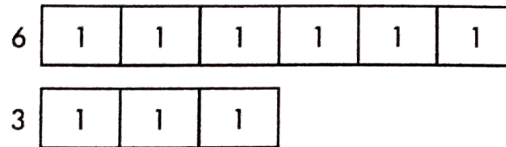


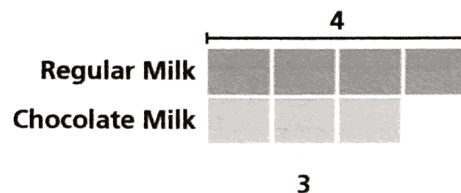
A **ratio** is a comparison of two numbers or the number of items in two groups. Each quantity in a ratio is called a **term**. Ratios can be written with the word "to" separating the terms (*a to b*), with a colon separating the terms (*a:b*), or in fraction form ($\frac{a}{b}$).

The ratio 6:3 can be modeled using a **bar diagram** with a row of 6 equal boxes and a row of 3 equal boxes as shown on the right.



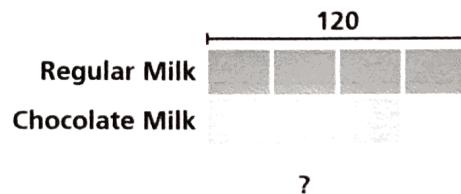
- The chorus at an elementary school is made up of fifth and sixth graders. This year, the chorus has 12 fifth-grade girls, 9 fifth-grade boys, 14 sixth-grade girls, and 10 sixth-grade boys.
 - The ratio of girls to boys is _____ to _____.
 - The ratio of fifth graders to sixth graders is _____ : _____.
 - The ratio of girls to the total number of students in the chorus is _____.
- The school cafeteria orders 4 cartons of regular milk for every 3 cartons of chocolate milk.

a. Complete the bar diagram to show the ratio.



b. The school ordered 120 cartons of regular milk. Divide 120 cartons of regular milk by _____ because there are _____ boxes in the top row.

c. Write the value of each box in both rows of the bar diagram.



d. How many cartons of chocolate milk did the school order?

On the Back!

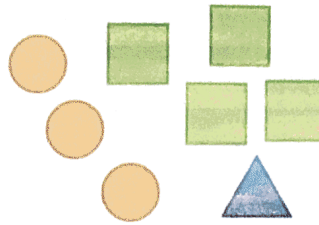
- A photocopier can copy 4 pages every 2 seconds. How long will it take to copy 120 pages? Draw a diagram to solve the problem.

Name: _____

5-1 Additional Practice

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In 1–6, use the shapes shown below. Write a ratio for each comparison in three ways.



1. The number of triangles to the total number of shapes
2. The number of squares to the number of triangles
3. The number of triangles to the number of squares
4. The number of triangles to the number of circles
5. The number of circles to the total number of shapes
6. The total number of shapes to the number of squares

In 7–10, draw a diagram to help solve each problem.

7. A cleaning crew can clean 5 offices in 6 hours. How many offices can they clean in 12 hours?
8. Joseph is planting a vegetable garden. He plants 2 tomato plants for every 5 pepper plants. If Joseph plants 14 tomato plants, how many pepper plants does he plant?
9. There are 4 adult chaperones for every 15 students who attend a school field trip. If there were 135 students, how many adults would there be on the field trip?
10. Ms. Dawson spent \$28 for 8 notebooks. If each notebook sells for the same price, how much would she have to spend for 48 notebooks?

11. There are 14 boys and 16 girls in Mr. Allen's class. What is the ratio of girls to the total number of students in the class? Write the ratio in 3 ways.

12. A pet store keeps 4 small fish in every 10 gallons of water. How many gallons of water are needed for 36 fish?

13. Gary has 24 quarters, 16 dimes, and 32 pennies. Write a ratio that compares the combined number of dimes and pennies to the number of quarters.

14. **Reasoning** There are 12 students who play the clarinet and 16 students who play the viola. What does the ratio 16:12 describe? © MP.2

15. **Be Precise** An orchard contains 12 rows of Granny Smith apple trees, 10 rows of Fuji apple trees, 15 rows of Gala apple trees, 2 rows of Golden Delicious apple trees, and 2 rows of Jonathan apple trees. Write each ratio in three ways. © MP.6

a. Rows of Gala apple trees to Granny Smith apple trees

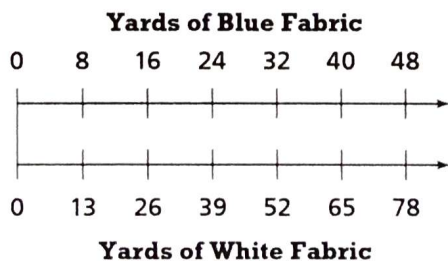
b. Rows of Fuji apple trees to the total number of rows of apple trees

16. **Higher Order Thinking** Lori is 6 years old. In three years, her cousin Philip will be twice as old as Lori will be. Write the ratio of Philip's age now to Lori's age now.

17. The ratio of desktop computers to laptop computers at a company is 2 to 9. If there were 108 laptop computers, how many computers would there be in all at the company?

© Assessment Practice

18. A company makes uniforms for a fast-food restaurant. For every 8 yards of blue fabric, they use 13 yards of white fabric. This is represented in the diagram below.



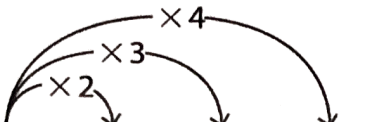
Explain how you would use the diagram to find the number of yards of white fabric used when 64 yards of blue fabric are used.



Two numbers are **equivalent** if they have the same value. Ratios are equivalent when they show the same relationship.

The table shows equivalent ratios. Each term of the ratio can be multiplied or divided by the same number to find equivalent ratios.

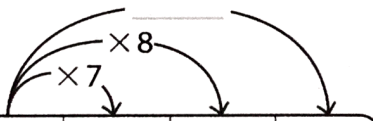
Number of Petals	5	10	15	20
Number of Flowers	1	2	3	4



Bruno correctly answered 4 questions out of every 5 questions on a test.

1. Write the ratio of questions that Bruno answered correctly to the number of questions on the test. _____ :
- 2. Make a table with equivalent ratios to find the number of questions that Bruno answered correctly if there were 45 questions on the test.

Number of Questions Correct	4			
Total Number of Questions	5			



There were _____ questions on the test. So, find the equivalent ratio with 45 as the second term.

3. If there were 45 questions on the test, then Bruno answered _____ questions correctly.

On the Back!

4. Write three ratios that are equivalent to $\frac{6}{9}$.

Name: _____

5-2 Additional Practice

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In 1–9, write three ratios that are equivalent to the given ratio.

1. $\frac{3}{5}$

2. $\frac{4}{8}$

3. $\frac{6}{18}$

4. 8:10

5. 6:8

6. 10:12

7. 12 to 18

8. 16 to 18

9. 5 to 25

In 10–15, use = or \neq to show whether the ratios are equivalent.

10. 3:12 6:24

11. $\frac{28}{16}$ $\frac{7}{4}$

12. 4 to 20 1 to 4

13. $\frac{4}{6}$ $\frac{6}{9}$

14. 27 to 9 24 to 4

15. 6:10 8:15

In 16 and 17, complete the tables with equivalent ratios.

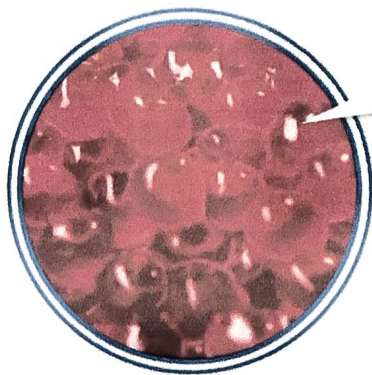
16. A wildlife conservancy maintains a ratio of 2 squirrels for every 8 birds. How many birds would there be if there were 15 squirrels?

Animals					
Squirrels	2	4	5	<input type="text"/>	15
Birds	8	<input type="text"/>	20	40	<input type="text"/>

17. At Rolling Hills Middle School, the ratio of the total number of students to the number of students with pets is 3 to 1. If there are 243 students at the school, how many students have pets?

Number of Students with Pets	1	3	9	<input type="text"/>	81
Total Number of Students	3	9	<input type="text"/>	81	<input type="text"/>

18. Scientists study ways to increase the population of wild salmon. How many salmon eggs may be needed to produce 18 adult salmon?

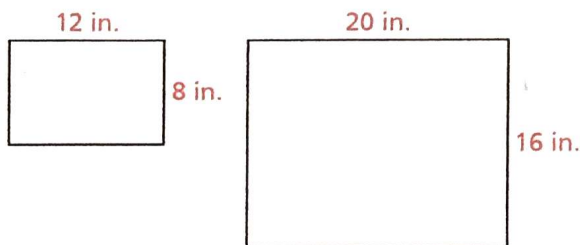


For every 8,000 eggs, only 2 adults may survive.

19. **Construct Arguments** Tell why you cannot multiply or divide by 0 to find equivalent ratios. © MP.3

20. **Critique Reasoning** Dale says the ratios 3:5 and 2:10 are equivalent. Is he correct? Explain. © MP.3

21. Is the ratio of length to width equivalent for these two rectangles? Explain.



22. **Higher Order Thinking** An animal shelter can hold a total of 60 cats and dogs. For every 5 cats the shelter can house, there is room for 7 dogs. How many cats and dogs are at the shelter when it is completely full?

23. **Be Precise** For a small music concert, each child in attendance will get a free toy trumpet. Five adults are expected for every 2 children. Find how many children are expected if there are 15 adults, 25 adults, and 40 adults. © MP.6

© Assessment Practice

24. In a section of a lake, there are 8 sailboats for every 6 motorboats. Which could be the number of sailboats and motorboats? Select all that apply.

- 14 sailboats, 12 motorboats
 24 sailboats, 18 motorboats
 32 sailboats, 24 motorboats
 4 sailboats, 2 motorboats
 4 sailboats, 3 motorboats

25. For every 8 boys in Kaley's class, there are 10 girls. Which could describe the students in Kaley's class? Select all that apply.

- 4 boys, 5 girls
 10 boys, 12 girls
 12 boys, 14 girls
 16 boys, 20 girls
 10 boys, 8 girls



Ratio tables can be used to compare different ratios. The comparisons can be used to solve problems.

1. Printer A prints 15 pages in 3 minutes. Complete the table with equivalent ratios.

Printer A					
Pages	15	30	45	60	
Time (min)	3	6			

Printer B prints 24 pages in 5 minutes. Complete the table with equivalent ratios.

Printer B					
Pages	24	48	72	96	
Time (min)	5	10			

2. If printer A and printer B were each used to print continuously for 15 minutes, how many pages would each printer print?

Printer A would print _____ pages in 15 minutes.

Printer B would print _____ pages in 15 minutes.

3. Which printer can print more pages in 15 minutes? _____

4. How long would it take each printer to print 120 pages?

Printer A would take _____ minutes to print 120 pages.

Printer B would take _____ minutes to print 120 pages.

5. Which printer is faster? _____

On the Back!

6. Laine and Maddie are practicing free throws. Laine makes 5 baskets for every 9 shots. Maddie makes 4 baskets for every 6 shots. If each girl attempts 36 shots, which girl makes more baskets? Complete ratio tables to solve.

Name: _____



PRACTICE



TUTORIAL

5-3 Additional Practice

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1. Edith and Rashida are shooting free throws. Complete the ratio tables. Who has a better ratio of baskets to shots?

Edith					Rashida						
Baskets	1	<input type="text"/>	<input type="text"/>	4	5	Baskets	2	<input type="text"/>	<input type="text"/>	8	10
Shots	3	6	9	<input type="text"/>	<input type="text"/>	Shots	5	10	15	<input type="text"/>	<input type="text"/>

2. In Mrs. Washington's class, there are 2 students in band for every 3 students in chorus. In Mr. Utley's class there are 5 students in band for every 7 students in chorus. Complete the ratio tables. Which class has a greater ratio of students in band to students in chorus?

Mrs. Washington's Class

Band	2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Chorus	3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Mr. Utley's Class

Band	5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Chorus	7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

3. Aiko has 5 shirts for every 3 pairs of pants. Her brother Haro has 7 shirts for every 4 pairs of pants. Complete the ratio tables. Which sibling has a greater ratio of shirts to pants?

Aiko

Shirts	5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Pants	3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Haro

Shirts	7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Pants	4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



In 4 and 5, complete the ratio tables to solve the problems.

4. **Model with Math** Every 5 days during the week, Morgan sleeps 40 hours. How many days would it take him to sleep 200 hours? © MP.4

Morgan's Sleep Ratio Table

Days	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Hours of Sleep	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

5. **Reasoning** Alice sleeps 50 hours every 6 days. Does Alice or Morgan have a greater days to hours of sleep ratio? Explain. © MP.2

Alice's Sleep Ratio Table

Days	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Hours of Sleep	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

6. Mrs. Henderson has 16 boys in her class of 24 students. Mr. Gregory has 18 boys in his class of 30 students. Which class has the greater ratio of boys to students? Explain.

7. **Higher Order Thinking** Jacob and Jordan are training for track season. Jacob did 39 sit-ups in 30 seconds. Jordan did 59 sit-ups in 50 seconds. Who will likely do more sit-ups in $2\frac{1}{2}$ minutes? Explain.

© Assessment Practice

8. Jan makes a party punch that requires 2 gallons of orange juice for every $\frac{1}{2}$ gallon of lemonade. Matt's favorite party punch recipe calls for 3 gallons of orange juice for every 2 gallons of pineapple juice.

PART A

Complete the ratio tables.

Jan's Party Punch

Orange Juice (gal)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Lemonade (gal)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Matt's Party Punch

Orange Juice (gal)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Pineapple Juice (gal)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

PART B

If Matt and Jan each make 10 gallons of punch, how many more gallons of orange juice would Jan use than Matt?



Equivalent ratios show the same relationship. You can multiply each term of a ratio by the same number to find an equivalent ratio.

To find equivalent ratios using a table, use repeated addition or repeated subtraction. The ratios from the table can then be graphed as points on a coordinate plane.

The bank offers Ryo an exchange rate of 5 U.S. dollars for every 4 British pounds.

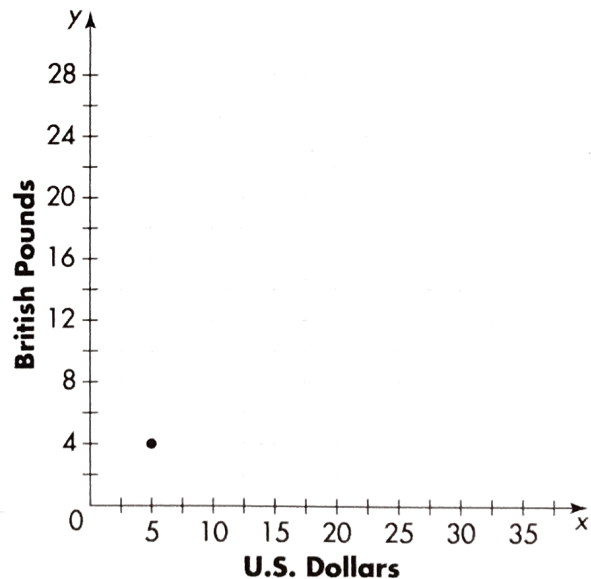
- Complete the table by writing equivalent ratios.

U.S. Dollars (x)	5	10	15	20	25	30
British Pounds (y)	4	8				

Based on the table, for 30 U.S. dollars Ryo gets _____ British pounds.

- On the coordinate plane, the ratio of 5 U.S. dollars to 4 British pounds is represented by the point (5, 4).

Plot the remaining pairs of values from the table on the coordinate plane. Draw a dashed line from (0, 0) to the edge of the graph to connect the points.
- How many British pounds can Ryo get for 35 U.S. dollars? Use the line to answer.



Find _____ on the x-axis, and move _____ until you reach your line to find the y-value, _____.

Ryo can get _____ British pounds for _____ U.S. dollars.

On the Back!

- Laura uses 3 balls of yarn to make 5 scarves. If Laura has 15 balls of yarn, how many scarves can she make? Make a table to find equivalent ratios. Then plot the pairs of values on a coordinate plane.

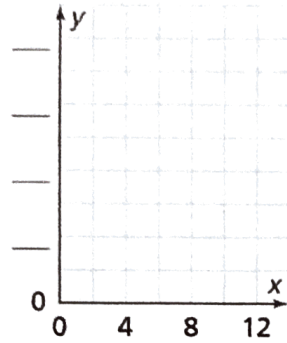
5-4 Additional Practice



In 1 and 2, complete each table. Then label the coordinates along the y-axis and plot the pairs of values on the coordinate plane.

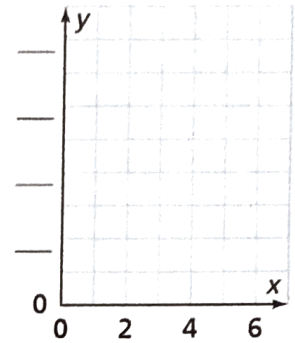
1.

2	4	6	8	10
3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



2.

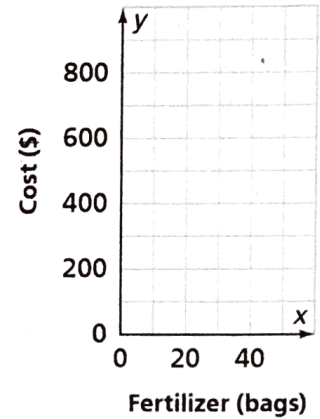
1	2	3	4	5
2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>



3. A store charges \$140 for every 10 bags of fertilizer a farmer buys.

a. Complete the table. Graph the values.

Fertilizer (bags)	10	<input type="text"/>	30	40	<input type="text"/>
Cost (\$)	140	280	<input type="text"/>	<input type="text"/>	840

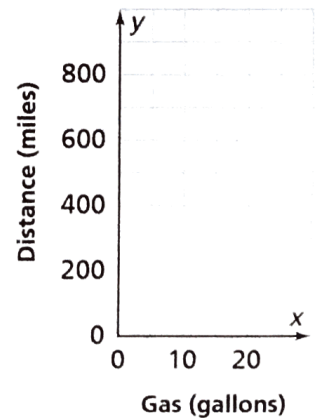


b. How much would a farmer pay for 50 bags of fertilizer? Explain.

4. A car uses 5 gallons of gas for every 120 miles it travels.

a. Complete the table. Graph the values.

Gas (gal)	5	<input type="text"/>	20
Distance (mi)	120	360	<input type="text"/>



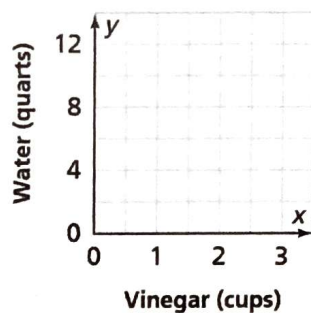
b. How many gallons of gas does the car use if it travels 600 miles?

c. How far can the car travel if it uses 30 gallons of gas?

5. Gavin makes a homemade cleaner using $\frac{1}{2}$ cup vinegar for every 2 quarts of water.

a. Complete the table. Graph the values.

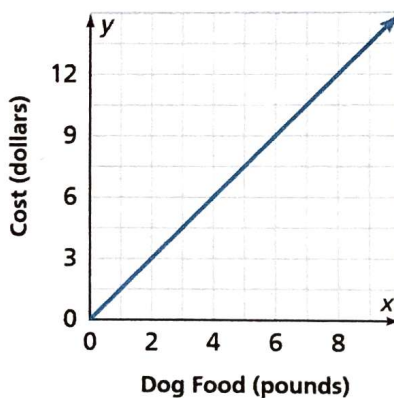
Vinegar (c)	$\frac{1}{2}$	<input type="text"/>	$1\frac{1}{2}$	<input type="text"/>
Water (qt)	2	4	<input type="text"/>	8



b. Use the graph to find out how much water Gavin would use with 3 cups of vinegar.

6. **Higher Order Thinking** Kallie makes bouquets of flowers so that the ratios are 4 carnations to 2 sunflowers to 3 lilies. Kallie makes a bouquet of 72 flowers using only these flowers. How many of each type of flower does she use?

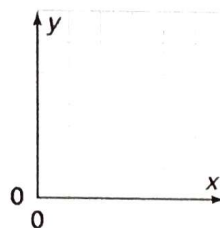
7. **Use Structure** The graph shows the relationship between the number of pounds of dog food bought and the cost of the dog food. What are the coordinates of the point that represents the cost of 6 pounds of dog food? © MP.7



© Assessment Practice

8. A restaurant pushes together 3 tables to seat 13 people. Complete the ratio table and plot the pairs of values on the coordinate plane to find how many tables are needed to seat up to 65 people using this pattern.

Tables	3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
People	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	65



Chapter 1

Who is one of the main character's best friends?

Who is Carl?

What type of dog is Tilly?

Chapter 2

What is "the Italian stallion"?

Who are Brady's neighbors?

Who told the boys to get off their property?

Chapter 3

What vehicle does Carl drive?

What is one physical trait used to describe Ben?

What class is Brady in when he called down to the office?

Chapter 4

Who picks Brady up from school to look for Ben?

What is the weather like as Brady searches for Ben?

Who calls to say that they found Mrs. DiAngelo alive?

What color is Ben's life jacket?