1. Fill in the blanks to make true statements.

a. 3 groups of five = \[\text{15}\]
   \[3 \text{ fives} = \text{15}\]
   \[3 \times 5 = \text{15}\]

b. \[3 + 3 + 3 + 3 + 3 = \text{15}\]
   \[5 \text{ groups of three} = \text{15}\]
   \[5 \times 3 = \text{15}\]

c. \[\frac{12}{4} \div \frac{12}{4} = \text{24}\]
   \[\frac{6 + 6 + 6 + 6}{4} = \text{24}\]
   \[4 \times \frac{6}{6} = \text{24}\]

d. \[\frac{4 + 4 + 4 + 4 + 4}{4} = \text{24}\]
   \[\frac{6 \text{ groups of 4}}{4} = \text{24}\]
   \[6 \times \frac{4}{4} = \text{24}\]
2. The picture below shows 2 groups of apples. Does the picture below show \(2 \times 3\)? Explain why or why not.

No. The groups are not equal.

3. Draw a picture to show \(2 \times 3 = 6\).

4. Caroline, Brian and Marta want to share a box of chocolates so that they each get the same amount.

Circle the chocolates below to show 3 groups of 4. Then write addition and multiplication sentences to represent the problem.

\[
4 + 4 + 4 = 12 \\
3 \times 4 = 12
\]
Use the arrays below to answer each set of questions.

1. a. How many rows of cars are there? 4
   b. How many cars are there in each row? 2

2. a. What is the number of rows? 3
   b. What is the number of objects in each row? 6

3. a. There are 4 spoons in each row. How many spoons are in 2 rows? 8
   b. Write a multiplication expression to describe the array. $2 \times 4 = 8$

4. a. There are 5 rows of triangles. How many triangles are in each row? 4
   b. Write a multiplication expression to describe the total number of triangles. $5 \times 4 = 20$
5. The dots below show 2 groups of 5.
   a. Redraw the circles as an array that shows 2 rows of 5.
      \[2 \times 5\]

   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 sentence to describe the array.
   \[4 \times 3 = 12\]

7. Joshua helps his father organize cans of food in the cupboard. He makes an array with the cans and thinks, “My cans show \(5 \times 3\)!" Make a drawing that shows how many cans are in Joshua’s array.
Solve numbers 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: 4
   b. $4 \times 5 = 20$
   c. There are 20 flowers altogether.

2. There are 3 candies in each box. How many candies are in 6 boxes?
   a. Number of groups: 6
   b. $6 \times 3 = 18$
   c. There are 18 candies altogether.

3. There are 4 oranges in each row. How many oranges are there in 3 rows?
   a. Number of rows: 3
   b. $3 \times 4 = 12$
   c. There are 12 oranges altogether.
4. There are \( \underline{2} \) loaves of bread in each row. How many loaves of bread are there in 5 rows?

a. Number of rows: \( \underline{5} \)  
Size of each row: \( \underline{2} \)

b. \( 5 \times 2 = 10 \)

c. There are \( \underline{10} \) loaves of bread altogether.

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

\[
\begin{array}{c} \\
XXX \\
XXX \\
XXX \\
XXX \\
\end{array}
\]

\( 4 \times 3 = 12 \)

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

\[
\begin{array}{c} \\
12 \\
\text{shows} \\
\end{array}
\]

\[
\begin{array}{c} \\
3 \\
3 \\
3 \\
\end{array}
\]

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

\[
\begin{array}{c} \\
2 \times 3 = 6 \\
\text{factors} \\
\end{array}
\]

\[
\begin{array}{c} \\
6 \\
3 \\
\end{array}
\]
1. Divide 14 flowers into 2 equal groups. There are ___ flowers in each group.

2. Divide 28 books into 4 equal groups. There are ___ books in each group.
   \[ \frac{28}{4} = 7 \]

3. Divide 30 apples into ___ equal groups. There are ___ apples in each group.
   \[ \frac{30}{3} = 10 \]

4. Divide 12 cups into ___ equal groups. There are ___ cups in each group.
   \[ \frac{12}{2} = 6 \]

5. There are ___ toys in each group.
   \[ \frac{15}{3} = 5 \]

6. Total groups in each group:
   \[ \frac{9}{3} = 3 \]
7. Audrina has 24 colored pencils. She puts them in 4 equal groups. How many colored pencils are in each group?

There are \( \frac{24}{4} \) colored pencils in each group.

\[
24 \div 4 = 6
\]

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

There are \( \frac{20}{5} \) apples in each basket.

\[
20 \div 5 = 4
\]

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 \( \frac{15}{3} \) butterflies in each row.

\[
15 \div 3 = 5
\]
1. Divide 6 tomatoes into groups of 3.
   There are \( \frac{6}{3} = 2 \) groups of 3 tomatoes.

2. Divide 8 lollipops into groups of 2.
   There are \( \frac{8}{2} = 4 \) groups.

3. Divide 10 stars into groups of 5.
   \( \frac{10}{5} = 2 \)

4. Divide the shells to show \( \frac{12}{3} = 4 \),
   where the unknown represents the number of groups.
   How many groups are there? \( \frac{4}{ } \)
5. Rachel has 9 crackers. She puts 3 crackers in each bag. Circle the crackers to show Rachel's bags.

![Diagram of 3 groups of 3 crackers]

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

   \[ 9 \div 3 = 3 \]

b. Draw a number bond to represent the problem.

   ![Number bond diagram]

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.

   \[ 4, 8, 12, 16 \]

   ![Drawing of 4 groups of 4 wheels]

b. Write a division sentence to represent the problem.

   \[ 16 \div 4 = 4 \]
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 5 cans.

\[ 5 \times 3 = 15 \]
\[ 15 \div 3 = 5 \]

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

There are 3 tennis balls in each group.

\[ 5 \times 3 = 15 \]
\[ 15 \div 5 = 3 \]

3. Use an array to model Problem 1.

a) \[ 5 \times 3 = 15 \]
\[ 15 \div 3 = 5 \]

The number in the blanks represents: # of groups

b) \[ 5 \times 3 = 15 \]
\[ 15 \div 5 = 3 \]

The number in the blanks represents: # in group \& size of the group

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

\[
\begin{align*}
21 \div 7 &= 3 \\
3 \times 7 &= 21
\end{align*}
\]

What is the meaning of the unknown factor and quotient? 

5. The teacher gives the problem \[4 \times \_ \_ = 12\]. Charlie finds the answer by writing and solving \[12 \div 4 = \_ \_\]. Explain why Charlie's method works.

\[
\begin{align*}
12 \div 4 &= 3 \\
\text{Both problems have 4 groups of 3.} \\
\text{The quotient in a ÷ problem is like the unknown factor in the \times problem.}
\end{align*}
\]

6. The blanks in Problem 5 represent the size of the groups. Draw an array to represent the number sentences.
Lesson 7 Problem Set

1. a. Count by twos 6 times.
   \[2, 4, 6, 8, 10, 12\]
   b. Draw an array to match your count-by.
   [Array diagram]
   c. Write an equation to represent the total number of objects in your array.
   \[6 \times 2 = 12\]

2. a. Count by sixes 2 times.
   \[6, 12\]
   b. Draw an array to match your count-by.
   [Array diagram]
   c. Write an equation to represent the total number of objects in your array.
   \[2 \times 6 = 12\]

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?
   same array - just turned or flipped.
   b. Why are the factors in your equations in a different order?
   \# 1 6 groups of 2
   \# 2 2 groups of 6
   The factors are in a different order because of the way they are grouped.

4. Skip-count to find the total for each expression. Write an equation to match your count-by. The first one is done for you.
   a. 6 twos: \[6 \times 2 = 12\]
   b. 2 sixes: \[2 \times 6 = 12\]
   c. 7 twos: \[7 \times 2 = 14\]
   d. 2 sevens: \[2 \times 7 = 14\]
   e. 9 twos: \[9 \times 2 = 18\]
   f. 2 nines: \[2 \times 9 = 18\]
   g. 11 twos: \[11 \times 2 = 22\]
   h. 2 twelves: \[2 \times 12 = 24\]

EUREKA MATH

| Lesson 7: Demonstrate the commutativity of multiplication, and practice related facts by skip counting objects in array models
| Date: 5/23/14

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5. Write and solve a different equation to describe each array.

\[
\begin{align*}
\text{fish} & \quad \text{fish} \\
\text{fish} & \quad \text{fish} \\
\text{fish} & \quad \text{fish} \\
\text{fish} & \quad \text{fish} \\
4 \times 2 & = 8 \\
2 \times 4 & = 8
\end{align*}
\]

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

Agree, because the factors did not change. They just switched places. Commutative Property!!

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

\[
\begin{align*}
5 \times 2 & = 2 \times 5 \\
2 \times 8 & = 8 \times 2 \\
2 \times 10 & = 10 \times 2 \\
2 \times 9 & = 9 \times 2
\end{align*}
\]

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.

\[\begin{array}{cccccccc}
\text{O} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O} \\
\text{O} & \text{O} & \text{O} & \text{O} & \text{O} & \text{O}
\end{array}\]

b. Write and solve an equation to describe the array.

\[2 \times 6 = 12\]

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

\[6 \times 2 = 12\]
1. a. Count by threes 5 times.
   $\begin{array}{c}
   3 \ 6 \ 9 \ 12 \ 15
   \end{array}$

   b. Draw an array that matches your count-by.
   $\begin{array}{cccc}
   \ & \ & \ & \ \\
   \ & O \ O \ O & & \\
   \ & O \ O \ O & & \\
   \ & O \ O & & \\
   \ & O & & \\
   \end{array}$

2. a. Count by fives 3 times.
   $\begin{array}{c}
   5 \ 10 \ 15
   \end{array}$

   b. Draw an array that matches your count-by.
   $\begin{array}{cccc}
   \ & \ & \ & \ \\
   \ & O \ O \ O & & \\
   \ & O \ O \ O & & \\
   \ & O \ O \ O & & \\
   \ & O \ O \ O & & \\
   \end{array}$

3. Write multiplication expressions below to represent your arrays in Problems 1 and 2. Use the commutative property to make the equation true.

   $5 \times 3 = 3 \times 5$
   
   Problem 1

   Problem 2

4. Count by the unit the number in word form the number of times indicated. Write the multiplication sentence that matches your count by. The first one is done for you.
   a. 2 threes: $2 \times 3 = 6$
   b. 3 twos: $3 \times 2 = 6$
   c. 3 fours: $3 \times 4 = 12$
   d. 4 threes: $4 \times 3 = 12$
   e. 3 sevens: $3 \times 7 = 21$
   f. 7 threes: $7 \times 3 = 21$
   g. 3 nines: $3 \times 9 = 27$
   h. 9 threes: $9 \times 3 = 27$
   i. 10 threes: $10 \times 3 = 30$

5. Find the unknowns that make the number sentences true. Then draw a line to match facts that are related.
   a. $3 + 3 + 3 + 3 = 15$
   b. $3 \times 9 = 27$
   c. $7 \times 3 + 1 \times 3 = 21 + 3$
   d. $3 \times 8 = 24$
   e. $15 = 5 \times 3 = 4$
   f. $27 = 9 \times 3$
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.

   ![Array of circles representing tangerines]

   ![Diagram of circles arranged in an array]

   - How many tangerines does Isaac pick in 7 days? Write and solve a multiplication sentence.
     \[ 7 \times 3 = 21 \]

   - 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.

   - Write and solve a multiplication sentence to find the total number of tangerines Isaac picks.
     \[ 10 \times 3 = 30 \]
     The total # of tangerines is 30.

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

   \[ 3 \times 2 = 6 \]

   ![Diagram of soap bottles]

   - How much money does she spend if she buys 6 bottles of soap?

   \[ 6 \times 2 = 12 \]
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. \((5 + 5) + (5 + 5 + 5) = \underline{25}\)

   b. 2 fives + \underline{3} fives = \underline{25} fives

   c. \underline{5} \times 5 = \underline{25}

2. \(7 \times 2 = \underline{14}\)

3. \(9 \times 2 = \underline{18}\)

   \(10 + 4 = \underline{14}\)

   \(7 \times 2 = 14\)

   \(10 \times 2 = \underline{20}\)

   \(1 \times 2 = \underline{2}\)

   \(20 - \underline{2} = 18\)

   \(9 \times 2 = \underline{18}\)
   a. Draw an array that represents Matthew’s cards using an x to show each card.
      \[
      \begin{array}{c}
      \times \times \times \\
      \times \times \times \\
      \times \times \times \\
      \times \times \times \\
      \end{array}
      \]
      \[
      \begin{array}{c}
      \circ \circ \circ \\
      \circ \circ \circ \\
      \end{array}
      \]
   b. Solve the equation to find Matthew’s total number of cards. \[4 \times 3 = \underline{12}\]

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.
      \[\underline{2} \times 3 = \underline{6}\]
   b. Add the totals from the equations in Problems 4(b) and 5(a) to find Matthew’s total cards.
      \[12 + 6 = 18\]
   c. Write the multiplication equation that shows Matthew’s total number of cards.
      \[\underline{6} \times \underline{3} = 18\]
Lesson 10: Model the distributive property with arrays to decompose units as a strategy to multiply.

Date: 5/23/14

1. $7 \times 3 = (5 \times 3) + (2 \times 3) = \frac{21}{15} + \frac{6}{15} = 21$

   \[
   \begin{array}{cccccccc}
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   \end{array}
   \]
   \[
   (5 \times 3) = 15
   \]
   \[
   \begin{array}{cccccccc}
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   \end{array}
   \]
   \[
   (2 \times 3) = 6
   \]
   \[
   (5 \times 3) + (2 \times 3) = 15 + 6
   \]
   \[
   15 + 6 = 21
   \]

2. $8 \times 3 = (4 \times 3) + (4 \times 3) = \frac{24}{12} + \frac{12}{12} = 24$

   \[
   \begin{array}{cccccccc}
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   \end{array}
   \]
   \[
   (4 \times 3) = 12
   \]
   \[
   \begin{array}{cccccccc}
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   & & & & & & & \\
   \end{array}
   \]
   \[
   (4 \times 3) = 12
   \]
   \[
   (4 \times 3) + (4 \times 3) = 12 + 12
   \]
   \[
   8 \times 3 = 24
   \]
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.

Ruby did not know the answer to $5 \times 3$ so she broke it into 2 smaller facts. $2 \times 3 = 6$ and $3 \times 3 = 9$. Then she added $6 + 9$. So $5 \times 3 = 15$. And $6 + 9 = 15$. That means $5 \times 5 = 6 + 9 = 15$. 

Lesson 10: Model the distributive property with arrays to decompose units as a strategy to multiply.

Date: 5/23/14
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.
      
      \[ \text{She has 6 bags.} \]
      
      \[ \Rightarrow \frac{12}{2} = 6 \]
   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.
      
      \[
      \begin{array}{c}
      \hline
      \text{1 bag} & \text{2 oranges} \\
      \hline
      \end{array}
      \]
      
      \[
      \begin{array}{cccccc}
      \hline
      1 & 2 & 3 & 4 & 5 & 6 \\
      \hline
      \end{array}
      \]
      
      \[ \Rightarrow \text{There are 3 plums in each bag.} \]

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.
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.

There are 2 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.

There are 3 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?

It will take her 8 weeks.

\[16 \div 2 = 8\]

2, 4, 6, 8, 10, 12, 14, 16

1 2 3 4 5 6 7 8
1. There are 8 birds at the pet store. Two birds are in each cage. Circle to show how many cages there are.

\[ 8 \div 2 = 4 \]

There are 4 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.

\[ 5 \times 2 = 10 \]

\[ 10 \div 5 = 2 \]

There are 2 fish in each bowl.

3. Match.

- \[ 10 \div 2 = 5 \]
- \[ 16 \div 2 = 8 \]
- \[ 18 \div 2 = 9 \]
- \[ 14 \div 2 = 7 \]
- \[ 12 \div 2 = 6 \]
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.

\[ 14 \div 2 = 7 \]

Each piece is \( \frac{7}{2} \) 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?

\[ 12 \div 2 = 6 \]

It will take 6 days to finish 1 box of 12 bars.

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

\[ 18 \div 2 = 9 \]

Sarah pays $9.
1. Complete the related expressions.

- $1 \times 3 = 3$
- $2 \times 3 = 6$
- $3 \times 3 = 9$
- $4 \times 3 = 12$
- $5 \times 3 = 15$

- $3 \div 3 = 1$
- $6 \div 3 = 2$
- $9 \div 3 = 3$
- $10 \div 3 = 3 \ldots$
- $18 \div 3 = 6$
- $21 \div 3 = 7$
- $24 \div 3 = 8$
- $27 \div 3 = 9$
- $30 \div 3 = 10$

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.

- 3, 6, 9, 12
- 12 total tomatoes

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

- 4 bags
- 12 tomatoes
- $12 \div 3 = 4$

Mr. Lawton packs 4 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.

\[ 15 \div 3 = 5 \]

Camille buys 5 stamps.

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

\[ 30 \div 3 = 10 \]

There are 10 kids in each van.

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

\[ 24 \div 3 = 8 \]

8 people buy yogurt.
1. Skip-count by fours. Match the answers to the appropriate multiplication problem.
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.

\[ 7 \times 4 = 28 \]

Mr. Schmidt replaces 28 wheels altogether.

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.

\[ 4 \times 6 = 24 \]

The total of the beads is 24.

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

\[ 5 \times 4 = 20 \]

There are 20 total sides.
1. Label the tape diagrams and complete the equations. Then draw an array to represent the problems.

a. 

\[ 2 \times 4 = 8 \]

\[ 4 \times 2 = 8 \]

b. 

\[ 3 \times 4 = 12 \]

\[ 4 \times 3 = 12 \]

c. 

\[ 7 \times 4 = 28 \]

\[ 4 \times 7 = 28 \]
2. Draw and label 2 tape diagrams to model how the statement in the box is true.

\[ 4 \times 6 = 24 \]

- **Group:** 6 objects
- **2 groups**
- **24 objects**

\[ 6 \times 4 = 24 \]

- **Group:** 4 objects
- **6 groups**
- **24 objects**

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.

- **1 flower**
  - **8 petals**
- **4 flowers**
  - **32 petals**

\[ 4 \times 8 = 32 \]

There are 32 petals in all.

\[ 8 + 8 + 8 + 8 = 32 \]

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

- **1 chair**
  - **4 legs**
- **8 chairs**
  - **32 legs**

\[ 8 \times 4 = 32 \]

There are 32 legs in all.

\[ 4, 8, 12, 16, 20, 24, 28, 32 \]
1. Label the array. Then, fill in the blanks below to make true number sentences.

   a. \(6 \times 4 = 24\)
      \[
      \begin{align*}
      (5 \times 4) &= 20 \\
      (1 \times 4) &= 4 \\
      (6 \times 4) &= (5 \times 4) + (1 \times 4) \\
      &= 20 + 4 \\
      &= 24
      \end{align*}
      \]

   b. \(7 \times 4 = 28\)
      \[
      \begin{align*}
      (5 \times 4) &= 20 \\
      (2 \times 4) &= 8 \\
      (7 \times 4) &= (5 \times 4) + (2 \times 4) \\
      &= 20 + 8 \\
      &= 28
      \end{align*}
      \]

   c. \(8 \times 4 = 32\)
      \[
      \begin{align*}
      (5 \times 4) &= 20 \\
      (3 \times 4) &= 12 \\
      (8 \times 4) &= (5 \times 4) + (3 \times 4) \\
      &= 20 + 12 \\
      &= 32
      \end{align*}
      \]

   d. \(9 \times 4 = 36\)
      \[
      \begin{align*}
      (5 \times 4) &= 20 \\
      (4 \times 4) &= 16 \\
      (9 \times 4) &= (5 \times 4) + (4 \times 4) \\
      &= 20 + 16 \\
      &= 36
      \end{align*}
      \]
2. Match the equal expressions.

\[
(5 \times 4) + (3 \times 4) \quad (5 \times 4) + (4 \times 4) \quad (5 \times 4) + (2 \times 4)
\]

3. Nolan draws the array below to find the answer to the multiplication expression \(10 \times 4\). He says, "\(10 \times 4\) is just double \(5 \times 4\)". Explain Nolan’s strategy.

\[
\begin{array}{c}
5 \times 4 = 20 \\
5 \times 4 = 20
\end{array}
\]

\[
20 + 20 = 40
\]

Nolan said double my answer to \(5 \times 4\).
1. Use the array to complete the related equations.

   \[1 \times 4 = \_ \_\_\_\_\_\_\_\_\_\_\_ + 1\]
   \[4 \div 4 = 1\]

   \[2 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 2\]
   \[8 \div 4 = 2\]

   \[3 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 3\]
   \[12 \div 4 = 3\]

   \[4 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 4\]
   \[16 \div 4 = 4\]

   \[5 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 5\]
   \[20 \div 4 = 5\]

   \[6 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 6\]
   \[24 \div 4 = 6\]

   \[7 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 7\]
   \[28 \div 4 = 7\]

   \[8 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 8\]
   \[32 \div 4 = 8\]

   \[9 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 9\]
   \[36 \div 4 = 9\]

   \[10 \times 4 = \_\_\_\_\_\_\_\_\_\_\_\_ + 10\]
   \[40 \div 4 = 10\]
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.

\[ 36 \div 4 = 9 \]
There are 9 boxes of muffins.

4, 8, 12, 16, 20, 24, 28, 32, 36

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

\[ 32 \div 4 = 8 \]
There are 8 glasses in each row.

4 \times 8 = 32
4, 8, 12, 16, 20, 24, 28, 32

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

\[ 28 \div 4 = 7 \]
The cost of 2 notebooks is $14.00.

7 + 7 = 14
1. \(8 \times 10 = 80\)

\[
\begin{array}{c}
\text{8 tens} \\
\text{5 tens} \\
\text{3 tens}
\end{array}
\]

5 tens + 3 tens = 8 tens

\((5 \times 10) + (3 \times 10) = 8 \times 10\)

\[
\begin{array}{c}
50 + 30 = 80
\end{array}
\]

\[
8 \times 10 = 80
\]

2. \(7 \times 4 = 28\)

\[
\begin{array}{c}
\text{7 fours} \\
\text{5 fours} \\
\text{2 fours}
\end{array}
\]

5 fours + 2 fours = 7 fours

\((5 \times 4) + (2 \times 4) = 7 \times 4\)

\[
\begin{array}{c}
20 + 8 = 28
\end{array}
\]

\[
7 \times 4 = 28
\]

3. \(9 \times 10 = 90\)

\[
\begin{array}{c}
9 \times 10 \\
\text{5 \times 10} \\
\text{4 \times 10}
\end{array}
\]

5 tens + 4 tens = 9 tens

\((5 \times 10) + (4 \times 10) = 9 \times 10\)

\[
\begin{array}{c}
50 + 40 = 90
\end{array}
\]

\[
9 \times 10 = 90
\]

4. \(10 \times 10 = 100\)

\[
\begin{array}{c}
10 \times 10 \\
\text{5 \times 10} \\
\text{5 \times 10}
\end{array}
\]

5 tens + 5 tens = 10 tens

\((5 \times 10) + (5 \times 10) = 10 \times 10\)

\[
\begin{array}{c}
50 + 50 = 100
\end{array}
\]

\[
10 \times 10 = 100
\]
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.

\[ 7 \times 10 = ? \]

\[ 7 \times 10 = (5 \times 10) + (2 \times 10) \]
\[ 7 \times 10 = 50 + 20 \]
\[ 7 \times 10 = 70 \]

There are \( \boxed{70} \) children playing in the tournament.

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

\[ 8 \times 3 = ? \]

\[ 8 \times 3 = (4 \times 3) + (4 \times 3) \]
\[ 8 \times 3 = 12 + 12 \]
\[ 8 \times 3 = 24 \]

There are 24 sides altogether.

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?

\[ 12 \times 10 = ? \]

\[ 12 \times 10 = (10 \times 10) + (2 \times 10) \]
\[ 12 \times 10 = 100 + 20 \]
\[ 12 \times 10 = 120 \]

There are 120 bottles in the vending machine.
1. Label the array. Then, fill in the blanks to make true number sentences.

   a. \[ 36 \div 3 = \_12 \_ \]

   \[
   \begin{array}{c}
   \text{\ldots}
   \end{array}
   \]

   \[
   (30 \div 3) = \_10 \_ \\
   (6 \div 3) = \_2 \_ \\
   \]

   \[
   (36 \div 3) = (30 \div 3) + (6 \div 3) \\
   = 10 + 2 \\
   = 12
   \]

   b. \[ 25 \div 5 = \_5 \_ \]

   \[
   \begin{array}{c}
   \text{\ldots}
   \end{array}
   \]

   \[
   (20 \div 5) = \_4 \_ \\
   (5 \div 5) = \_1 \_ \\
   \]

   \[
   (25 \div 5) = (20 \div 5) + (5 \div 5) \\
   = 4 + 1 \\
   = \frac{5}{5}
   \]

   c. \[ 28 \div 4 = \_7 \_ \]

   \[
   \begin{array}{c}
   \text{\ldots}
   \end{array}
   \]

   \[
   (20 \div 4) = \_5 \_ \\
   (8 \div 4) = \_2 \_ \\
   \]

   \[
   (28 \div 4) = (20 \div 4) + (8 \div 4) \\
   = 5 + 2 \\
   = \frac{7}{7}
   \]

   d. \[ 32 \div 4 = \_8 \_ \]

   \[
   \begin{array}{c}
   \text{\ldots}
   \end{array}
   \]

   \[
   (20 \div 4) = \_5 \_ \\
   (12 \div 4) = \_3 \_ \\
   \]

   \[
   (32 \div 4) = (20 \div 4) + (12 \div 4) \\
   = 5 + 3 \\
   = \frac{8}{8}
   \]
2. Match the equal expressions.

24 ÷ 2
36 ÷ 3
39 ÷ 3
26 ÷ 2

(30 ÷ 3) + (6 ÷ 3)
(30 ÷ 3) + (9 ÷ 3)
(20 ÷ 2) + (6 ÷ 2)
(20 ÷ 2) + (4 ÷ 2)

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

Nell breaks apart 24
in 6 twos and 6 twos.
6 twos = 12. So she does
12 ÷ 2 for both parts
and adds the answers
to get 24 ÷ 2 = 12.

   \[ \text{Magazine} \]
   \[ \text{Books} \]
   \[ \text{\$28} \]

   a. What is the total cost of the books?

   \[ 3 \times 8 = 24 \]
   The total cost of the books is 24.

   b. How much does Ted spend altogether?

   \[ 24 + 4 = 28 \]
   Ted spends $28 altogether.

2. Seven children share 28 silly bands equally.

   \[ \text{7 Kids} \]
   \[ 28 \text{ silly bands} \]

   a. How many silly bands does each child get?

   \[ 28 \div 7 = 4 \]
   Each kid gets 4 silly bands.

   b. How many silly bands do 3 children get?

   \[ 3 \times 4 = 12 \]
   3 kids get 12 silly bands.
3. Eighteen cups are equally packed into 6 boxes. Two boxes of cups break. How many cups are unbroken?

\[
\begin{align*}
18 \div 6 &= 3 \\
4 \times 3 &= 12 \\
18 - 6 &= 12 \text{ cups} \\
2 \times 3 &= 6 \text{ broken}
\end{align*}
\]

Another way

12 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?
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.

\[ 6 \times 4 = 24 \]
\[ 24 + 4 = 28 \]

Jason earns \( \$28 \)

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.

\[ 4 \times 7 = 28 \]
\[ 28 - 6 = 22 \]

There are 22 students in Miss Lianto’s class.
3. Orlando buys a box of 18 fruit snacks. Each box comes with an equal amount 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.

\[ 18 \div 3 = 6 \text{ of each flavor} \]

\[ 18 - 6 = 12 \]

There are 12 fruit snacks 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?

\[ 21 \div 3 = 7 \text{ pieces} \]

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

\[ 12 - 7 = 5 \text{ pieces} \]

Eudora needs 5 pieces of ribbon.