 $\begin{array}{r} 3 \\ \times\ 8 \\ \hline 24 \end{array}$	**2** $\begin{array}{r} 6 \\ \times\ 3 \\ \hline 18 \end{array}$	**3** $\begin{array}{r} 3 \\ \times\ 3 \\ \hline 9 \end{array}$	**4** $\begin{array}{r} 10 \\ \times\ 1 \\ \hline 10 \end{array}$
5 $\begin{array}{r} 2 \\ \times\ 5 \\ \hline 10 \end{array}$	**6** $\begin{array}{r} 2 \\ \times\ 11 \\ \hline 22 \end{array}$	**7** $\begin{array}{r} 9 \\ \times\ 9 \\ \hline 81 \end{array}$	**8** $\begin{array}{r} 9 \\ \times\ 5 \\ \hline 45 \end{array}$
9 $\begin{array}{r} 2 \\ \times\ 9 \\ \hline 18 \end{array}$	**10** $\begin{array}{r} 6 \\ \times\ 6 \\ \hline 36 \end{array}$	**11** $\begin{array}{r} 2 \\ \times\ 3 \\ \hline 6 \end{array}$	**12** $\begin{array}{r} 12 \\ \times\ 3 \\ \hline 36 \end{array}$
13 $\begin{array}{r} 2 \\ \times\ 7 \\ \hline 14 \end{array}$	**14** $\begin{array}{r} 12 \\ \times\ 10 \\ \hline 120 \end{array}$	**15** $\begin{array}{r} 8 \\ \times\ 4 \\ \hline 32 \end{array}$	**16** $\begin{array}{r} 11 \\ \times\ 8 \\ \hline 88 \end{array}$
17 $\begin{array}{r} 11 \\ \times\ 4 \\ \hline 44 \end{array}$	**18** $\begin{array}{r} 5 \\ \times\ 5 \\ \hline 25 \end{array}$	**19** $\begin{array}{r} 10 \\ \times\ 11 \\ \hline 110 \end{array}$	**20** $\begin{array}{r} 7 \\ \times\ 2 \\ \hline 14 \end{array}$

Name: ______________________________

Division Timed Practice Sheet 1

Number Correct: ______

1	$7\overline{)21}$	**2**	$5\overline{)10}$	**3**	$2\overline{)14}$	**4**	$9\overline{)27}$
5	$6\overline{)24}$	**6**	$10\overline{)70}$	**7**	$8\overline{)32}$	**8**	$6\overline{)36}$
9	$3\overline{)9}$	**10**	$5\overline{)35}$	**11**	$1\overline{)8}$	**12**	$12\overline{)24}$
13	$2\overline{)20}$	**14**	$8\overline{)40}$	**15**	$3\overline{)15}$	**16**	$4\overline{)32}$
17	$4\overline{)28}$	**18**	$7\overline{)42}$	**19**	$9\overline{)63}$	**20**	$6\overline{)66}$

Division Timed Practice Sheet 1

1 $\begin{array}{r} 3 \\ 7\overline{)21} \end{array}$	**2** $\begin{array}{r} 2 \\ 5\overline{)10} \end{array}$	**3** $\begin{array}{r} 7 \\ 2\overline{)14} \end{array}$	**4** $\begin{array}{r} 3 \\ 9\overline{)27} \end{array}$
5 $\begin{array}{r} 4 \\ 6\overline{)24} \end{array}$	**6** $\begin{array}{r} 7 \\ 10\overline{)70} \end{array}$	**7** $\begin{array}{r} 4 \\ 8\overline{)32} \end{array}$	**8** $\begin{array}{r} 6 \\ 6\overline{)36} \end{array}$
9 $\begin{array}{r} 3 \\ 3\overline{)9} \end{array}$	**10** $\begin{array}{r} 7 \\ 5\overline{)35} \end{array}$	**11** $\begin{array}{r} 8 \\ 1\overline{)8} \end{array}$	**12** $\begin{array}{r} 2 \\ 12\overline{)24} \end{array}$
13 $\begin{array}{r} 10 \\ 2\overline{)20} \end{array}$	**14** $\begin{array}{r} 5 \\ 8\overline{)40} \end{array}$	**15** $\begin{array}{r} 5 \\ 3\overline{)15} \end{array}$	**16** $\begin{array}{r} 8 \\ 4\overline{)32} \end{array}$
17 $\begin{array}{r} 7 \\ 4\overline{)28} \end{array}$	**18** $\begin{array}{r} 6 \\ 7\overline{)42} \end{array}$	**19** $\begin{array}{r} 7 \\ 9\overline{)63} \end{array}$	**20** $\begin{array}{r} 11 \\ 6\overline{)66} \end{array}$

Name: ______________________________

Division Timed Practice Sheet 2

Number Correct: ______

1 $2\overline{)10}$	**2** $3\overline{)27}$	**3** $3\overline{)21}$	**4** $7\overline{)14}$
5 $6\overline{)30}$	**6** $1\overline{)6}$	**7** $6\overline{)54}$	**8** $12\overline{)60}$
9 $3\overline{)36}$	**10** $4\overline{)24}$	**11** $5\overline{)25}$	**12** $10\overline{)80}$
13 $8\overline{)16}$	**14** $11\overline{)44}$	**15** $8\overline{)24}$	**16** $5\overline{)30}$
17 $9\overline{)54}$	**18** $6\overline{)60}$	**19** $8\overline{)72}$	**20** $7\overline{)56}$

Division Timed Practice Sheet 2

1 $\begin{array}{r} 5 \\ 2\overline{)10} \end{array}$	**2** $\begin{array}{r} 9 \\ 3\overline{)27} \end{array}$	**3** $\begin{array}{r} 7 \\ 3\overline{)21} \end{array}$	**4** $\begin{array}{r} 2 \\ 7\overline{)14} \end{array}$
5 $\begin{array}{r} 5 \\ 6\overline{)30} \end{array}$	**6** $\begin{array}{r} 6 \\ 1\overline{)\ 6} \end{array}$	**7** $\begin{array}{r} 9 \\ 6\overline{)54} \end{array}$	**8** $\begin{array}{r} 5 \\ 12\overline{)60} \end{array}$
9 $\begin{array}{r} 12 \\ 3\overline{)36} \end{array}$	**10** $\begin{array}{r} 6 \\ 4\overline{)24} \end{array}$	**11** $\begin{array}{r} 5 \\ 5\overline{)25} \end{array}$	**12** $\begin{array}{r} 8 \\ 10\overline{)80} \end{array}$
13 $\begin{array}{r} 2 \\ 8\overline{)16} \end{array}$	**14** $\begin{array}{r} 4 \\ 11\overline{)44} \end{array}$	**15** $\begin{array}{r} 3 \\ 8\overline{)24} \end{array}$	**16** $\begin{array}{r} 6 \\ 5\overline{)30} \end{array}$
17 $\begin{array}{r} 6 \\ 9\overline{)54} \end{array}$	**18** $\begin{array}{r} 10 \\ 6\overline{)60} \end{array}$	**19** $\begin{array}{r} 9 \\ 8\overline{)72} \end{array}$	**20** $\begin{array}{r} 8 \\ 7\overline{)56} \end{array}$

Name: ____________________

Division Timed Practice Sheet 3

Number Correct: ______

1	$11\overline{)66}$	**2**	$2\overline{)18}$	**3**	$6\overline{)42}$	**4**	$7\overline{)63}$
5	$5\overline{)45}$	**6**	$3\overline{)24}$	**7**	$9\overline{)36}$	**8**	$1\overline{)12}$
9	$4\overline{)20}$	**10**	$10\overline{)30}$	**11**	$9\overline{)36}$	**12**	$9\overline{)90}$
13	$8\overline{)80}$	**14**	$3\overline{)18}$	**15**	$8\overline{)24}$	**16**	$4\overline{)16}$
17	$7\overline{)35}$	**18**	$6\overline{)18}$	**19**	$9\overline{)99}$	**20**	$12\overline{)120}$

Division Timed Practice Sheet 3

1 $11\overline{)66}$ answer: 6	**2** $2\overline{)18}$ answer: 9	**3** $6\overline{)42}$ answer: 7	**4** $7\overline{)63}$ answer: 9
5 $5\overline{)45}$ answer: 9	**6** $3\overline{)24}$ answer: 8	**7** $9\overline{)36}$ answer: 4	**8** $1\overline{)12}$ answer: 12
9 $4\overline{)20}$ answer: 5	**10** $10\overline{)30}$ answer: 3	**11** $9\overline{)36}$ answer: 4	**12** $9\overline{)90}$ answer: 10
13 $8\overline{)80}$ answer: 10	**14** $3\overline{)18}$ answer: 6	**15** $8\overline{)24}$ answer: 3	**16** $4\overline{)16}$ answer: 4
17 $7\overline{)35}$ answer: 5	**18** $6\overline{)18}$ answer: 3	**19** $9\overline{)99}$ answer: 11	**20** $12\overline{)120}$ answer: 10

Name: ______________________________

Division Timed Practice Sheet 4

Number Correct: ______

1	$5\overline{)15}$	**2**	$11\overline{)55}$	**3**	$4\overline{)12}$	**4**	$9\overline{)45}$
5	$7\overline{)28}$	**6**	$4\overline{)36}$	**7**	$1\overline{)7}$	**8**	$10\overline{)60}$
9	$2\overline{)16}$	**10**	$5\overline{)40}$	**11**	$8\overline{)56}$	**12**	$2\overline{)24}$
13	$9\overline{)18}$	**14**	$11\overline{)88}$	**15**	$12\overline{)48}$	**16**	$7\overline{)49}$
17	$7\overline{)56}$	**18**	$3\overline{)6}$	**19**	$4\overline{)40}$	**20**	$6\overline{)30}$

Division Timed Practice Sheet 4

1 $\begin{array}{r} 3 \\ 5\overline{)15} \end{array}$	**2** $\begin{array}{r} 5 \\ 11\overline{)55} \end{array}$	**3** $\begin{array}{r} 3 \\ 4\overline{)12} \end{array}$	**4** $\begin{array}{r} 5 \\ 9\overline{)45} \end{array}$
5 $\begin{array}{r} 4 \\ 7\overline{)28} \end{array}$	**6** $\begin{array}{r} 9 \\ 4\overline{)36} \end{array}$	**7** $\begin{array}{r} 7 \\ 1\overline{)\ 7} \end{array}$	**8** $\begin{array}{r} 6 \\ 10\overline{)60} \end{array}$
9 $\begin{array}{r} 8 \\ 2\overline{)16} \end{array}$	**10** $\begin{array}{r} 8 \\ 5\overline{)40} \end{array}$	**11** $\begin{array}{r} 7 \\ 8\overline{)56} \end{array}$	**12** $\begin{array}{r} 12 \\ 2\overline{)24} \end{array}$
13 $\begin{array}{r} 2 \\ 9\overline{)18} \end{array}$	**14** $\begin{array}{r} 8 \\ 11\overline{)88} \end{array}$	**15** $\begin{array}{r} 4 \\ 12\overline{)48} \end{array}$	**16** $\begin{array}{r} 7 \\ 7\overline{)49} \end{array}$
17 $\begin{array}{r} 8 \\ 7\overline{)56} \end{array}$	**18** $\begin{array}{r} 2 \\ 3\overline{)\ 6} \end{array}$	**19** $\begin{array}{r} 10 \\ 4\overline{)40} \end{array}$	**20** $\begin{array}{r} 5 \\ 6\overline{)30} \end{array}$

Name: ______________________________

Division Timed Practice Sheet 5

Number Correct: ______

1	$3\overline{)21}$	**2**	$6\overline{)12}$	**3**	$3\overline{)36}$	**4**	$3\overline{)15}$
5	$9\overline{)36}$	**6**	$8\overline{)48}$	**7**	$3\overline{)12}$	**8**	$10\overline{)90}$
9	$4\overline{)24}$	**10**	$5\overline{)60}$	**11**	$11\overline{)33}$	**12**	$8\overline{)64}$
13	$1\overline{)4}$	**14**	$4\overline{)28}$	**15**	$6\overline{)48}$	**16**	$5\overline{)55}$
17	$12\overline{)24}$	**18**	$7\overline{)70}$	**19**	$9\overline{)27}$	**20**	$12\overline{)96}$

Division Timed Practice Sheet 5

1 $\begin{array}{r} 7 \\ 3\overline{)21} \end{array}$

2 $\begin{array}{r} 2 \\ 6\overline{)12} \end{array}$

3 $\begin{array}{r} 12 \\ 3\overline{)36} \end{array}$

4 $\begin{array}{r} 5 \\ 3\overline{)15} \end{array}$

5 $\begin{array}{r} 4 \\ 9\overline{)36} \end{array}$

6 $\begin{array}{r} 6 \\ 8\overline{)48} \end{array}$

7 $\begin{array}{r} 4 \\ 3\overline{)12} \end{array}$

8 $\begin{array}{r} 9 \\ 10\overline{)90} \end{array}$

9 $\begin{array}{r} 6 \\ 4\overline{)24} \end{array}$

10 $\begin{array}{r} 12 \\ 5\overline{)60} \end{array}$

11 $\begin{array}{r} 3 \\ 11\overline{)33} \end{array}$

12 $\begin{array}{r} 8 \\ 8\overline{)64} \end{array}$

13 $\begin{array}{r} 4 \\ 1\overline{)\ 4} \end{array}$

14 $\begin{array}{r} 7 \\ 4\overline{)28} \end{array}$

15 $\begin{array}{r} 8 \\ 6\overline{)48} \end{array}$

16 $\begin{array}{r} 11 \\ 5\overline{)55} \end{array}$

17 $\begin{array}{r} 2 \\ 12\overline{)24} \end{array}$

18 $\begin{array}{r} 10 \\ 7\overline{)70} \end{array}$

19 $\begin{array}{r} 3 \\ 9\overline{)27} \end{array}$

20 $\begin{array}{r} 8 \\ 12\overline{)96} \end{array}$

Name: ____

Division Timed Practice Sheet 6

Number Correct: ______

1	$2\overline{)20}$	**2**	$8\overline{)16}$	**3**	$5\overline{)20}$	**4**	$1\overline{)3}$
5	$5\overline{)35}$	**6**	$4\overline{)44}$	**7**	$6\overline{)48}$	**8**	$11\overline{)110}$
9	$3\overline{)18}$	**10**	$2\overline{)4}$	**11**	$3\overline{)27}$	**12**	$6\overline{)72}$
13	$9\overline{)81}$	**14**	$3\overline{)24}$	**15**	$10\overline{)20}$	**16**	$4\overline{)48}$
17	$6\overline{)30}$	**18**	$10\overline{)110}$	**19**	$9\overline{)54}$	**20**	$7\overline{)28}$

Division Timed Practice Sheet 6

1 $2\overline{)20}$ Answer: 10	**2** $8\overline{)16}$ Answer: 2	**3** $5\overline{)20}$ Answer: 4	**4** $1\overline{)3}$ Answer: 3
5 $5\overline{)35}$ Answer: 7	**6** $4\overline{)44}$ Answer: 11	**7** $6\overline{)48}$ Answer: 8	**8** $11\overline{)110}$ Answer: 10
9 $3\overline{)18}$ Answer: 6	**10** $2\overline{)4}$ Answer: 2	**11** $3\overline{)27}$ Answer: 9	**12** $6\overline{)72}$ Answer: 12
13 $9\overline{)81}$ Answer: 9	**14** $3\overline{)24}$ Answer: 8	**15** $10\overline{)20}$ Answer: 2	**16** $4\overline{)48}$ Answer: 12
17 $6\overline{)30}$ Answer: 5	**18** $10\overline{)110}$ Answer: 11	**19** $9\overline{)54}$ Answer: 6	**20** $7\overline{)28}$ Answer: 4

Name: ____________________

Division Timed Practice Sheet 7

Number Correct: ______

1	$2\overline{)10}$	**2**	$8\overline{)40}$	**3**	$3\overline{)9}$	**4**	$11\overline{)55}$
5	$8\overline{)56}$	**6**	$8\overline{)32}$	**7**	$7\overline{)63}$	**8**	$2\overline{)22}$
9	$4\overline{)36}$	**10**	$10\overline{)80}$	**11**	$8\overline{)64}$	**12**	$12\overline{)72}$
13	$5\overline{)15}$	**14**	$9\overline{)63}$	**15**	$7\overline{)77}$	**16**	$6\overline{)18}$
17	$5\overline{)50}$	**18**	$6\overline{)36}$	**19**	$6\overline{)24}$	**20**	$1\overline{)9}$

Division Timed Practice Sheet 7

1 $2\overline{)10}$ 5	**2** $8\overline{)40}$ 5	**3** $3\overline{)9}$ 3	**4** $11\overline{)55}$ 5
5 $8\overline{)56}$ 7	**6** $8\overline{)32}$ 4	**7** $7\overline{)63}$ 9	**8** $2\overline{)22}$ 11
9 $4\overline{)36}$ 9	**10** $10\overline{)80}$ 8	**11** $8\overline{)64}$ 8	**12** $12\overline{)72}$ 6
13 $5\overline{)15}$ 3	**14** $9\overline{)63}$ 7	**15** $7\overline{)77}$ 11	**16** $6\overline{)18}$ 3
17 $5\overline{)50}$ 10	**18** $6\overline{)36}$ 6	**19** $6\overline{)24}$ 4	**20** $1\overline{)9}$ 9

Name: ____________________

Division Timed Practice Sheet 8

Number Correct: ______

1 $9\overline{)45}$	**2** $11\overline{)66}$	**3** $2\overline{)4}$	**4** $2\overline{)12}$
5 $1\overline{)5}$	**6** $12\overline{)108}$	**7** $5\overline{)55}$	**8** $7\overline{)49}$
9 $5\overline{)60}$	**10** $4\overline{)8}$	**11** $4\overline{)32}$	**12** $10\overline{)40}$
13 $7\overline{)84}$	**14** $7\overline{)21}$	**15** $12\overline{)144}$	**16** $6\overline{)54}$
17 $9\overline{)81}$	**18** $11\overline{)99}$	**19** $4\overline{)40}$	**20** $5\overline{)50}$

Division Timed Practice Sheet 8

1 $\begin{array}{r} 5 \\ 9\overline{)45} \end{array}$

2 $\begin{array}{r} 6 \\ 11\overline{)66} \end{array}$

3 $\begin{array}{r} 2 \\ 2\overline{)4} \end{array}$

4 $\begin{array}{r} 6 \\ 2\overline{)12} \end{array}$

5 $\begin{array}{r} 5 \\ 1\overline{)5} \end{array}$

6 $\begin{array}{r} 9 \\ 12\overline{)108} \end{array}$

7 $\begin{array}{r} 11 \\ 5\overline{)55} \end{array}$

8 $\begin{array}{r} 7 \\ 7\overline{)49} \end{array}$

9 $\begin{array}{r} 12 \\ 5\overline{)60} \end{array}$

10 $\begin{array}{r} 2 \\ 4\overline{)8} \end{array}$

11 $\begin{array}{r} 8 \\ 4\overline{)32} \end{array}$

12 $\begin{array}{r} 4 \\ 10\overline{)40} \end{array}$

13 $\begin{array}{r} 12 \\ 7\overline{)84} \end{array}$

14 $\begin{array}{r} 3 \\ 7\overline{)21} \end{array}$

15 $\begin{array}{r} 12 \\ 12\overline{)144} \end{array}$

16 $\begin{array}{r} 9 \\ 6\overline{)54} \end{array}$

17 $\begin{array}{r} 9 \\ 9\overline{)81} \end{array}$

18 $\begin{array}{r} 9 \\ 11\overline{)99} \end{array}$

19 $\begin{array}{r} 10 \\ 4\overline{)40} \end{array}$

20 $\begin{array}{r} 10 \\ 5\overline{)50} \end{array}$

Name: ________________________________

Division Timed Practice Sheet 9

Number Correct: ______

1	$11\overline{)22}$	**2**	$4\overline{)12}$	**3**	$6\overline{)66}$	**4**	$5\overline{)30}$
5	$4\overline{)16}$	**6**	$2\overline{)6}$	**7**	$5\overline{)45}$	**8**	$10\overline{)120}$
9	$10\overline{)40}$	**10**	$8\overline{)88}$	**11**	$8\overline{)72}$	**12**	$12\overline{)36}$
13	$2\overline{)14}$	**14**	$11\overline{)121}$	**15**	$7\overline{)35}$	**16**	$1\overline{)10}$
17	$4\overline{)48}$	**18**	$9\overline{)72}$	**19**	$12\overline{)84}$	**20**	$3\overline{)33}$

Division Timed Practice Sheet 9

1 $11\overline{)22}$ 2

2 $4\overline{)12}$ 3

3 $6\overline{)66}$ 11

4 $5\overline{)30}$ 6

5 $4\overline{)16}$ 4

6 $2\overline{)6}$ 3

7 $5\overline{)45}$ 9

8 $10\overline{)120}$ 12

9 $10\overline{)40}$ 4

10 $8\overline{)88}$ 11

11 $8\overline{)72}$ 9

12 $12\overline{)36}$ 3

13 $2\overline{)14}$ 7

14 $11\overline{)121}$ 11

15 $7\overline{)35}$ 5

16 $1\overline{)10}$ 10

17 $4\overline{)48}$ 12

18 $9\overline{)72}$ 8

19 $12\overline{)84}$ 7

20 $3\overline{)33}$ 11

Name: ____________________

Division Timed Practice Sheet 10

Number Correct: ______

1	$10\overline{)70}$	**2**	$6\overline{)12}$	**3**	$2\overline{)8}$	**4**	$3\overline{)12}$
5	$5\overline{)25}$	**6**	$6\overline{)42}$	**7**	$5\overline{)20}$	**8**	$3\overline{)30}$
9	$2\overline{)18}$	**10**	$10\overline{)100}$	**11**	$4\overline{)12}$	**12**	$8\overline{)48}$
13	$7\overline{)42}$	**14**	$12\overline{)36}$	**15**	$4\overline{)48}$	**16**	$11\overline{)77}$
17	$9\overline{)72}$	**18**	$1\overline{)11}$	**19**	$3\overline{)33}$	**20**	$5\overline{)10}$

Division Timed Practice Sheet 10

1 $10\overline{)70}$ answer: 7	**2** $6\overline{)12}$ answer: 2	**3** $2\overline{)8}$ answer: 4	**4** $3\overline{)12}$ answer: 4
5 $5\overline{)25}$ answer: 5	**6** $6\overline{)42}$ answer: 7	**7** $5\overline{)20}$ answer: 4	**8** $3\overline{)30}$ answer: 10
9 $2\overline{)18}$ answer: 9	**10** $10\overline{)100}$ answer: 10	**11** $4\overline{)12}$ answer: 3	**12** $8\overline{)48}$ answer: 6
13 $7\overline{)42}$ answer: 6	**14** $12\overline{)36}$ answer: 3	**15** $4\overline{)48}$ answer: 12	**16** $11\overline{)77}$ answer: 7
17 $9\overline{)72}$ answer: 8	**18** $1\overline{)11}$ answer: 11	**19** $3\overline{)33}$ answer: 11	**20** $5\overline{)10}$ answer: 2

Name: ____________________

Mixed Facts Timed Practice Sheet 1

Number Correct: ______

1 $\begin{array}{r} 4 \\ \times\ 7 \\ \hline \end{array}$	**2** $2\overline{)16}$	**3** $\begin{array}{r} 4 \\ \times\ 5 \\ \hline \end{array}$	**4** $7\overline{)21}$
5 $\begin{array}{r} 11 \\ \times\ \ 1 \\ \hline \end{array}$	**6** $7\overline{)56}$	**7** $\begin{array}{r} 8 \\ \times\ 8 \\ \hline \end{array}$	**8** $\begin{array}{r} 3 \\ \times\ 4 \\ \hline \end{array}$
9 $4\overline{)36}$	**10** $3\overline{)18}$	**11** $8\overline{)64}$	**12** $\begin{array}{r} 3 \\ \times\ 12 \\ \hline \end{array}$
13 $9\overline{)45}$	**14** $7\overline{)70}$	**15** $\begin{array}{r} 7 \\ \times\ 6 \\ \hline \end{array}$	**16** $\begin{array}{r} 10 \\ \times\ \ 6 \\ \hline \end{array}$
17 $\begin{array}{r} 8 \\ \times\ 2 \\ \hline \end{array}$	**18** $\begin{array}{r} 9 \\ \times\ 6 \\ \hline \end{array}$	**19** $5\overline{)20}$	**20** $5\overline{)55}$

Mixed Facts Timed Practice Sheet 1

1 $\begin{array}{r} 4 \\ \times\ 7 \\ \hline 28 \end{array}$

2 $\begin{array}{r} 8 \\ 2\overline{)16} \end{array}$

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

4 $\begin{array}{r} 3 \\ 7\overline{)21} \end{array}$

5 $\begin{array}{r} 11 \\ \times\ \ 1 \\ \hline 11 \end{array}$

6 $\begin{array}{r} 8 \\ 7\overline{)56} \end{array}$

7 $\begin{array}{r} 8 \\ \times\ 8 \\ \hline 64 \end{array}$

8 $\begin{array}{r} 3 \\ \times\ 4 \\ \hline 12 \end{array}$

9 $\begin{array}{r} 9 \\ 4\overline{)36} \end{array}$

10 $\begin{array}{r} 6 \\ 3\overline{)18} \end{array}$

11 $\begin{array}{r} 8 \\ 8\overline{)64} \end{array}$

12 $\begin{array}{r} 3 \\ \times\ 12 \\ \hline 36 \end{array}$

13 $\begin{array}{r} 5 \\ 9\overline{)45} \end{array}$

14 $\begin{array}{r} 10 \\ 7\overline{)70} \end{array}$

15 $\begin{array}{r} 7 \\ \times\ 6 \\ \hline 42 \end{array}$

16 $\begin{array}{r} 10 \\ \times\ \ 6 \\ \hline 60 \end{array}$

17 $\begin{array}{r} 8 \\ \times\ 2 \\ \hline 16 \end{array}$

18 $\begin{array}{r} 9 \\ \times\ 6 \\ \hline 54 \end{array}$

19 $\begin{array}{r} 4 \\ 5\overline{)20} \end{array}$

20 $\begin{array}{r} 11 \\ 5\overline{)55} \end{array}$

Name: ____________________

Mixed Facts Timed Practice Sheet 2

Number Correct: ______

1 $\begin{array}{r} 2 \\ \times\ 9 \\ \hline \end{array}$

2 $\begin{array}{r} 5 \\ \times\ 10 \\ \hline \end{array}$

3 $2\overline{)12}$

4 $\begin{array}{r} 5 \\ \times\ 7 \\ \hline \end{array}$

5 $6\overline{)42}$

6 $\begin{array}{r} 11 \\ \times\ 4 \\ \hline \end{array}$

7 $\begin{array}{r} 7 \\ \times\ 8 \\ \hline \end{array}$

8 $8\overline{)32}$

9 $6\overline{)54}$

10 $3\overline{)33}$

11 $\begin{array}{r} 5 \\ \times\ 12 \\ \hline \end{array}$

12 $1\overline{)12}$

13 $\begin{array}{r} 12 \\ \times\ 2 \\ \hline \end{array}$

14 $4\overline{)16}$

15 $\begin{array}{r} 6 \\ \times\ 9 \\ \hline \end{array}$

16 $\begin{array}{r} 3 \\ \times\ 6 \\ \hline \end{array}$

17 $12\overline{)24}$

18 $\begin{array}{r} 3 \\ \times\ 8 \\ \hline \end{array}$

19 $10\overline{)20}$

20 $4\overline{)8}$

Mixed Facts Timed Practice Sheet 2

1 $\begin{array}{r} 2 \\ \times\ 9 \\ \hline 18 \end{array}$

2 $\begin{array}{r} 5 \\ \times\ 10 \\ \hline 50 \end{array}$

3 $2\overset{6}{\overline{)12}}$

4 $\begin{array}{r} 5 \\ \times\ 7 \\ \hline 35 \end{array}$

5 $6\overset{7}{\overline{)42}}$

6 $\begin{array}{r} 11 \\ \times\ 4 \\ \hline 44 \end{array}$

7 $\begin{array}{r} 7 \\ \times\ 8 \\ \hline 56 \end{array}$

8 $8\overset{4}{\overline{)32}}$

9 $6\overset{9}{\overline{)54}}$

10 $3\overset{11}{\overline{)33}}$

11 $\begin{array}{r} 5 \\ \times\ 12 \\ \hline 60 \end{array}$

12 $1\overset{12}{\overline{)12}}$

13 $\begin{array}{r} 12 \\ \times\ 2 \\ \hline 24 \end{array}$

14 $4\overset{4}{\overline{)16}}$

15 $\begin{array}{r} 6 \\ \times\ 9 \\ \hline 54 \end{array}$

16 $\begin{array}{r} 3 \\ \times\ 6 \\ \hline 18 \end{array}$

17 $12\overset{2}{\overline{)24}}$

18 $\begin{array}{r} 3 \\ \times\ 8 \\ \hline 24 \end{array}$

19 $10\overset{2}{\overline{)20}}$

20 $4\overset{2}{\overline{)8}}$

Name: ____________________

Mixed Facts Timed Practice Sheet 3

Number Correct: ______

1 $\begin{array}{r} 8 \\ \times\ 5 \\ \hline \end{array}$

2 $3\overline{)12}$

3 $\begin{array}{r} 4 \\ \times\ 8 \\ \hline \end{array}$

4 $8\overline{)56}$

5 $\begin{array}{r} 7 \\ \times\ 7 \\ \hline \end{array}$

6 $10\overline{)60}$

7 $4\overline{)8}$

8 $\begin{array}{r} 6 \\ \times\ 1 \\ \hline \end{array}$

9 $10\overline{)100}$

10 $\begin{array}{r} 9 \\ \times\ 2 \\ \hline \end{array}$

11 $9\overline{)99}$

12 $\begin{array}{r} 3 \\ \times\ 5 \\ \hline \end{array}$

13 $\begin{array}{r} 10 \\ \times\ 11 \\ \hline \end{array}$

14 $\begin{array}{r} 5 \\ \times\ 2 \\ \hline \end{array}$

15 $3\overline{)27}$

16 $\begin{array}{r} 12 \\ \times\ 4 \\ \hline \end{array}$

17 $8\overline{)40}$

18 $\begin{array}{r} 7 \\ \times\ 9 \\ \hline \end{array}$

19 $5\overline{)35}$

20 $12\overline{)36}$

Mixed Facts Timed Practice Sheet 3

1 $\begin{array}{r} 8 \\ \times\ 5 \\ \hline 40 \end{array}$

2 $3\overline{)12}$ — 4

3 $\begin{array}{r} 4 \\ \times\ 8 \\ \hline 32 \end{array}$

4 $8\overline{)56}$ — 7

5 $\begin{array}{r} 7 \\ \times\ 7 \\ \hline 49 \end{array}$

6 $10\overline{)60}$ — 6

7 $4\overline{)8}$ — 2

8 $\begin{array}{r} 6 \\ \times\ 1 \\ \hline 6 \end{array}$

9 $10\overline{)100}$ — 10

10 $\begin{array}{r} 9 \\ \times\ 2 \\ \hline 18 \end{array}$

11 $9\overline{)99}$ — 11

12 $\begin{array}{r} 3 \\ \times\ 5 \\ \hline 15 \end{array}$

13 $\begin{array}{r} 10 \\ \times\ 11 \\ \hline 110 \end{array}$

14 $\begin{array}{r} 5 \\ \times\ 2 \\ \hline 10 \end{array}$

15 $3\overline{)27}$ — 9

16 $\begin{array}{r} 12 \\ \times\ 4 \\ \hline 48 \end{array}$

17 $8\overline{)40}$ — 5

18 $\begin{array}{r} 7 \\ \times\ 9 \\ \hline 63 \end{array}$

19 $5\overline{)35}$ — 7

20 $12\overline{)36}$ — 3

Name: ______________________________

Mixed Facts Timed Practice Sheet 4

Number Correct: ______

1 $\begin{array}{r} 4 \\ \times\ 6 \\ \hline \end{array}$

2 $5\overline{)40}$

3 $\begin{array}{r} 2 \\ \times\ 11 \\ \hline \end{array}$

4 $3\overline{)21}$

5 $1\overline{)7}$

6 $\begin{array}{r} 12 \\ \times\ \ 6 \\ \hline \end{array}$

7 $4\overline{)12}$

8 $\begin{array}{r} 2 \\ \times\ 10 \\ \hline \end{array}$

9 $\begin{array}{r} 6 \\ \times\ 8 \\ \hline \end{array}$

10 $5\overline{)50}$

11 $\begin{array}{r} 3 \\ \times\ 3 \\ \hline \end{array}$

12 $9\overline{)72}$

13 $\begin{array}{r} 8 \\ \times\ 10 \\ \hline \end{array}$

14 $\begin{array}{r} 7 \\ \times\ 4 \\ \hline \end{array}$

15 $11\overline{)99}$

16 $\begin{array}{r} 5 \\ \times\ 9 \\ \hline \end{array}$

17 $12\overline{)60}$

18 $6\overline{)36}$

19 $\begin{array}{r} 3 \\ \times\ 5 \\ \hline \end{array}$

20 $7\overline{)28}$

Mixed Facts Timed Practice Sheet 4

1 $\begin{array}{r} 4 \\ \times\ 6 \\ \hline 24 \end{array}$

2 $5\overline{)40}$ = 8

3 $\begin{array}{r} 2 \\ \times\ 11 \\ \hline 22 \end{array}$

4 $3\overline{)21}$ = 7

5 $1\overline{)7}$ = 7

6 $\begin{array}{r} 12 \\ \times\ 6 \\ \hline 72 \end{array}$

7 $4\overline{)12}$ = 3

8 $\begin{array}{r} 2 \\ \times\ 10 \\ \hline 20 \end{array}$

9 $\begin{array}{r} 6 \\ \times\ 8 \\ \hline 48 \end{array}$

10 $5\overline{)50}$ = 10

11 $\begin{array}{r} 3 \\ \times\ 3 \\ \hline 9 \end{array}$

12 $9\overline{)72}$ = 8

13 $\begin{array}{r} 8 \\ \times\ 10 \\ \hline 80 \end{array}$

14 $\begin{array}{r} 7 \\ \times\ 4 \\ \hline 28 \end{array}$

15 $11\overline{)99}$ = 9

16 $\begin{array}{r} 5 \\ \times\ 9 \\ \hline 45 \end{array}$

17 $12\overline{)60}$ = 5

18 $6\overline{)36}$ = 6

19 $\begin{array}{r} 3 \\ \times\ 5 \\ \hline 15 \end{array}$

20 $7\overline{)28}$ = 4

Name: ________________________________

Mixed Facts Timed Practice Sheet 5

Number Correct: ______

1 $\begin{array}{r} 10 \\ \times\ 2 \\ \hline \end{array}$

2 $\begin{array}{r} 3 \\ \times\ 11 \\ \hline \end{array}$

3 $3\overline{)15}$

4 $11\overline{)55}$

5 $12\overline{)24}$

6 $\begin{array}{r} 7 \\ \times\ 5 \\ \hline \end{array}$

7 $\begin{array}{r} 9 \\ \times\ 1 \\ \hline \end{array}$

8 $\begin{array}{r} 9 \\ \times\ 7 \\ \hline \end{array}$

9 $\begin{array}{r} 8 \\ \times\ 4 \\ \hline \end{array}$

10 $\begin{array}{r} 11 \\ \times\ 7 \\ \hline \end{array}$

11 $3\overline{)12}$

12 $4\overline{)20}$

13 $7\overline{)35}$

14 $9\overline{)36}$

15 $\begin{array}{r} 12 \\ \times\ 10 \\ \hline \end{array}$

16 $\begin{array}{r} 8 \\ \times\ 9 \\ \hline \end{array}$

17 $\begin{array}{r} 9 \\ \times\ 9 \\ \hline \end{array}$

18 $8\overline{)48}$

19 $6\overline{)60}$

20 $4\overline{)24}$

Mixed Facts Timed Practice Sheet 5

1 $\begin{array}{r} 10 \\ \times\ 2 \\ \hline 20 \end{array}$

2 $\begin{array}{r} 3 \\ \times\ 11 \\ \hline 33 \end{array}$

3 $3\overset{5}{\overline{)15}}$

4 $11\overset{5}{\overline{)55}}$

5 $12\overset{2}{\overline{)24}}$

6 $\begin{array}{r} 7 \\ \times\ 5 \\ \hline 35 \end{array}$

7 $\begin{array}{r} 9 \\ \times\ 1 \\ \hline 9 \end{array}$

8 $\begin{array}{r} 9 \\ \times\ 7 \\ \hline 63 \end{array}$

9 $\begin{array}{r} 8 \\ \times\ 4 \\ \hline 32 \end{array}$

10 $\begin{array}{r} 11 \\ \times\ 7 \\ \hline 77 \end{array}$

11 $3\overset{4}{\overline{)12}}$

12 $4\overset{5}{\overline{)20}}$

13 $7\overset{5}{\overline{)35}}$

14 $9\overset{4}{\overline{)36}}$

15 $\begin{array}{r} 12 \\ \times\ 10 \\ \hline 120 \end{array}$

16 $\begin{array}{r} 8 \\ \times\ 9 \\ \hline 72 \end{array}$

17 $\begin{array}{r} 9 \\ \times\ 9 \\ \hline 81 \end{array}$

18 $8\overset{6}{\overline{)48}}$

19 $6\overset{10}{\overline{)60}}$

20 $4\overset{6}{\overline{)24}}$

Name: ________________________________

Mixed Facts Timed Practice Sheet 6

Number Correct: ______

1 $\begin{array}{r} 3 \\ \times\ 9 \\ \hline \end{array}$	**2** $5\overline{)30}$	**3** $4\overline{)28}$	**4** $\begin{array}{r} 10 \\ \times\ 8 \\ \hline \end{array}$
5 $\begin{array}{r} 8 \\ \times\ 7 \\ \hline \end{array}$	**6** $\begin{array}{r} 7 \\ \times\ 3 \\ \hline \end{array}$	**7** $2\overline{)20}$	**8** $5\overline{)25}$
9 $6\overline{)24}$	**10** $\begin{array}{r} 2 \\ \times\ 12 \\ \hline \end{array}$	**11** $\begin{array}{r} 11 \\ \times\ 2 \\ \hline \end{array}$	**12** $12\overline{)48}$
13 $1\overline{)11}$	**14** $11\overline{)44}$	**15** $\begin{array}{r} 9 \\ \times\ 9 \\ \hline \end{array}$	**16** $\begin{array}{r} 5 \\ \times\ 3 \\ \hline \end{array}$
17 $5\overline{)15}$	**18** $\begin{array}{r} 9 \\ \times\ 4 \\ \hline \end{array}$	**19** $6\overline{)48}$	**20** $\begin{array}{r} 3 \\ \times\ 10 \\ \hline \end{array}$

Mixed Facts Timed Practice Sheet 6

1 $\begin{array}{r} 3 \\ \times\ 9 \\ \hline 27 \end{array}$

2 $5\overline{)30}$ = 6

3 $4\overline{)28}$ = 7

4 $\begin{array}{r} 10 \\ \times\ 8 \\ \hline 80 \end{array}$

5 $\begin{array}{r} 8 \\ \times\ 7 \\ \hline 56 \end{array}$

6 $\begin{array}{r} 7 \\ \times\ 3 \\ \hline 21 \end{array}$

7 $2\overline{)20}$ = 10

8 $5\overline{)25}$ = 5

9 $6\overline{)24}$ = 4

10 $\begin{array}{r} 2 \\ \times\ 12 \\ \hline 24 \end{array}$

11 $\begin{array}{r} 11 \\ \times\ 2 \\ \hline 22 \end{array}$

12 $12\overline{)48}$ = 4

13 $1\overline{)11}$ = 11

14 $11\overline{)44}$ = 4

15 $\begin{array}{r} 9 \\ \times\ 9 \\ \hline 81 \end{array}$

16 $\begin{array}{r} 5 \\ \times\ 3 \\ \hline 15 \end{array}$

17 $5\overline{)15}$ = 3

18 $\begin{array}{r} 9 \\ \times\ 4 \\ \hline 36 \end{array}$

19 $6\overline{)48}$ = 8

20 $\begin{array}{r} 3 \\ \times\ 10 \\ \hline 30 \end{array}$

Name: ______________________________

Mixed Facts Timed Practice Sheet 7

Number Correct: ______

1 $\begin{array}{r} 5 \\ \times\ 4 \\ \hline \end{array}$

2 $4\overline{)32}$

3 $\begin{array}{r} 8 \\ \times\ 3 \\ \hline \end{array}$

4 $7\overline{)14}$

5 $3\overline{)30}$

6 $7\overline{)42}$

7 $6\overline{)30}$

8 $\begin{array}{r} 6 \\ \times\ 7 \\ \hline \end{array}$

9 $\begin{array}{r} 6 \\ \times\ 4 \\ \hline \end{array}$

10 $4\overline{)40}$

11 $\begin{array}{r} 7 \\ \times\ 1 \\ \hline \end{array}$

12 $\begin{array}{r} 5 \\ \times\ 8 \\ \hline \end{array}$

13 $9\overline{)81}$

14 $\begin{array}{r} 10 \\ \times\ 12 \\ \hline \end{array}$

15 $9\overline{)63}$

16 $\begin{array}{r} 4 \\ \times\ 9 \\ \hline \end{array}$

17 $\begin{array}{r} 6 \\ \times\ 2 \\ \hline \end{array}$

18 $\begin{array}{r} 11 \\ \times\ 3 \\ \hline \end{array}$

19 $11\overline{)22}$

20 $10\overline{)70}$

Mixed Facts Timed Practice Sheet 7

1 $\begin{array}{r} 5 \\ \times\ 4 \\ \hline 20 \end{array}$

2 $4\overline{)32}$ = 8

3 $\begin{array}{r} 8 \\ \times\ 3 \\ \hline 24 \end{array}$

4 $7\overline{)14}$ = 2

5 $3\overline{)30}$ = 10

6 $7\overline{)42}$ = 6

7 $6\overline{)30}$ = 5

8 $\begin{array}{r} 6 \\ \times\ 7 \\ \hline 42 \end{array}$

9 $\begin{array}{r} 6 \\ \times\ 4 \\ \hline 24 \end{array}$

10 $4\overline{)40}$ = 10

11 $\begin{array}{r} 7 \\ \times\ 1 \\ \hline 7 \end{array}$

12 $\begin{array}{r} 5 \\ \times\ 8 \\ \hline 40 \end{array}$

13 $9\overline{)81}$ = 9

14 $\begin{array}{r} 10 \\ \times\ 12 \\ \hline 120 \end{array}$

15 $9\overline{)63}$ = 7

16 $\begin{array}{r} 4 \\ \times\ 9 \\ \hline 36 \end{array}$

17 $\begin{array}{r} 6 \\ \times\ 2 \\ \hline 12 \end{array}$

18 $\begin{array}{r} 11 \\ \times\ 3 \\ \hline 33 \end{array}$

19 $11\overline{)22}$ = 2

20 $10\overline{)70}$ = 7

Name: ______________________________

Mixed Facts Timed Practice Sheet 8

Number Correct: ______

1 $\begin{array}{r} 10 \\ \times\ 4 \\ \hline \end{array}$

2 $3\overline{)24}$

3 $5\overline{)45}$

4 $\begin{array}{r} 9 \\ \times\ 3 \\ \hline \end{array}$

5 $\begin{array}{r} 6 \\ \times\ 11 \\ \hline \end{array}$

6 $\begin{array}{r} 6 \\ \times\ 5 \\ \hline \end{array}$

7 $10\overline{)40}$

8 $1\overline{)5}$

9 $8\overline{)24}$

10 $3\overline{)36}$

11 $\begin{array}{r} 11 \\ \times\ 9 \\ \hline \end{array}$

12 $6\overline{)18}$

13 $12\overline{)72}$

14 $\begin{array}{r} 9 \\ \times\ 8 \\ \hline \end{array}$

15 $9\overline{)54}$

16 $\begin{array}{r} 8 \\ \times\ 6 \\ \hline \end{array}$

17 $7\overline{)14}$

18 $\begin{array}{r} 6 \\ \times\ 7 \\ \hline \end{array}$

19 $\begin{array}{r} 7 \\ \times\ 12 \\ \hline \end{array}$

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

Mixed Facts Timed Practice Sheet 8

1 $\begin{array}{r} 10 \\ \times\ 4 \\ \hline 40 \end{array}$

2 $\begin{array}{r} 8 \\ 3\overline{)24} \end{array}$

3 $\begin{array}{r} 9 \\ 5\overline{)45} \end{array}$

4 $\begin{array}{r} 9 \\ \times\ 3 \\ \hline 27 \end{array}$

5 $\begin{array}{r} 6 \\ \times\ 11 \\ \hline 66 \end{array}$

6 $\begin{array}{r} 6 \\ \times\ 5 \\ \hline 30 \end{array}$

7 $\begin{array}{r} 4 \\ 10\overline{)40} \end{array}$

8 $\begin{array}{r} 5 \\ 1\overline{)\ 5} \end{array}$

9 $\begin{array}{r} 3 \\ 8\overline{)24} \end{array}$

10 $\begin{array}{r} 12 \\ 3\overline{)36} \end{array}$

11 $\begin{array}{r} 11 \\ \times\ 9 \\ \hline 99 \end{array}$

12 $\begin{array}{r} 3 \\ 6\overline{)18} \end{array}$

13 $\begin{array}{r} 6 \\ 12\overline{)72} \end{array}$

14 $\begin{array}{r} 9 \\ \times\ 8 \\ \hline 72 \end{array}$

15 $\begin{array}{r} 6 \\ 9\overline{)54} \end{array}$

16 $\begin{array}{r} 8 \\ \times\ 6 \\ \hline 48 \end{array}$

17 $\begin{array}{r} 2 \\ 7\overline{)14} \end{array}$

18 $\begin{array}{r} 6 \\ \times\ 7 \\ \hline 42 \end{array}$

19 $\begin{array}{r} 7 \\ \times\ 12 \\ \hline 84 \end{array}$

20 $\begin{array}{r} 5 \\ \times\ 5 \\ \hline 25 \end{array}$

Name: ____________________

Mixed Facts Timed Practice Sheet 9

Number Correct: ______

1 $\begin{array}{r} 4 \\ \times\ 4 \\ \hline \end{array}$

2 $9\overline{)18}$

3 $\begin{array}{r} 9 \\ \times\ 5 \\ \hline \end{array}$

4 $3\overline{)12}$

5 $9\overline{)27}$

6 $\begin{array}{r} 11 \\ \times\ 11 \\ \hline \end{array}$

7 $5\overline{)60}$

8 $6\overline{)12}$

9 $6\overline{)60}$

10 $\begin{array}{r} 5 \\ \times\ 6 \\ \hline \end{array}$

11 $\begin{array}{r} 12 \\ \times\ 8 \\ \hline \end{array}$

12 $\begin{array}{r} 8 \\ \times\ 1 \\ \hline \end{array}$

13 $7\overline{)49}$

14 $\begin{array}{r} 6 \\ \times\ 2 \\ \hline \end{array}$

15 $\begin{array}{r} 11 \\ \times\ 10 \\ \hline \end{array}$

16 $7\overline{)77}$

17 $\begin{array}{r} 7 \\ \times\ 10 \\ \hline \end{array}$

18 $11\overline{)121}$

19 $8\overline{)16}$

20 $\begin{array}{r} 4 \\ \times\ 12 \\ \hline \end{array}$

Mixed Facts Timed Practice Sheet 9

1 $\begin{array}{r} 4 \\ \times\ 4 \\ \hline 16 \end{array}$

2 $9\overline{)18}$ answer: 2

3 $\begin{array}{r} 9 \\ \times\ 5 \\ \hline 45 \end{array}$

4 $3\overline{)12}$ answer: 4

5 $9\overline{)27}$ answer: 3

6 $\begin{array}{r} 11 \\ \times\ 11 \\ \hline 121 \end{array}$

7 $5\overline{)60}$ answer: 12

8 $6\overline{)12}$ answer: 2

9 $6\overline{)60}$ answer: 10

10 $\begin{array}{r} 5 \\ \times\ 6 \\ \hline 30 \end{array}$

11 $\begin{array}{r} 12 \\ \times\ 8 \\ \hline 96 \end{array}$

12 $\begin{array}{r} 8 \\ \times\ 1 \\ \hline 8 \end{array}$

13 $7\overline{)49}$ answer: 7

14 $\begin{array}{r} 6 \\ \times\ 2 \\ \hline 12 \end{array}$

15 $\begin{array}{r} 11 \\ \times\ 10 \\ \hline 110 \end{array}$

16 $7\overline{)77}$ answer: 11

17 $\begin{array}{r} 7 \\ \times\ 10 \\ \hline 70 \end{array}$

18 $11\overline{)121}$ answer: 11

19 $8\overline{)16}$ answer: 2

20 $\begin{array}{r} 4 \\ \times\ 12 \\ \hline 48 \end{array}$

Name: ______________________________

Mixed Facts Timed Practice Sheet 10

Number Correct: ______

1 $\begin{array}{r} 3 \\ \times\ 6 \\ \hline \end{array}$

2 $\begin{array}{r} 10 \\ \times\ 7 \\ \hline \end{array}$

3 $2\overline{)18}$

4 $11\overline{)88}$

5 $\begin{array}{r} 7 \\ \times\ 2 \\ \hline \end{array}$

6 $4\overline{)48}$

7 $\begin{array}{r} 9 \\ \times\ 10 \\ \hline \end{array}$

8 $8\overline{)72}$

9 $\begin{array}{r} 4 \\ \times\ 3 \\ \hline \end{array}$

10 $7\overline{)63}$

11 $\begin{array}{r} 3 \\ \times\ 7 \\ \hline \end{array}$

12 $\begin{array}{r} 11 \\ \times\ 6 \\ \hline \end{array}$

13 $3\overline{)9}$

14 $12\overline{)96}$

15 $1\overline{)10}$

16 $5\overline{)15}$

17 $10\overline{)90}$

18 $\begin{array}{r} 9 \\ \times\ 12 \\ \hline \end{array}$

19 $\begin{array}{r} 2 \\ \times\ 5 \\ \hline \end{array}$

20 $\begin{array}{r} 11 \\ \times\ 12 \\ \hline \end{array}$

Mixed Facts Timed Practice Sheet 10

1 $\begin{array}{r} 3 \\ \times\ 6 \\ \hline 18 \end{array}$	**2** $\begin{array}{r} 10 \\ \times\ \ 7 \\ \hline 70 \end{array}$	**3** $2\overline{)18}$ 9	**4** $11\overline{)88}$ 8
5 $\begin{array}{r} 7 \\ \times\ 2 \\ \hline 14 \end{array}$	**6** $4\overline{)48}$ 12	**7** $\begin{array}{r} 9 \\ \times\ 10 \\ \hline 90 \end{array}$	**8** $8\overline{)72}$ 9
9 $\begin{array}{r} 4 \\ \times\ 3 \\ \hline 12 \end{array}$	**10** $7\overline{)63}$ 9	**11** $\begin{array}{r} 3 \\ \times\ 7 \\ \hline 21 \end{array}$	**12** $\begin{array}{r} 11 \\ \times\ \ 6 \\ \hline 66 \end{array}$
13 $3\overline{)9}$ 3	**14** $12\overline{)96}$ 8	**15** $1\overline{)10}$ 10	**16** $5\overline{)15}$ 3
17 $10\overline{)90}$ 9	**18** $\begin{array}{r} 9 \\ \times\ 12 \\ \hline 108 \end{array}$	**19** $\begin{array}{r} 2 \\ \times\ 5 \\ \hline 10 \end{array}$	**20** $\begin{array}{r} 11 \\ \times\ 12 \\ \hline 132 \end{array}$

Name ______________________________

Fact Practice Graph