EUREKA MATH

A STORY OF UNITS

Mathematics Curriculum

Grade 3 • MODULE 1

Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10

PROBLEM SETS

Video tutorials: http://embarc.online

Version 3

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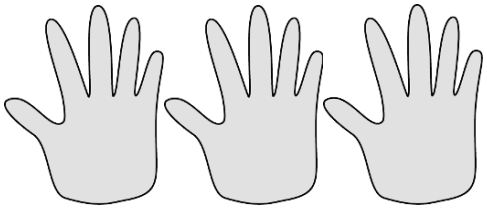
GRADE 3 • MODULE 1

Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10

Name _____ Date _____

1. Fill in the blanks to make true statements.



a. 3 groups of five = _____

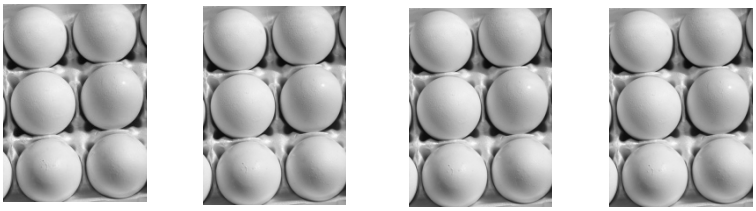
3 fives = _____

3 × 5 = _____

b. 3 + 3 + 3 + 3 + 3 = _____

5 groups of three = _____

5 × 3 = _____



c. 6 + 6 + 6 + 6 = _____

_____ groups of six = _____

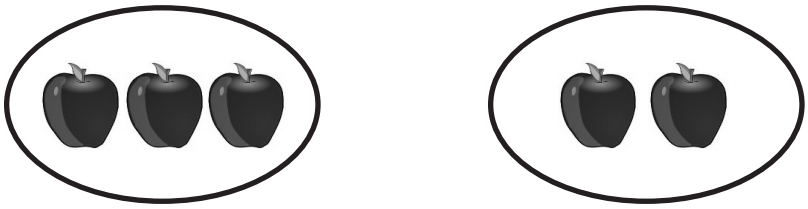
4 × _____ = _____

d. 4 +____ + ____ + ____ + ____ + ____ = _____

6 groups of _____ = _____

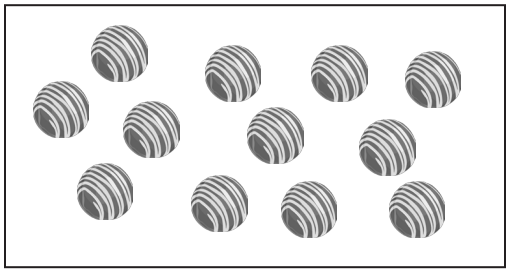
6 × _____ = _____

2. The picture below shows 2 groups of apples. Does the picture show 2 × 3? Explain why or why not.



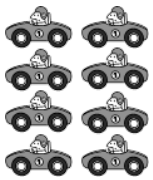
3. Draw a picture to show 2 × 3 = 6.

4. Caroline, Brian, and Marta share a box of chocolates. They each get the same amount. Circle the chocolates below to show 3 groups of 4. Then, write a repeated addition sentence and a multiplication sentence to represent the picture.



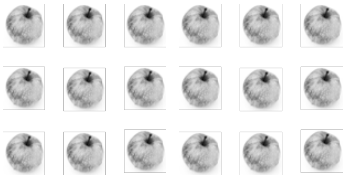
Name _____ Date _____

Use the arrays below to answer each set of questions.

1. 

a. How many rows of cars are there? _____

b. How many cars are there in each row? _____

2. 

a. What is the number of rows? _____

b. What is the number of objects in each row? _____

3. 

a. There are 4 spoons in each row. How many spoons are in 2 rows? _____

b. Write a multiplication expression to describe the array. _____

4. 

a. There are 5 rows of triangles. How many triangles are in each row? _____

b. Write a multiplication expression to describe the total number of triangles.

_____

5. The dots below show 2 groups of 5.

a. Redraw the dots as an array that shows 2 rows of 5.

b. Compare the drawing to your array. Write at least 1 reason why they are the same and 1 reason why they are different.

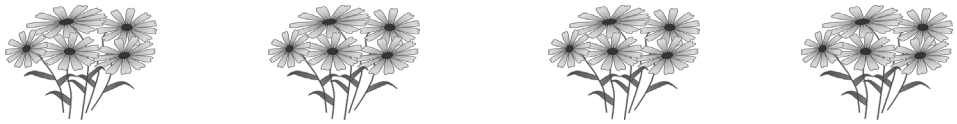
6. Emma collects rocks. She arranges them in 4 rows of 3. Draw Emma's array to show how many rocks she has altogether. Then, write a multiplication equation to describe the array.

7. Joshua organizes cans of food into an array. He thinks, "My cans show 5 × 3!" Draw Joshua's array to find the total number of cans he organizes.

Name _____ Date _____

Solve Problems 1–4 using the pictures provided for each problem.

1. There are 5 flowers in each bunch. How many flowers are in 4 bunches?

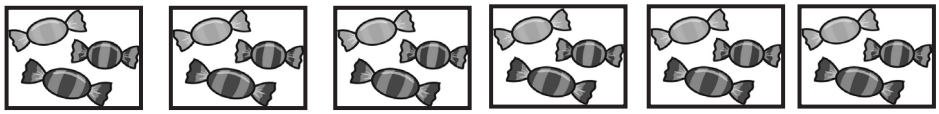


a. Number of groups: _____ Size of each group: _____

b. 4 × 5 = _____

c. There are _____ flowers altogether.

2. There are _____ candies in each box. How many candies are in 6 boxes?

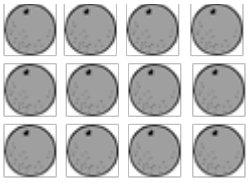


a. Number of groups: _____ Size of each group: _____

b. 6 × _____ = _____

c. There are _____ candies altogether.

3. There are 4 oranges in each row. How many oranges are there in _____ rows?

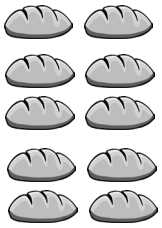


a. Number of rows: _____ Size of each row: _____

b. _____ × 4 = _____

c. There are _____ oranges altogether.

4. There are _____ loaves of bread in each row. How many loaves of bread are there in 5 rows?



a. Number of rows: _____ Size of each row: _____

b. _____ × _____ = _____

c. There are _____ loaves of bread altogether.

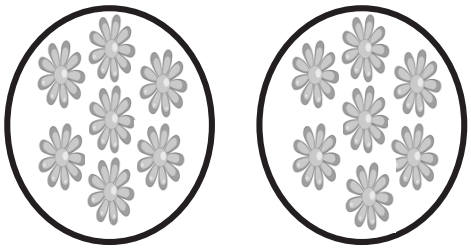
5. a. Write a multiplication equation for the array shown below.

X X X
X X X
X X X
X X X

b. Draw a number bond for the array where each part represents the amount in one row.

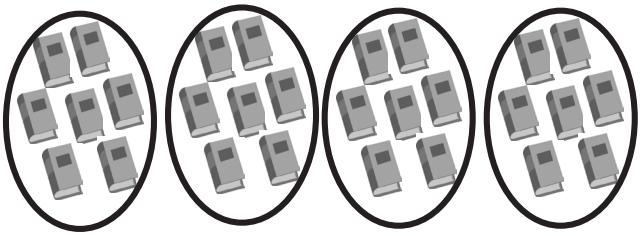
6. Draw an array using factors 2 and 3. Then, show a number bond where each part represents the amount in one row.

Name _____ Date _____

1. 

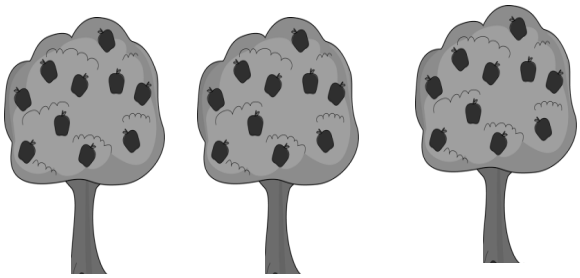
14 flowers are divided into 2 equal groups.

There are _____ flowers in each group.

2. 

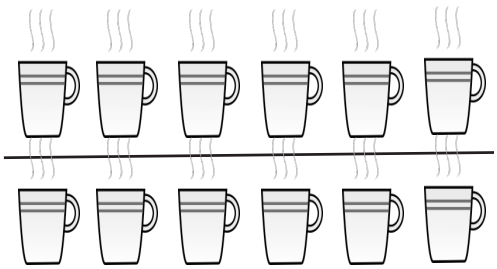
28 books are divided into 4 equal groups.

There are _____ books in each group.

3. 

30 apples are divided into _____ equal groups.

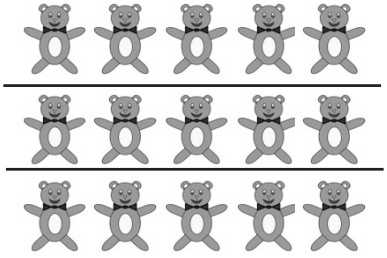
There are _____ apples in each group.

4. 

_____ cups are divided into _____ equal groups.

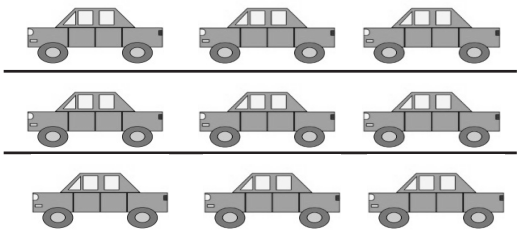
There are _____ cups in each group.

12 ÷ 2 = _____

5. 

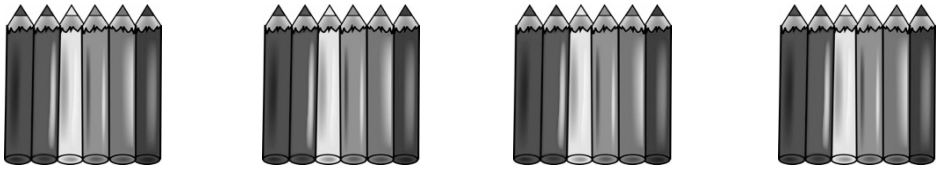
There are _____ toys in each group.

15 ÷ 3 = _____

6. 

9 ÷ 3 = _____

7. Audrina has 24 colored pencils. She puts them in 4 equal groups. How many colored pencils are in each group?



There are _____ colored pencils in each group.

24 ÷ 4 = _____

8. Charlie picks 20 apples. He divides them equally between 5 baskets. Draw the apples in each basket.

There are _____ apples in each basket.

20 ÷ _____ = _____

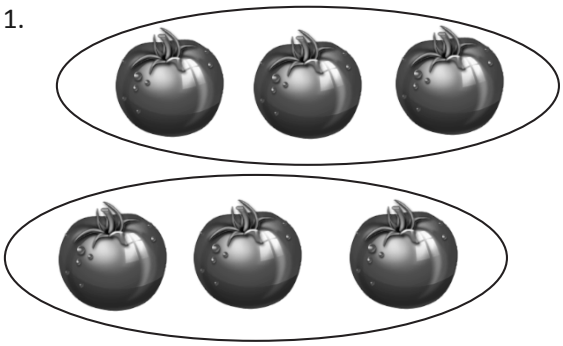
9. Chelsea collects butterfly stickers. The picture shows how she placed them in her book. Write a division sentence to show how she equally grouped her stickers.

There are _____ butterflies in each row.

_____ ÷ _____ = _____

Name _____ Date _____

1.



Divide 6 tomatoes into groups of 3.

There are _____ groups of 3 tomatoes.

6 ÷ 3 = 2

2.

Divide 8 lollipops into groups of 2.

There are _____ groups.

8 ÷ 2 = _____

3.

Divide 10 stars into groups of 5.

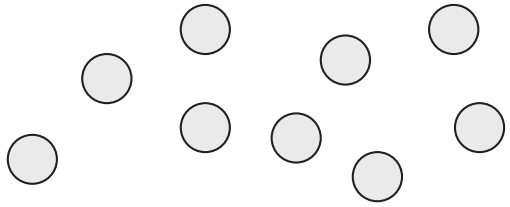
10 ÷ 5 = _____

4.

Divide the shells to show 12 ÷ 3 = _____, where the unknown represents the number of groups.

How many groups are there? _____

5. Rachel has 9 crackers. She puts 3 crackers in each bag. Circle the crackers to show Rachel's bags.



a. Write a division sentence where the answer represents the number of Rachel's bags.

b. Draw a number bond to represent the problem.

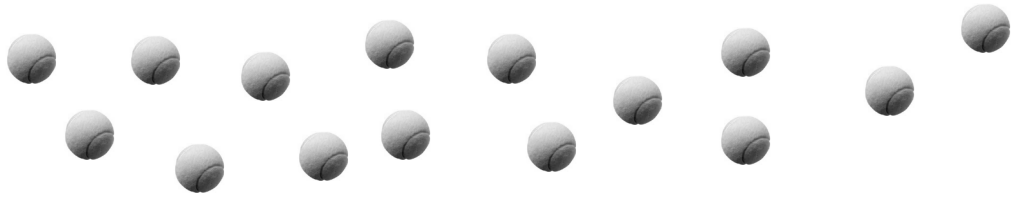
6. Jameisha has 16 wheels to make toy cars. She uses 4 wheels for each car.

a. Use a count-by to find the number of cars Jameisha can build. Make a drawing to match your counting.

b. Write a division sentence to represent the problem.

Name _____ Date _____

1. Rick puts 15 tennis balls into cans. Each can holds 3 balls. Circle groups of 3 to show the balls in each can.



Rick needs _____ cans.

_____ × 3 = 15

15 ÷ 3 = _____

2. Rick uses 15 tennis balls to make 5 equal groups. Draw to show how many tennis balls are in each group.

There are _____ tennis balls in each group.

5 × _____ = 15

15 ÷ 5 = _____

3. Use an array to model Problem 1.

a. _____ × 3 = 15

15 ÷ 3 = _____

The number in the blanks represents

_____.

b. 5 × _____ = 15

15 ÷ 5 = _____

The number in the blanks represents

_____.

4. Deena makes 21 jars of tomato sauce. She puts 7 jars in each box to sell at the market. How many boxes does Deena need?

   21 ÷ 7 = _____

   _____ × 7 = 21

   What is the meaning of the unknown factor and quotient? _____

5. The teacher gives the equation 4 × ____ = 12. Charlie finds the answer by writing and solving 12 ÷ 4 = ____. Explain why Charlie's method works.

6. The blanks in Problem 5 represent the size of the groups. Draw an array to represent the equations.

Name _____ Date _____

1. a. Draw an array that shows 6 rows of 2.

   b. Write a multiplication sentence where the first factor represents the number of rows.

   _____ × _____ = _____

2. a. Draw an array that shows 2 rows of 6.

   b. Write a multiplication sentence where the first factor represents the number of rows.

   _____ × _____ = _____

3. a. Turn your paper to look at the arrays in Problems 1 and 2 in different ways. What is the same and what is different about them?

   b. Why are the factors in your multiplication sentences in a different order?

4. Write a multiplication sentence for each expression. You might skip-count to find the totals.

   a. 6 twos: 6 × 2 = 12

   b. 2 sixes: _____

   c. 7 twos: _____

   d. 2 sevens: _____

   e. 9 twos: _____

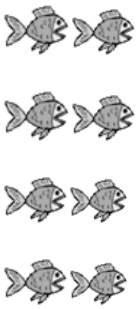
   f. 2 nines: _____

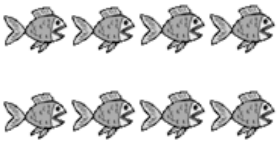
   Extension:

   g. 11 twos: _____

   h. 2 twelves: _____

5. Write and solve multiplication sentences where the second factor represents the size of the row.

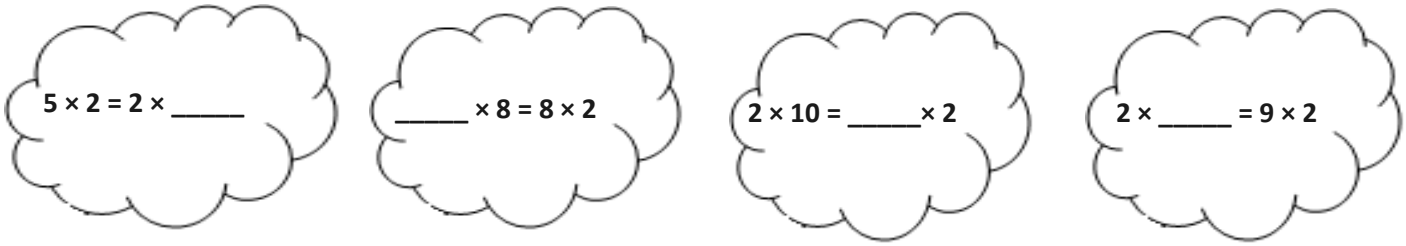




_____ _____

6. Ms. Nenadal writes 2 × 7 = 7 × 2 on the board. Do you agree or disagree? Draw arrays to help explain your thinking.

7. Find the missing factor to make each equation true.



8. Jada gets 2 new packs of erasers. Each pack has 6 erasers in it.
   a. Draw an array to show how many erasers Jada has altogether.

   b. Write and solve a multiplication sentence to describe the array.

   c. Use the commutative property to write and solve a different multiplication sentence for the array.

Name _____ Date _____

1. Draw an array that shows 5 rows of 3.

2. Draw an array that shows 3 rows of 5.

3. Write multiplication expressions for the arrays in Problems 1 and 2. Let the first factor in each expression represent the number of rows. Use the commutative property to make sure the equation below is true.

_____ × _____ = _____ × _____

Problem 1 **Problem 2**

4. Write a multiplication sentence for each expression. You might skip-count to find the totals. The first one is done for you.

a. 2 threes: 2 × 3 = 6

b. 3 twos: _____

c. 3 fours: _____

d. 4 threes: _____

e. 3 sevens: _____

f. 7 threes: _____

g. 3 nines: _____

h. 9 threes: _____

i. 10 threes: _____

5. Find the unknowns that make the equations true. Then, draw a line to match related facts.

a. 3 + 3 + 3 + 3 + 3 = _____

b. 3 × 9 = _____

c. 7 threes + 1 three = _____

d. 3 × 8 = _____

e. _____ = 5 × 3

f. 27 = 9 × _____

6. Isaac picks 3 tangerines from his tree every day for 7 days.

   a. Use circles to draw an array that represents the tangerines Isaac picks.

   b. How many tangerines does Isaac pick in 7 days? Write and solve a multiplication sentence to find the total.

   c. Isaac decides to pick 3 tangerines every day for 3 more days. Draw x's to show the new tangerines on the array in Part (a).

   d. Write and solve a multiplication sentence to find the total number of tangerines Isaac picks.

7. Sarah buys bottles of soap. Each bottle costs $2.

   a. How much money does Sarah spend if she buys 3 bottles of soap?

   _____ × _____ = $_____

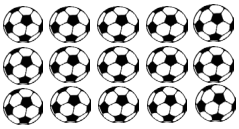
   b. How much money does Sarah spend if she buys 6 bottles of soap?

   _____ × _____ = $_____

Name _____ Date _____

1. The team organizes soccer balls into 2 rows of 5. The coach adds 3 rows of 5 soccer balls. Complete the equations to describe the total array.

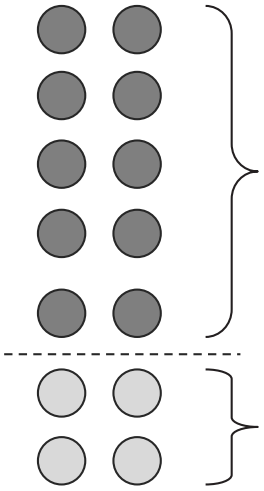
a. (5 + 5) + (5 + 5 + 5) = _____



b. 2 fives + _____ fives = _____ fives

c. _____ × 5 = _____

2. 7 × 2 = _____



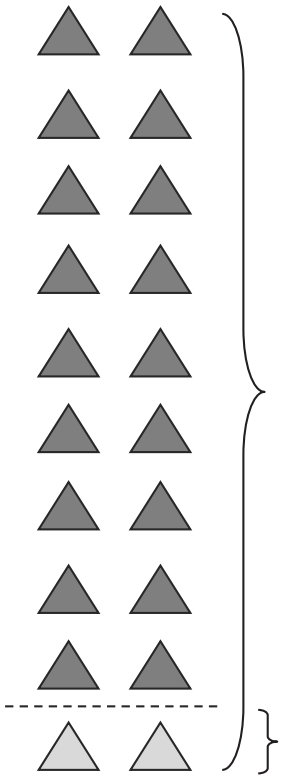
5 × 2 = ___

2 × 2 = ___

10 + 4 = _____

_____ × 2 = 14

3. 9 × 2 = _____



10 × 2 = ___

1 × 2 = ___

20 – _____ = 18

9 × 2 = _____

4. Matthew organizes his baseball cards in 4 rows of 3.

   a. Draw an array that represents Matthew's cards using an x to show each card.

   b. Solve the equation to find Matthew's total number of cards. 4 × 3 = _____

5. Matthew adds 2 more rows. Use circles to show his new cards on the array in Problem 4(a).

   a. Write and solve a multiplication equation to represent the circles you added to the array.

   _____ × 3 = _____

   b. Add the totals from the equations in Problems 4(b) and 5(a) to find Matthew's total cards.

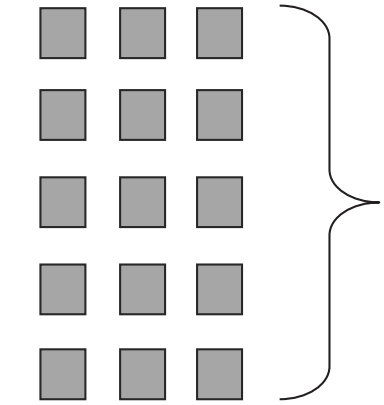
   _____ + _____ = 18

   c. Write the multiplication equation that shows Matthew's total number of cards.

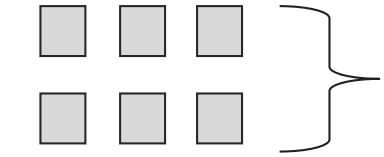
   _____ × _____ = 18

Name _____ Date _____

1. $7 \times 3 = (5 \times 3) + (2 \times 3) =$ _____



$(5 \times 3) = 15$

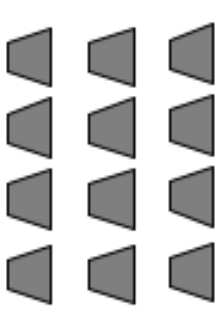


$(2 \times 3) =$ _____

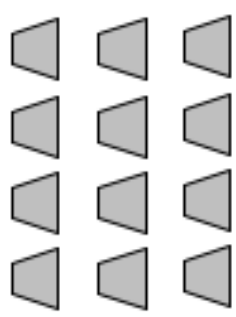
$(5 \times 3) + (2 \times 3) = 15 +$ _____

$15 +$ _____ = _____

2. $8 \times 3 = (4 \times 3) + (4 \times 3) =$ _____



(_____ × 3) = _____



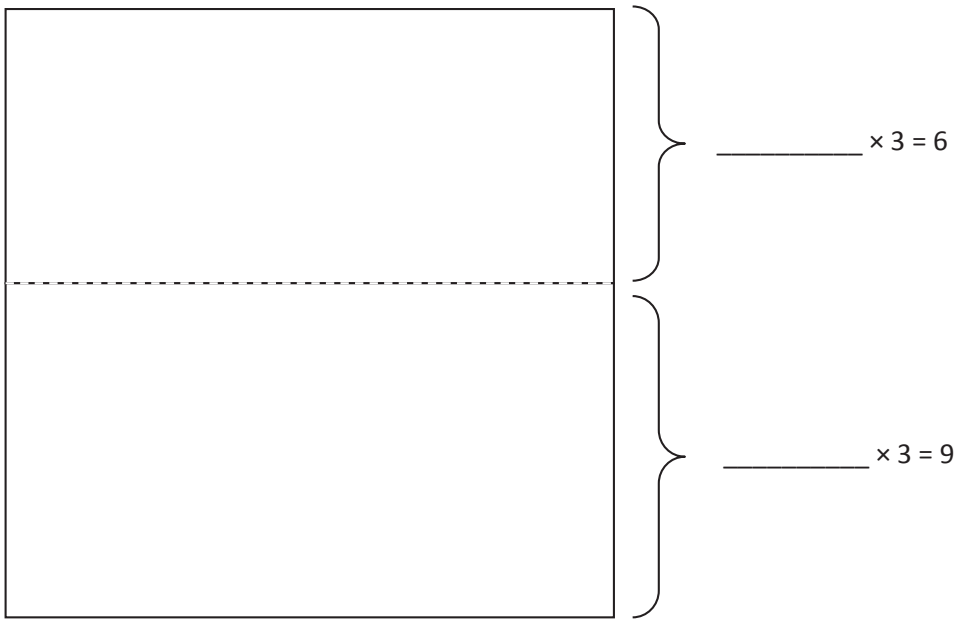
(_____ × 3) = _____

$(4 \times 3) + (4 \times 3) =$ _____ + _____

_____ × 3 = _____

3. Ruby makes a photo album. One page is shown below. Ruby puts 3 photos in each row.

   a. Fill in the equations on the right. Use them to help you draw arrays that show the photos on the top and bottom parts of the page.



   b. Ruby calculates the total number of photos as shown below. Use the array you drew to help explain Ruby's calculation.

5 × 3 = 6 + 9 = 15

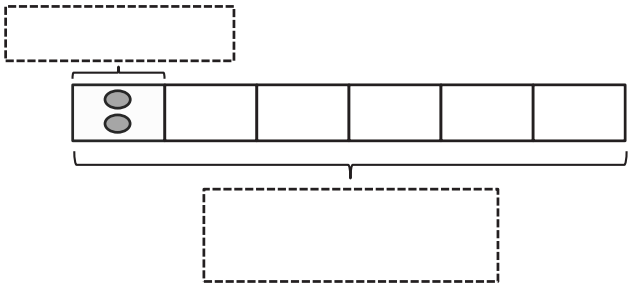
Name _____ Date _____

1. Mrs. Prescott has 12 oranges. She puts 2 oranges in each bag. How many bags does she have?

   a. Draw an array where each column shows a bag of oranges.

   _____ ÷ 2 = _____

   b. Redraw the oranges in each bag as a unit in the tape diagram. The first unit is done for you. As you draw, label the diagram with known and unknown information from the problem.



2. Mrs. Prescott arranges 18 plums into 6 bags. How many plums are in each bag? Model the problem with both an array and a labeled tape diagram. Show each column as the number of plums in each bag.

There are _____ plums in each bag.

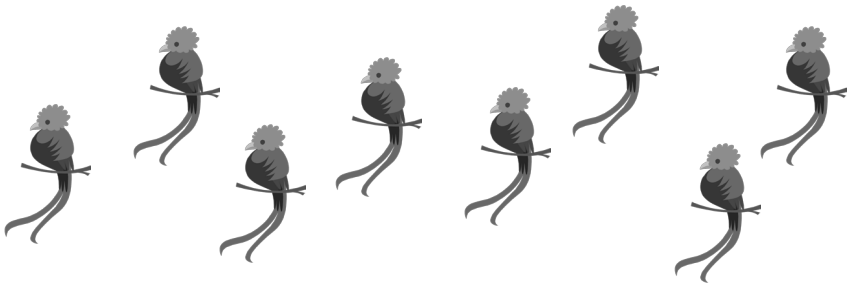
3. Fourteen shopping baskets are stacked equally in 7 piles. How many baskets are in each pile? Model the problem with both an array and a labeled tape diagram. Show each column as the number of baskets in each pile.

4. In the back of the store, Mr. Prescott packs 24 bell peppers equally into 8 bags. How many bell peppers are in each bag? Model the problem with both an array and a labeled tape diagram. Show each column as the number of bell peppers in each bag.

5. Olga saves $2 a week to buy a toy car. The car costs $16. How many weeks will it take her to save enough to buy the toy?

Name _____ Date _____

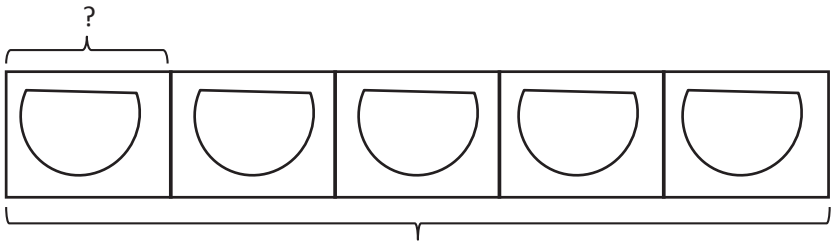
1. There are 8 birds at the pet store. Two birds are in each cage. Circle to show how many cages there are.



8 ÷ 2 = _____

There are _____ cages of birds.

2. The pet store sells 10 fish. They equally divide the fish into 5 bowls. Draw fish to find the number in each bowl.

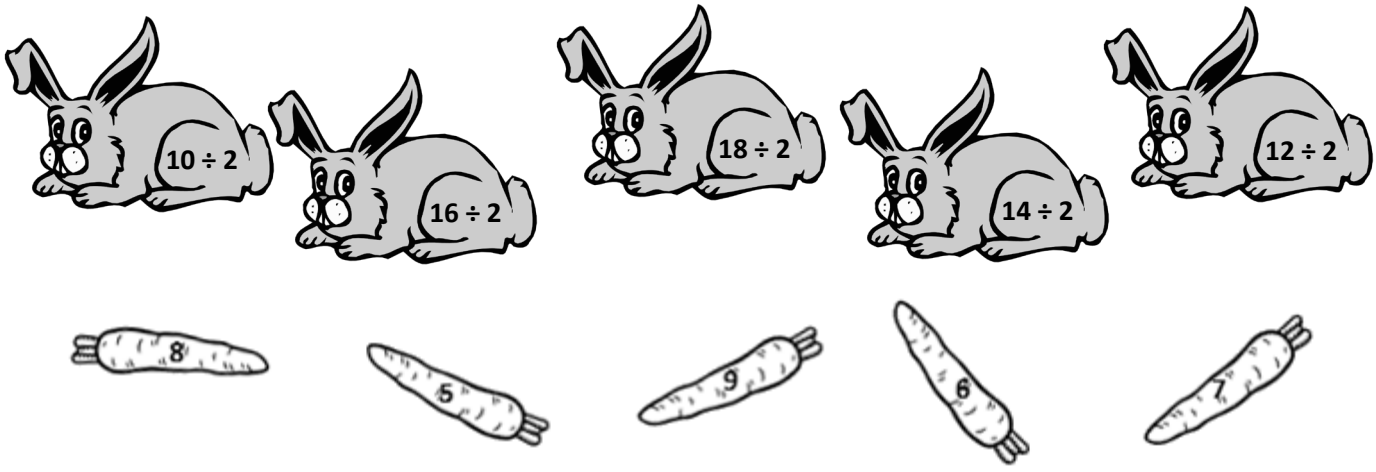


5 × _____ = 10

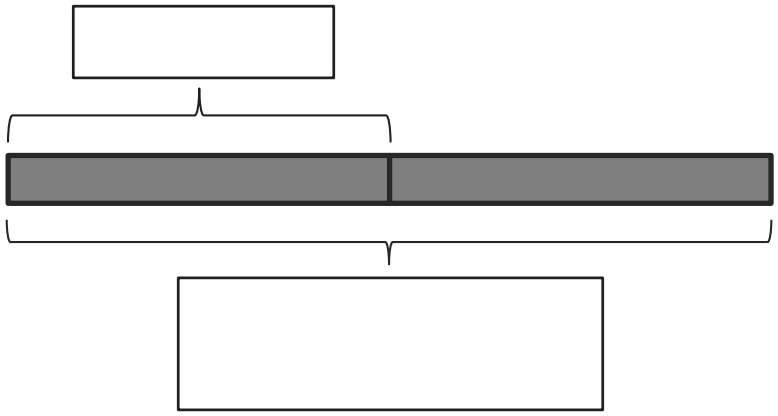
10 ÷ 5 = _____

There are _____ fish in each bowl.

3. Match.



4. Laina buys 14 meters of ribbon. She cuts her ribbon into 2 equal pieces. How many meters long is each piece? Label the tape diagram to represent the problem, including the unknown.



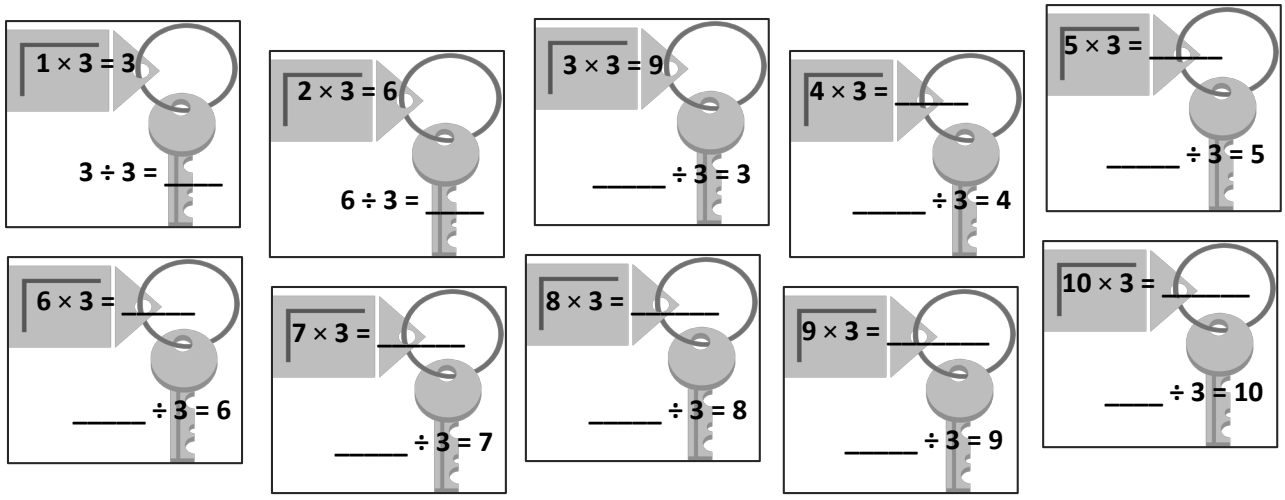
Each piece is _____ meters long.

5. Roy eats 2 cereal bars every morning. Each box has a total of 12 bars. How many days will it take Roy to finish 1 box?

6. Sarah and Esther equally share the cost of a present. The present costs $18. How much does Sarah pay?

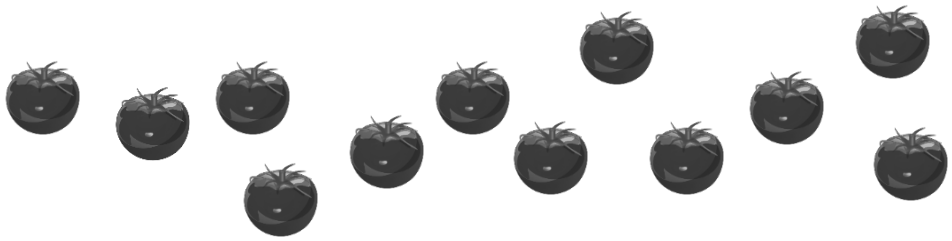
Name _____ Date _____

1. Fill in the blanks to make true number sentences.



2. Mr. Lawton picks tomatoes from his garden. He divides the tomatoes into bags of 3.

   a. Circle to show how many bags he packs. Then, skip-count to show the total number of tomatoes.



   b. Draw and label a tape diagram to represent the problem.

_____ ÷ 3 = _____

Mr. Lawton packs _____ bags of tomatoes.

3. Camille buys a sheet of stamps that measures 15 centimeters long. Each stamp is 3 centimeters long. How many stamps does Camille buy? Draw and label a tape diagram to solve.

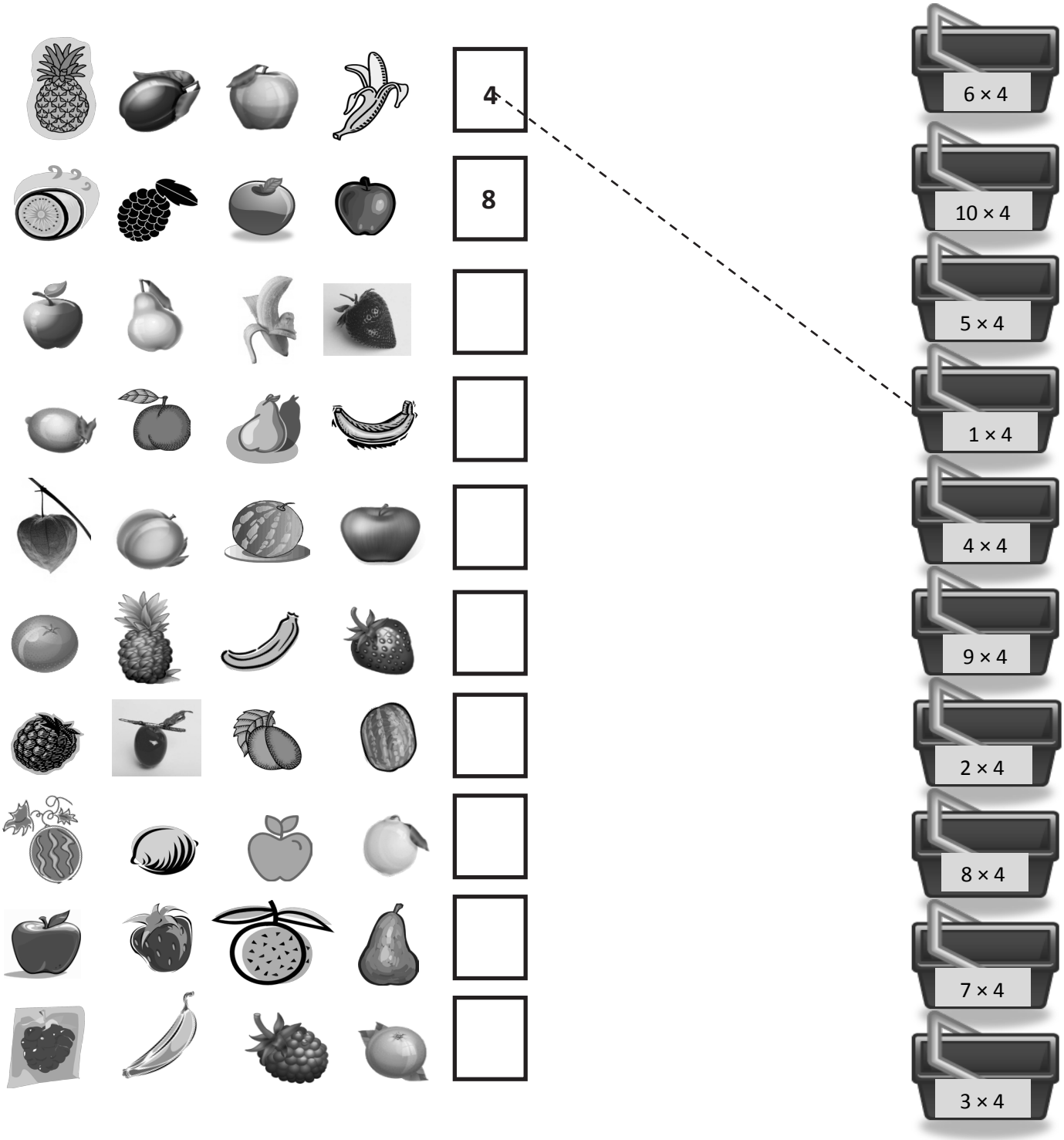
Camille buys _____ stamps.

4. Thirty third-graders go on a field trip. They are equally divided into 3 vans. How many students are in each van?

5. Some friends spend $24 altogether on frozen yogurt. Each person pays $3. How many people buy frozen yogurt?

Name _____ Date _____

1. Skip-count by fours. Match each answer to the appropriate expression.



2. Mr. Schmidt replaces each of the 4 wheels on 7 cars. How many wheels does he replace? Draw and label a tape diagram to solve.

Mr. Schmidt replaces _____ wheels.

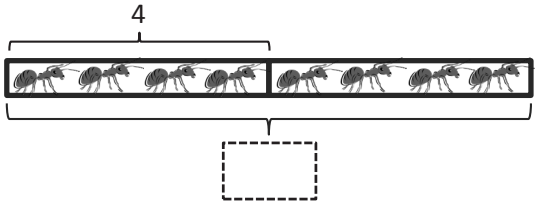
3. Trina makes 4 bracelets. Each bracelet has 6 beads. Draw and label a tape diagram to show the total number of beads Trina uses.

4. Find the total number of sides on 5 rectangles.

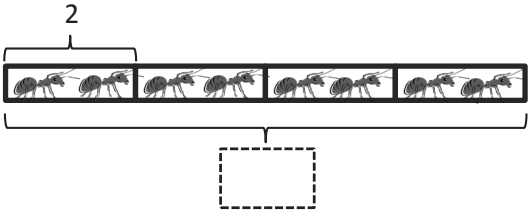
Name _____ Date _____

1. Label the tape diagrams and complete the equations. Then, draw an array to represent the problems.

a.

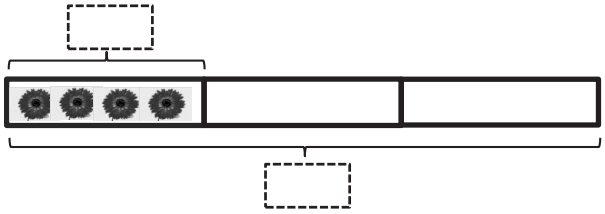


2 × 4 = _____

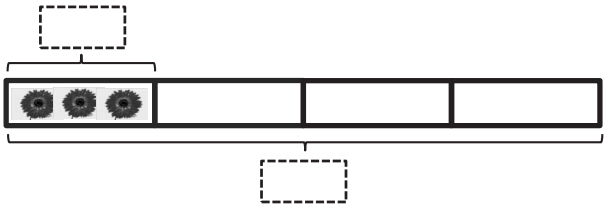


4 × 2 = _____

b.

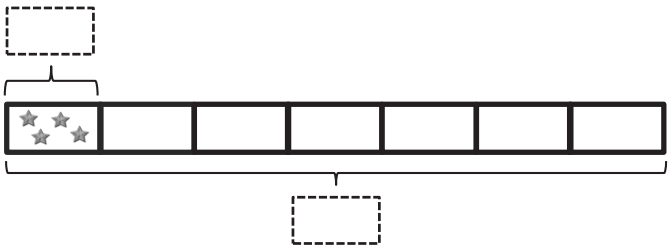


_____ × 4 = _____

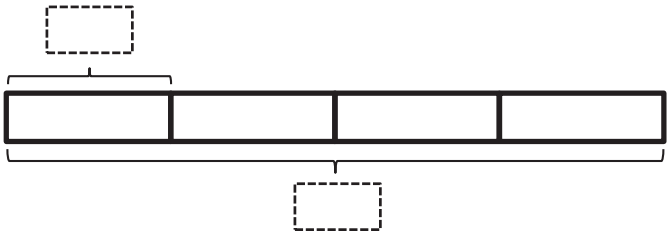


4 × _____ = _____

c.



_____ × _____ = 28



_____ × _____ = 28

2. Draw and label 2 tape diagrams to model why the statement in the box is true.

$4 \times 6 = 6 \times 4$

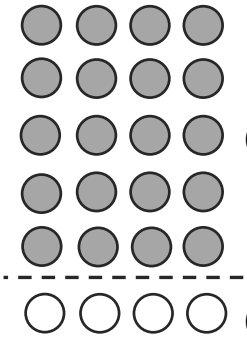
3. Grace picks 4 flowers from her garden. Each flower has 8 petals. Draw and label a tape diagram to show how many petals there are in total.

4. Michael counts 8 chairs in his dining room. Each chair has 4 legs. How many chair legs are there altogether?

Name _____ Date _____

1. Label the array. Then, fill in the blanks below to make true number sentences.

a. **6 × 4 = _____**



(5 × 4) = 20

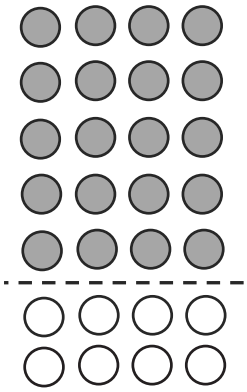
(1 × 4) = _____

(6 × 4) = (5 × 4) + (1 × 4)

= 20 + _____

= _____

b. **7 × 4 = _____**



(5 × 4) = _____

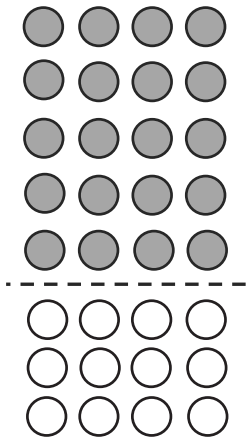
(2 × 4) = _____

(7 × 4) = (5 × 4) + (2 × 4)

= _____ + _____

= 28

c. **8 × 4 = _____**



(5 × 4) = _____

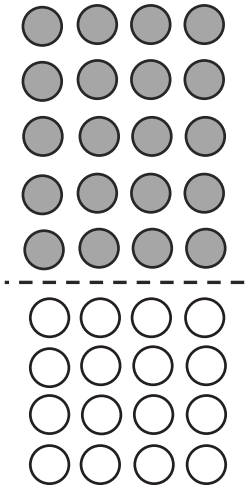
(____ × 4) = _____

(8 × 4) = (5 × 4) + (____ × 4)

= _____ + _____

= _____

d. **9 × 4 = _____**



(5 × 4) = _____

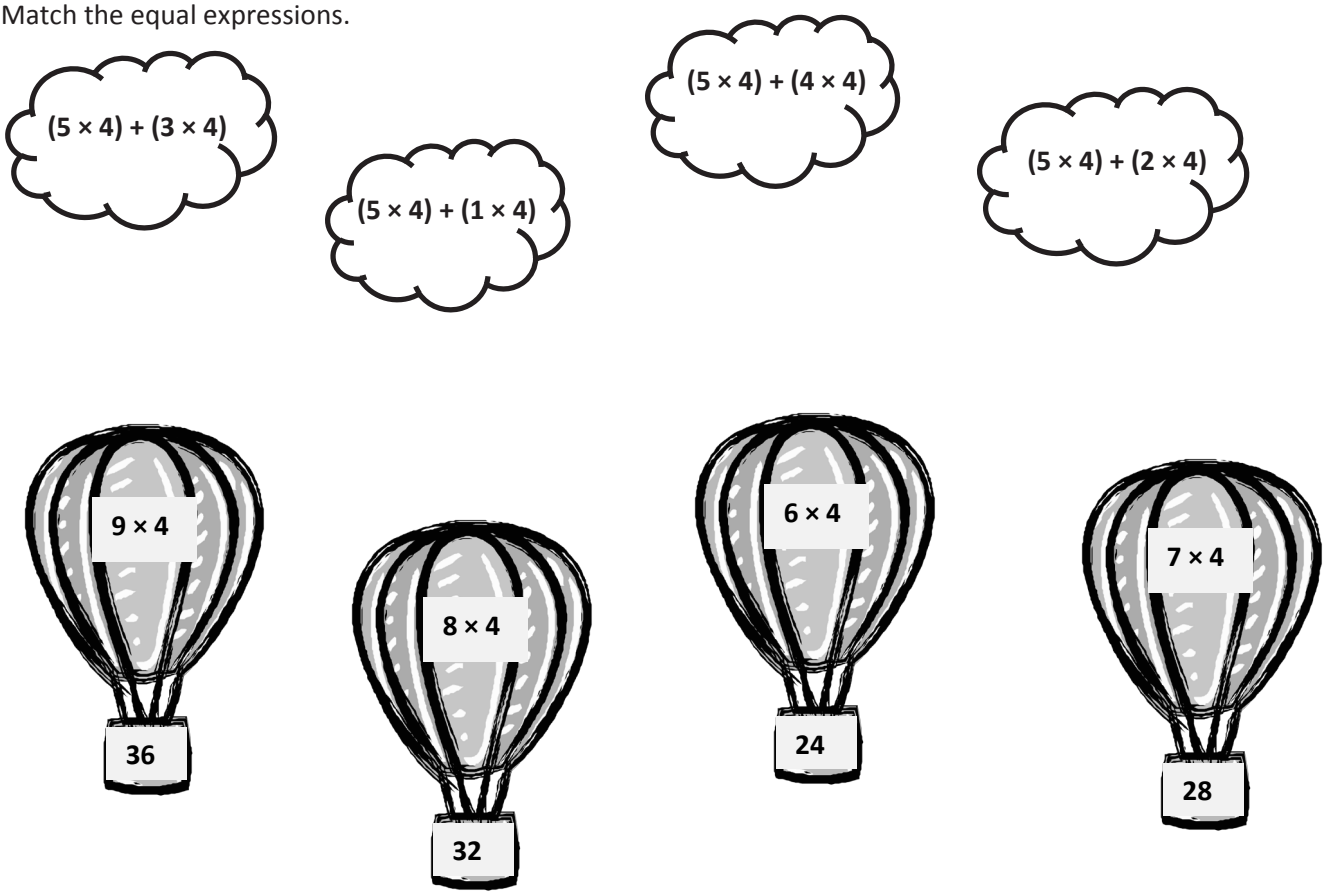
(____ × 4) = _____

(9 × 4) = (5 × 4) + (____ × 4)

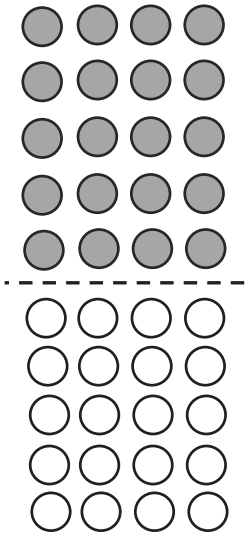
= _____ + _____

= _____

2. Match the equal expressions.



3. Nolan draws the array below to find the answer to the multiplication expression 10 × 4. He says, "10 × 4 is just double 5 × 4." Explain Nolan's strategy.



Name _____ Date _____

1. Use the array to complete the related equations.

$1 \times 4 =$ 4 $\quad$ 4 $\div 4 = 1$

$2 \times 4 =$ _____ $\quad$ _____ $\div 4 = 2$

_____ $\times 4 = 12$ $\quad 12 \div 4 =$ _____

_____ $\times 4 = 16$ $\quad 16 \div 4 =$ _____

_____ $\times$ _____ $= 20$ $\quad 20 \div$ _____ $=$ _____

_____ $\times$ _____ $= 24$ $\quad 24 \div$ _____ $=$ _____

_____ $\times 4 =$ _____ $\quad$ _____ $\div 4 =$ _____

_____ $\times 4 =$ _____ $\quad$ _____ $\div 4 =$ _____

_____ $\times$ _____ $=$ _____ $\quad$ _____ $\div$ _____ $=$ _____

_____ $\times$ _____ $=$ _____ $\quad$ _____ $\div$ _____ $=$ _____

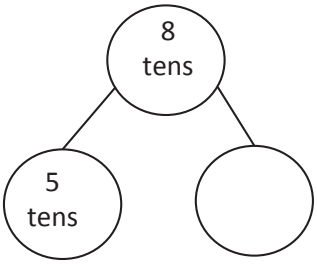
2. The baker packs 36 bran muffins in boxes of 4. Draw and label a tape diagram to find the number of boxes he packs.

3. The waitress arranges 32 glasses into 4 equal rows. How many glasses are in each row?

4. Janet paid $28 for 4 notebooks. Each notebook costs the same amount. What is the cost of 2 notebooks?

Name _____ Date _____

1. 8 × 10 = _____



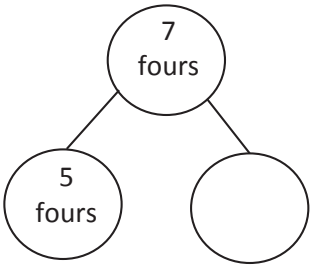
5 tens + _____ = 8 tens

(5 × 10) + (_____ × 10) = 8 × 10

50 + _____ = _____

8 × 10 = _____

2. 7 × 4 = _____



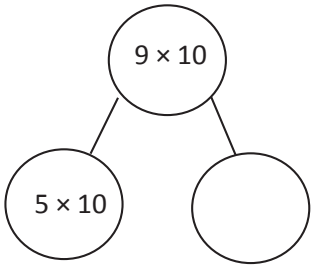
5 fours + _____ = 7 fours

(5 × 4) + (_____ × 4) = 7 × 4

20 + _____ = _____

7 × 4 = _____

3. 9 × 10 = _____



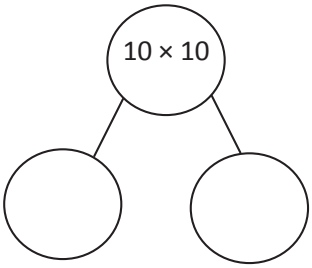
5 tens + _____ = 9 tens

(5 × 10) + (_____ × 10) = 9 × 10

_____ + _____ = _____

9 × 10 = _____

4. 10 × 10 = _____



_____ + _____ = 10 tens

(_____ × 10) + (_____ × 10) = 10 × 10

_____ + _____ = _____

10 × 10 = _____

5. There are 7 teams in the soccer tournament. Ten children play on each team. How many children are playing in the tournament? Use the break apart and distribute strategy, and draw a number bond to solve.

There are _____ children playing in the tournament.

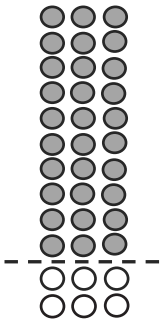
6. What is the total number of sides on 8 triangles?

7. There are 12 rows of bottled drinks in the vending machine. Each row has 10 bottles. How many bottles are in the vending machine?

Name _____ Date _____

1. Label the array. Then, fill in the blanks to make true number sentences.

a. 36 ÷ 3 = _____



(30 ÷ 3) = _____

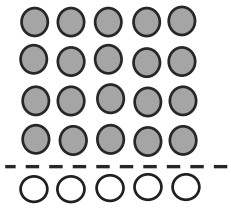
(6 ÷ 3) = _____

(36 ÷ 3) = (30 ÷ 3) + (6 ÷ 3)

= 10 + _____

= 12

b. 25 ÷ 5 = _____



(20 ÷ 5) = 4

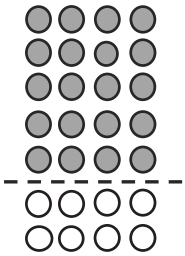
(5 ÷ 5) = _____

(25 ÷ 5) = (20 ÷ 5) + (5 ÷ 5)

= 4 + _____

= _____

c. 28 ÷ 4 = _____



(20 ÷ 4) = _____

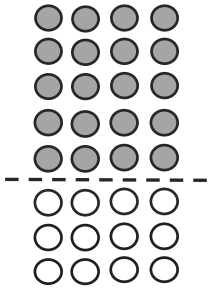
(_____ ÷ 4) = _____

(28 ÷ 4) = (20 ÷ 4) + (_____ ÷ 4)

= _____ + _____

= _____

d. 32 ÷ 4 = _____



(_____ ÷ 4) = _____

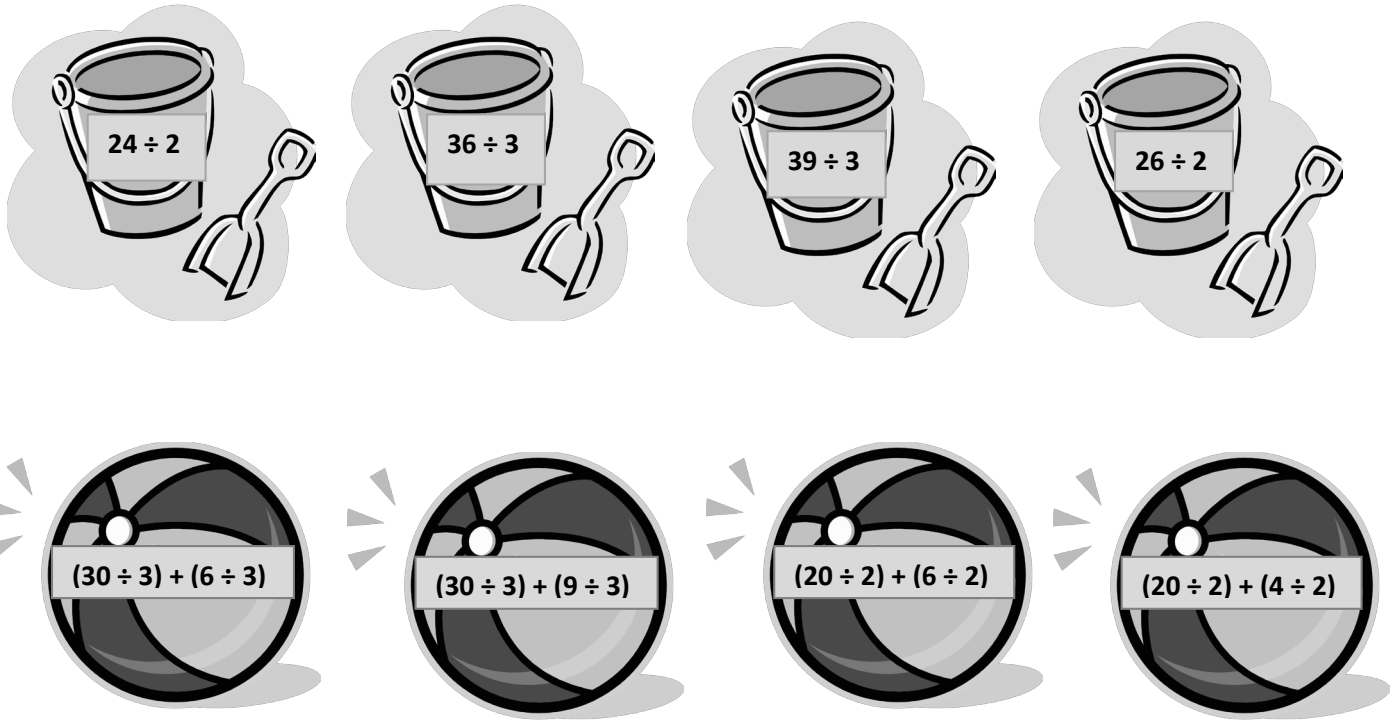
(_____ ÷ 4) = _____

(32 ÷ 4) = (_____ ÷ 4) + (_____ ÷ 4)

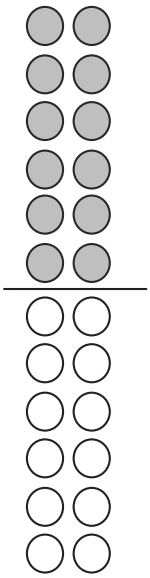
= _____ + _____

= _____

2. Match the equal expressions.

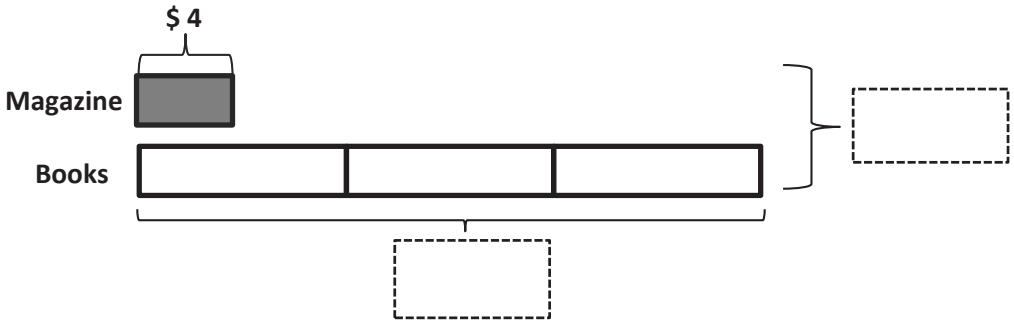


3. Nell draws the array below to find the answer to 24 ÷ 2. Explain Nell's strategy.



Name _____ Date _____

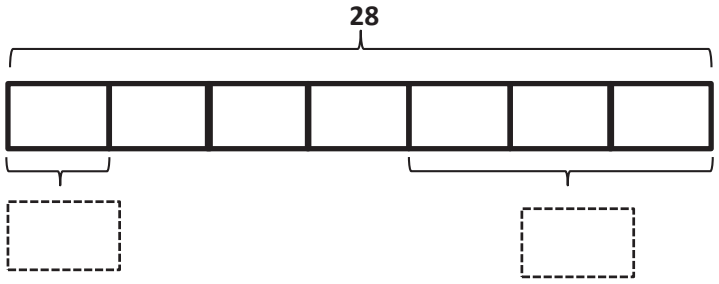
1. Ted buys 3 books and a magazine at the book store. Each book costs $8. A magazine costs $4.



a. What is the total cost of the books?

b. How much does Ted spend altogether?

2. Seven children share 28 silly bands equally.



a. How many silly bands does each child get?

b. How many silly bands do 3 children get?

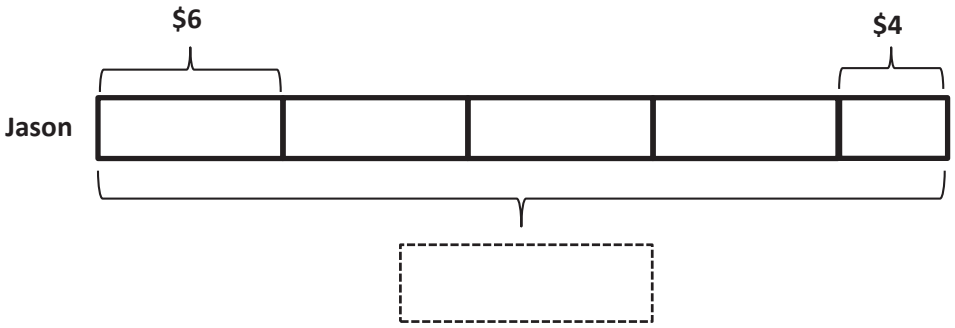
3. Eighteen cups are equally packed into 6 boxes. Two boxes of cups break. How many cups are unbroken?

4. There are 25 blue balloons and 15 red balloons at a party. Five children are given an equal number of each color balloon. How many blue and red balloons does each child get?

5. Twenty-seven pears are packed in bags of 3. Five bags of pears are sold. How many bags of pears are left?

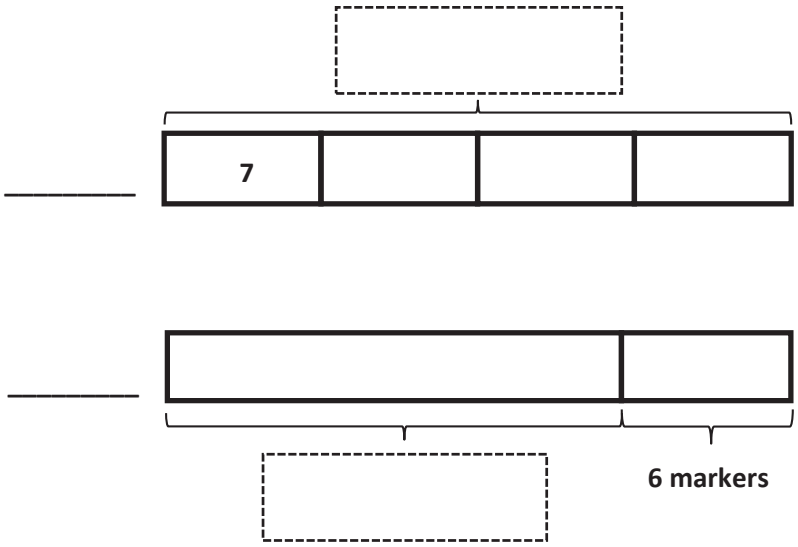
Name _____ Date _____

1. Jason earns $6 per week for doing all his chores. On the fifth week, he forgets to take out the trash, so he only earns $4. Write and solve an equation to show how much Jason earns in 5 weeks.



Jason earns _____.

2. Miss Lianto orders 4 packs of 7 markers. After passing out 1 marker to each student in her class, she has 6 left. Label the tape diagram to find how many students are in Miss Lianto's class.



There are _____ students in Miss Lianto's class.

3. Orlando buys a box of 18 fruit snacks. Each box comes with an equal number of strawberry-, cherry-, and grape-flavored snacks. He eats all of the grape-flavored snacks. Draw and label a tape diagram to find how many fruit snacks he has left.

4. Eudora buys 21 meters of ribbon. She cuts the ribbon so that each piece measures 3 meters in length.

   a. How many pieces of ribbon does she have?

   b. If Eudora needs a total of 12 pieces of the shorter ribbon, how many more pieces of the shorter ribbon does she need?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