The Thousand Bolts factory uses boxes of 1,000 bolts to fill crates of 10,000 bolts. How many boxes of 1,000 bolts are in each crate of 10,000?

Count by thousands to find the total number of boxes of 1,000 bolts that will go into each crate. Then count the boxes.

So, there are _____ boxes of 1,000 bolts in each crate of 10,000.

Example  Suppose the factory has no crates and must use case of 100 to fill an order for 3,200 bolts. How many cases will it pack?

So, there are _____ cases of 100 in 1,000.

So, there are _____ cases of 100 in 3,000.

There are _____ cases of 100 in 200.

Add the cases. 30 + 2 = _____.

So, the factory will pack 32 cases of 100.
1. The Thousand Bolts factory has an order for 3,140 bolts. How can it pack the order using the fewest packages?

2. Suppose the bolt factory has only cases and bags. How can it pack the order for 3,140 bolts?

3. Suppose the bolt factory has only boxes and bags. How can it pack the order for 3,140 bolts?

On Your Own

Complete the packing chart. Use the fewest packages possible. When there is a zero, use the next smaller size package.

<table>
<thead>
<tr>
<th>Number of Bolts Ordered</th>
<th>Crates (Ten Thousands)</th>
<th>Boxes (Thousands)</th>
<th>Cases (Hundreds)</th>
<th>Bags (Tens)</th>
<th>Single Bolts (Ones)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. 5,267</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 2,709</td>
<td></td>
<td></td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6. 5,619</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. 8,416</td>
<td></td>
<td>0</td>
<td></td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>8. 3,967</td>
<td></td>
<td>0</td>
<td></td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Problem Solving

9. The Thousand Bolts factory used 9 boxes, 9 cases, and 10 bags to fill an order. How many bolts did they pack?
The ABC Block Factory receives an order for blocks. The base-ten blocks show the number of blocks ordered.

Each worker on the team checks the order by expressing the number in a different way. What way does each worker use?

**Read and write numbers.**

**Word form** is a way to write a number using words.

Sam gets the order and reads the number to Mary: two thousand, five hundred thirteen

**Expanded form** is a way to write a number by showing the value of each digit.

Mary uses the value of each digit to record the number of blocks that will be in each type of package:

\[2,000 + 500 + 10 + 3\]

**Standard form** is a way to write a number using the digits 0 to 9, with each digit having a place value.

When the order is complete, Kyle writes the total number of blocks on the packing slip: 2,513

So, Sam says the number using ____________ form, Mary uses ____________ form, and Kyle uses ____________ form.

**Math Idea**

The location of a digit in a number tells its value.

**Math Talk**

Explain how to find the value of the underlined digit in 7,521.
1. Write the number shown in expanded form.

<table>
<thead>
<tr>
<th>TEN THOUSANDS</th>
<th>THOUSANDS</th>
<th>HUNDREDS</th>
<th>TENS</th>
<th>ONES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7,598</td>
<td></td>
<td>9</td>
<td>8</td>
</tr>
</tbody>
</table>

____________________ + 500 + 90 + _____________

Write the number in standard form.

2. 4,000 + 600 + 70 + 4 ______________

3. eight thousand, two hundred sixty-one ______________

Write the value of the underlined digit two ways.

4. 6,920

____________________________

5. 8,063

____________________________

On Your Own

Write the number in standard form.

6. 5,000 + 600 + 90 + 7 ______________

7. two thousand, three hundred fifty-nine ______________

8. one thousand, three hundred two ______________

Write the value of the underlined digit two ways.

9. 6,818

____________________________

10. 9,342

____________________________

11. Rename 3,290 as hundreds and tens.

_________ hundreds ________ tens

12. Rename 2,934 as tens and ones.

_________ tens ________ ones

Problem Solving

13. The number of children who attended the fair on opening day is 351 more than the value of 4 thousands. How many children attended the fair on opening day?

____________________________
Unlock the Problem

Wilfren has 40 pennies, Ella has 400 pennies, and Matt has 4,000 pennies. How do their amounts of pennies compare?

Compare the relative sizes of the amounts of pennies.

- Wilfren
- Ella
- Matt

Think: 10 tens is 100.
Think: 10 hundreds is 1,000.
Think: 10 thousands is 10,000.

So, Ella has _____ times as many pennies as Wilfren, and Matt has _____ times as many pennies as Ella.

Try This! Find the number represented by the point.

Start at 0. Skip count by 1,000s until you reach point A.
There are _____ jumps of 1,000. So, point A represents ________.
Share and Show

Find the number that point $B$ represents on the number line.

1. $B$

On Your Own

Find the number represented by the point.

2. $F$

3. $G$

Problem Solving

Use the number line for 4–5.

Nestor and Elliot are playing a number line game.

4. Nestor’s score is shown by point $N$ on the number line. What is his score?

5. Elliot’s score is 8,000. Is Elliot’s score located to the right or to the left of Nestor’s score? Explain.
Compare 3- and 4-Digit Numbers

Essential Question: What are some ways you can compare numbers?

Unlock the Problem

Cody collected 2,365 pennies. Jasmine collected 1,876 pennies. Who collected more pennies?

You can compare numbers in different ways to find which number is greater.

**One Way** Use base-ten blocks.

Compare the values of the blocks in each place-value position from left to right. Keep comparing the blocks until the values are different.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>2,365</th>
<th></th>
<th></th>
<th>1,876</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>7</td>
<td>6</td>
</tr>
</tbody>
</table>

2 thousands is greater than 1 thousand. So, 2,365 \(>\) 1,876.

So, Cody collected more pennies.

**Another Way** Use place value.

Compare digits in the same place-value position from left to right.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>3</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

**STEP 1:** Compare the thousands. The digits are the same.

**STEP 2:** Compare the hundreds. 3 \(>\) 5

So, 7,376 \(>\) 7,513.

Read Math

Read < as *is less than*.
Read > as *is greater than*.
Read = as *is equal to*.

Math Talk

Explain how you know that 568 is less than 4,786.
Share and Show

1. Compare 2,351 and 3,018. Which number has more thousands? Which number is greater?

Compare the numbers. Write <, >, or = in the ___.

2. 835 ___ 853
3. 7,891 ___ 7,891
4. 809 ___ 890
5. 3,834 ___ 3,483

On Your Own

Compare the numbers. Write <, >, or = in the ___.

6. 219 ___ 2,119
7. 2,517 ___ 2,715
8. 5,154 ___ 5,154
9. 5,107 ___ 5,105
10. 1,837 ___ 837
11. 9,832 ___ 9,328

Problem Solving

12. Nina has a dictionary with 1,680 pages. Trey has a dictionary with 1,490 pages. Use <, >, or = to compare the number of pages in the dictionaries.

13. The odometer in Ed’s car shows it has been driven 8,946 miles. The odometer in Beth’s car shows it has been driven 5,042 miles. Which car has been driven more miles?

14. Avery said that she is 3,652 days old. Tamika said that she is 3,377 days old. Who is younger?
Complete the packing chart. Use the fewest packages possible. When there is a zero, use the next smaller size package.

<table>
<thead>
<tr>
<th>Number of Bolts Ordered</th>
<th>Crates (Ten Thousands)</th>
<th>Boxes (Thousands)</th>
<th>Cases (Hundreds)</th>
<th>Bags (Tens)</th>
<th>Single Bolts (Ones)</th>
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<td></td>
<td></td>
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<tr>
<td>2. 2,709</td>
<td></td>
<td></td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Find the number that point A represents on the number line.

3. 

\[0 \quad 500 \quad A \quad 1,000\]

Compare the numbers. Write <, >, or = in the circle.

4. 4,310 \( < \) 4,023
5. 5,136 \( = \) 5,136
6. 732 \( > \) 6,532
7. 9,436 \( > \) 4,963

8. The number of people who attended the Spring Festival is 799 more than 8 thousands. How many people attended the festival?

9. There are 1,290 photos on Nadia’s memory card. There are 1,450 photos on Trevor’s memory card. Use <, >, or = to compare the number of photos on the memory cards.
Fill in the bubble for the correct answer choice.

10. A marble factory ships marbles using bags of 10, cases of 100, cartons of 1,000, and boxes of 10,000. The factory has an order for 3,570 marbles. How can they pack the order if the factory is out of cartons?
   A  350 cases, 7 bags
   B  35 cases, 7 bags
   C  35 cases, 57 bags
   D  3 cases, 75 bags

11. The number of fans who attend the baseball game on opening day is 283 more than 4 thousands. How many fans are attending the baseball game on opening day?
   A  283
   B  4,000
   C  4,283
   D  4,823

Use the number line for 12–13.

12. Kam scored 6,000 points in a game. Which letter on the number line names the point that represents Kam’s score?
   A  F
   B  G
   C  H
   D  I

13. Taissa scored 9,000 points in a game. Which letter on the number line names the point that represents Taissa’s score?
   A  F
   B  G
   C  H
   D  I
Unlock the Problem

It takes Bobby 11 minutes to walk to school each morning. How many minutes will Bobby spend walking to school in 5 days?

Multiply. \( 5 \times 11 = \) __________

One Way
Break apart an array.
Make 5 rows of 11. 
Use the 10s facts and the 1s facts to multiply with 11.
\[
5 \times (10 + 1) \\
5 \times 10 = \_\_\_\_ \quad 5 \times 1 = \_\_\_\_ \\
5 \times 11 = \_\_\_\_ + \_\_\_\_ \\
5 \times 11 = \_\_\_\_\_ \\
\]

Another Way
Find a pattern.
Look at the list.
\[
1 \times 11 = 11 \\
2 \times 11 = 22 \\
3 \times 11 = 33 \\
4 \times 11 = 44 \\
\]
Notice the product has the same factor in the tens and ones places.
To find \( 5 \times 11 \), write the first factor in the tens and ones places.
\[
5 \times 11 = \_\_\_\_ \\
6 \times 11 = \_\_\_\_ \\
7 \times 11 = \_\_\_\_ \\
8 \times 11 = \_\_\_\_ \\
9 \times 11 = \_\_\_\_ \\
\]
5 \( \times \) 11 = 55

Try This!
What if it took Bobby 12 minutes to walk to school?
How many minutes will he spend walking to school in 5 days?

Break apart the factor 12.
\[
5 \times (10 + 2) \\
5 \times 10 = 50 \quad 5 \times 2 = 10 \\
5 \times 12 = \_\_\_\_ + \_\_\_\_ = \_\_\_\_ \\
\]

Double a 6s fact.
Find the 6s product. 
\[5 \times 6 = 30\]
Double that product. \( \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ \)
So, \( 5 \times 12 = \_\_\_\_\_ \). Bobby will spend \( \_\_\_\_\_ \) minutes walking to school.
1. How can you use the 10s facts and the 2s facts to find $4 \times 12$?

2. $9 \times 11 = \underline{99}$

3. $7 \times 12 = \underline{84}$

4. $\underline{44} = 4 \times 11$

Find the product.

5. $\underline{66} = 11 \times 6$

6. $\underline{24} = 12 \times 2$

7. $0 \times 11 = \underline{0}$

8. $\underline{72} = 6 \times 12$

9. $8 \times 12 = \underline{96}$

10. $7 \times 11 = \underline{77}$

11. $12 \times 9 = \underline{108}$

12. $3 \times 12 = \underline{36}$

13. $1 \times 12 = \underline{12}$

14. The graph shows the number of miles some students travel to school each day. How many miles will Carlos travel to school in 5 days?

15. Suppose that Mandy takes 9 trips to school, and Matt takes 11 trips to school. Who travels more miles? Explain.
Unlock the Problem

Tara collects 60 postcards. She arranges them in 12 equal stacks. How many postcards are in each stack?

Divide. $60 \div 12 = $____

One Way Use a multiplication table.

Since division is the inverse of multiplication, you can use a multiplication table to find a quotient.

Think of a related multiplication fact.

$12 \times $____ = 60

• Find the row for the factor 12.
• Look across to find the product, 60.
• Look up to find the unknown factor.
• The unknown factor is 5.

Since $12 \times 5 = 60$, then

$60 \div 12 =$____.

Another Way Use repeated subtraction.

• Start with 60.
• Subtract 12 until you reach 0.
• Count the number of times you subtract 12.

You subtracted 12 five times.

$60 \div 12 =$____

So, there are 5 postcards in each stack.
1. Use the multiplication table on page P271 to find $99 \div 11$.

   Think: What is a related multiplication fact?

Find the unknown factor and quotient.

2. $11 \times \boxed{=} = 66$    $66 \div 11 = \boxed{=}$
   \[ \boxed{=} = \boxed{=} \]
   \[ \boxed{=} = \boxed{=} \]

3. $2 \times \boxed{=} = 24$    $24 \div 2 = \boxed{=}$
   \[ \boxed{=} = \boxed{=} \]
   \[ \boxed{=} = \boxed{=} \]

4. $3 \times \boxed{=} = 33$    $33 \div 3 = \boxed{=}$
   \[ \boxed{=} = \boxed{=} \]
   \[ \boxed{=} = \boxed{=} \]

5. $12 \times \boxed{=} = 72$    $72 \div 12 = \boxed{=}$
   \[ \boxed{=} = \boxed{=} \]
   \[ \boxed{=} = \boxed{=} \]

Find the quotient.

6. $11 \div 11 = \boxed{=}$

7. $77 \div 7 = \boxed{=}$

8. $108 \div 9 = \boxed{=}$

9. $84 \div 12 = \boxed{=}$

10. $96 \div 8 = \boxed{=}$

11. $84 \div 12 = \boxed{=}$

12. $84 \div 7 = \boxed{=}$

Compare. Write $<$, $>$, or $=$ for each circle.

19. $96 \div 8 \ oxed{<} \ 96 \div 12$

20. $77 \div 11 \ oxed{<} \ 84 \div 12$

21. $99 \div 11 \ oxed{<} \ 84 \div 7$

Problem Solving

22. Justin printed 44 posters to advertise the garage sale. He gave 11 friends the same number of posters to display around the neighborhood. How many posters did Justin give each friend?
Unlock the Problem

Megan has a rose garden with the same number of bushes planted in each of 4 rows. There are 48 bushes in the garden. How many bushes are in each row of Megan’s garden?

One Way

Make an array.

48 ÷ 4 = □

Count 48 tiles. Make 4 rows by placing 1 tile in each row.

Continue placing 1 tile in each of the 4 rows until all the tiles are used.

Draw the array you made.

□ □ □ □

There are _____ tiles in each row.

_____ ÷ _____ = _____

So, there are _____ bushes in each row of Megan’s garden.

Another Way

Write related equations.

48 ÷ 4 = □

Think: 4 times what number equals 48?

4 × _____ = 48

You can check your answer using repeated addition.

_____ + _____ + _____ + _____ = _____

Write related equations.

_____ × _____ = 48

48 ÷ _____ = _____

Multiplication and division are inverse operations.

Essential Question How can you write related multiplication and division equations for 2-digit factors?

Math Talk Mathematical Practices

How can you tell if two equations are related?
1. Complete the related equations for this array.

\[3 \times 11 = 33\]
\[33 \div 3 = 11\]

Complete the related multiplication and division equations.

2. \(1 \times 11 = \underline{1}\)\(1\)
   \(\underline{1} \times 1 = 11\)
   \(11 \div 1 = \underline{1}\)
   \(\underline{1} \div 11 = 1\)

3. \(5 \times \underline{12} = 60\)
   \(12 \times 5 = \underline{60}\)
   \(\underline{60} \div 5 = 12\)
   \(12 \div 11 = \underline{11}\)

4. \(\underline{4} \times 11 = 77\)
   \(77 \div \underline{7} = 11\)
   \(77 \div \underline{7} = 11\)

5. \(\underline{7} \times 12 = 84\)
   \(11 \times \underline{7} = 84\)
   \(\underline{84} \div 7 = 12\)
   \(84 \div 7 = \underline{12}\)

6. \(6 \times \underline{11} = 66\)
   \(11 \times \underline{6} = 66\)
   \(66 \div 6 = \underline{11}\)
   \(66 \div 11 = \underline{6}\)

7. \(12 \times 8 = \underline{96}\)
   \(8 \times \underline{12} = 96\)
   \(96 \div \underline{8} = 12\)
   \(96 \div 8 = \underline{12}\)

8. Megan cut 108 roses to make flower arrangements. She made 9 equal arrangements. How many roses were in each arrangement?

9. Megan put 22 roses in a vase. She cut the same number of roses from each of 11 different bushes. How many roses did she cut from each bush?
Unlock the Problem

Mrs. Goldman ordered 4 boxes of yo-yos for her toy store. Each box had 100 yo-yos. How many yo-yos did Mrs. Goldman order?

Use a basic fact and a pattern to multiply.

Factors  Products

\[ 4 \times 1 = 4 \quad \text{Think: Use the basic fact } 4 \times 1 = 4. \]

\[ 4 \times 10 = 40 \]

\[ 4 \times 100 = 400 \]

So, Mrs. Goldman ordered 400 yo-yos.

Try This! Use a basic fact and a pattern to find the products.

A. \[ 1 \times 3 = 3 \]
\[ 10 \times 3 = \_]  

B. \[ 5 \times 1 = 5 \]
\[ 5 \times 10 = 50 \]
\[ 5 \times 100 = \_]  
\[ 5 \times 1,000 = \_]
1. **Explain** how to use a basic fact and a pattern to find $6 \times 100$.

Use a basic fact and a pattern to find the products.

2. $7 \times 10 = \underline{______}$
   
   $7 \times 100 = \underline{______}$
   
   $7 \times 1,000 = \underline{______}$

3. $10 \times 5 = \underline{______}$
   
   $100 \times 5 = \underline{______}$
   
   $1,000 \times 5 = \underline{______}$

4. $3 \times 10 = \underline{______}$
   
   $3 \times 100 = \underline{______}$
   
   $3 \times 1,000 = \underline{______}$

**On Your Own**

Use a basic fact and a pattern to find the products.

5. $2 \times 10 = \underline{______}$
   
   $2 \times 100 = \underline{______}$
   
   $2 \times 1,000 = \underline{______}$

6. $10 \times 8 = \underline{______}$
   
   $100 \times 8 = \underline{______}$
   
   $1,000 \times 8 = \underline{______}$

7. $9 \times 10 = \underline{______}$
   
   $9 \times 100 = \underline{______}$
   
   $9 \times 1,000 = \underline{______}$

**Find the product.**

8. $10 \times 8 = \underline{______}$

9. $6 \times 100 = \underline{______}$

10. $\underline{______} = 4 \times 100$

11. $1,000 \times 4 = \underline{______}$

12. $\underline{______} = 1,000 \times 3$

13. $9 \times 100 = \underline{______}$

**Problem Solving**

**Use the picture graph.**

14. Patty has 20 fewer yo-yos in her collection than Chuck. Draw yo-yos in the picture graph to show the number of yo-yos in Patty’s collection. **Explain** your answer.

---

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of Yo-Yos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>Chuck</td>
<td></td>
</tr>
<tr>
<td>Patty</td>
<td></td>
</tr>
</tbody>
</table>

**Key:** Each $\bigcirc$ = 10 Yo-Yos.
Three groups of 14 students toured the state capitol in Columbus, Ohio. How many students toured the capitol in all?

Multiply. \(3 \times 14 = \) ___

**One Way**

**STEP 1**
Model \(3 \times 14\) with base-ten blocks.

- 3 rows of 10
- 3 rows of 4

**STEP 2**
Multiply the tens and ones.
Record each product.

- \(3 \times 10 = \) ___
- \(3 \times 4 = \) ___

**STEP 3**
Add the products.

\(30 + 12 = 42\)
\(3 \times 14 = 42\)

So, 42 students toured the capitol.

**Another Way**

**STEP 1**
Model \(3 \times 14\) with an area model.

- 3 rows of 10
- 3 rows of 4

**STEP 2**
Multiply the tens. Multiply the ones.

- \(3 \times 10 = \) ___
- \(3 \times 4 = \) ___

**STEP 3**
Add the products.

\(30 + 12 = 42\)
\(3 \times 14 = 42\)

So, 42 students toured the capitol.
1. One way to model 18 is 1 ten 8 ones. How can knowing this help you find $4 \times 18$?

---

**Find the product. Show your multiplication and addition.**

2. $3 \times 16 = \square$

3. $5 \times 13 = \square$

4. $6 \times 14 = \square$

---

**On Your Own**

Find the product. Show your multiplication and addition.

5. $4 \times 13 = \square$

6. $5 \times 15 = \square$

7. $3 \times 17 = \square$

---

**Problem Solving**

8. Randy rakes yards for $5$ an hour. How much money does he earn if he works for 12 hours?
Madison has 13 seeds. She wants to put the same number of seeds in each of 3 pots. How many seeds can Madison put into each pot? How many seeds are left over?

**Activity** 

**Materials** - counters

Use counters to find $13 \div 3$.

**STEP 1** Use 13 counters. Draw 3 circles for the 3 pots.

| ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ |
|---|---|---|
|   |   |   |

**STEP 2** Place one counter in each group until there are not enough to put 1 more in each of the groups.

| ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ |
|---|---|---|
|   |   | ♦ |

There are _____ counters in each circle.

There is _____ counter left over.

$13 \div 3$ is 4 with 1 left over.

The quotient is 4.
The remainder is 1.

So, Madison can put 4 seeds in each pot. There is 1 seed left over.

After dividing a group of objects into equal groups as large as possible, there may be some left over. The amount left over is called the **remainder**.

**Try This!** What if Madison wants to put 4 seeds in each pot. How many pots will Madison need? How many seeds will be left over?

| ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦ |
|---|---|---|
|   |   |   |

• How do you know how many groups to make?

---

**Math Talk**

**Mathematical Practices**

**Explain** why you cannot have a remainder of 3 when you divide by 3.
Share and Show

1. Divide 13 counters into 2 equal groups.

There are _____ counters in each group, and _____ counter left over.

Complete.

2. April divided 17 counters into 4 equal groups.

There were _____ counters in each group and _____ counter left over.

On Your Own

Complete.

4. Divide 14 pencils into 3 equal groups.

There are _____ pencils in each group and _____ pencils left over.

5. Divide 60 pieces of chalk into groups of 8.

There are _____ groups and _____ pieces of chalk left over.

Find the total number of objects.

6. There are 2 shoes in each of 6 groups and 1 shoe left over.

There are _____ shoes in all.

7. There are 4 apples in each of 3 groups and 2 apples left over.

There are _____ apples in all.

Problem Solving

Use the bar graph for 8.

8. If Hector divides the oak leaves evenly into 4 display boxes, how many leaves will be in each box? How many leaves will be left over?
Unlock the Problem

Emma baked 52 muffins. She wants to put an equal number of muffins on each of 4 trays. How many muffins can she put on each tray?

Find $52 \div 4$.

**STEP 1**
Use base-ten blocks to model the problem. Draw 4 rectangles to represent the 4 equal groups.

**STEP 2**
Share the tens. Place 1 ten in each group until there are not enough tens to put 1 more ten in each group.

**STEP 3**
Regroup the remaining ten as ones. There are now 12 ones.

**STEP 4**
Share the ones. Place 1 one in each group until there are not enough ones to put 1 more one in each group.

So, Emma can put ______ muffins on each tray.
1. Find $42 \div 2$.
   - How many equal groups are there? _____
   - How many tens go in each group? _____
   - How many ones go in each group? _____
   - The quotient is _____.

Use base-ten blocks and your MathBoard to divide.

2. $65 \div 5 = _____$
3. $90 \div 3 = _____$
4. $88 \div 4 = _____$

On Your Own

Use base-ten blocks and your MathBoard to divide.

5. $72 \div 2 = _____$
6. $69 \div 3 = _____$
7. $96 \div 6 = _____$

Problem Solving

8. Roger has 84 trading cards. He wants to put an equal number in each of 3 boxes. How many cards will he put into each box?

9. Riley has 78 postcards. She wants to put 6 on each poster board. How many poster boards will she need?
Find the product.

1. _____ = 11 × 5  

2. 12 × 7 = _____

Find the unknown factor and quotient.

3. 4 × □ = 44  
   44 ÷ 4 = □
   □ = _____  
   □ = _____

4. Write the related multiplication and division equations for the numbers 5, 12, 60.

Use a basic fact and a pattern to find the products.

5. 3 × 10 = ____________  
   3 × 4 = ____________
   3 × 100 = ____________  
   100 × 7 = ____________
   3 × 1,000 = ____________  
   1,000 × 7 = ____________

Find the product. Show your multiplication and division.

7. 
   ____________  
   3 × 10 = _____  
   3 × 4 = _____
   ____________  
   _____ + _____ = _____
   3 × 10 = _____  
   3 × 4 = _____

Use base-ten blocks and your MathBoard to divide.

8. 132 ÷ 6 = _____  

9. 160 ÷ 8 = _____

10. Jerry printed 48 photos. He gave 4 friends the same number of photos. How many photos did each friend receive?

11. Tina divides 17 crayons into 3 equal groups. How many crayons will be in each group? How many crayons will be left over?
Fill in the bubble for the correct answer choice.

12. Marita cuts 72 daisies to make bouquets. She makes 6 equal bouquets. How many daisies are in each bouquet?
   
   A  6  
   B  7  
   C  8  
   D  12

13. Christine charges $5 an hour to babysit. How much money does she earn in 16 hours?
   
   A  $21  
   B  $50  
   C  $64  
   D  $80

14. Use the bar graph. Hector divides the carrot seeds evenly in 4 garden plots. How many carrot seeds will be left over?

   ![Bar Graph]

   A  5  
   B  4  
   C  3  
   D  2

15. Roberto has 39 model cars. He wants to display an equal number of model cars on each of 3 shelves. How many model cars will he put on each shelf?
   
   A  2  
   B  9  
   C  13  
   D  39
Unlock the Problem

You can use models to represent fractions in tenths and hundredths.

Example

A

STEP 1
This model has 10 equal parts. Each part is one tenth. Shade three parts out of ten equal parts.

STEP 2
Write the fraction. Think: Three tenths are shaded.

B

STEP 1
This model has 100 equal parts. Each part is one hundredth. Shade eight of one hundred equal parts.

STEP 2
Write the fraction. Think: Eight hundredths are shaded.

Try This!
Shade the model to show nine of the ten equal parts.

Read: __________________________
Write: ______

Shade the model to show sixty-five of the hundred equal parts.

Read: __________________________
Write: ______

Math Talk
Which number in a fraction represents the number of parts being counted, and which represents the number of equal parts in the whole?
**Write the fraction that names the shaded part.**

1.  
   ![Shaded Fraction](image1)
   Think: How many equal parts are shaded?

2.  
   ![Shaded Fraction](image2)

3.  
   ![Shaded Fraction](image3)

**Shade to model the fraction. Then write the fraction in numbers.**

4. three tenths
   ![Shaded Fraction](image4)

5. twenty-three hundredths
   ![Shaded Fraction](image5)

**On Your Own**

**Write the fraction that names the shaded part.**

6.  
   ![Shaded Fraction](image6)

7.  
   ![Shaded Fraction](image7)

8.  
   ![Shaded Fraction](image8)

9.  
   ![Shaded Fraction](image9)

**Problem Solving**

10. Each player shot a basketball 10 times. Eric made 4 baskets. Write a fraction to represent the part of Eric’s shots that were baskets.

11. Nina asked 100 students if they have a pet. Of the students, $\frac{19}{100}$ have a cat. How many students have a cat?
Unlock the Problem

Troy uses \( \frac{1}{4} \) of a box of clay to make one model of a car. How many boxes of clay does he use to make 5 model cars?

Make a model.

- Draw squares divided into fourths to show the boxes of clay. Shade \( \frac{1}{4} \) for the amount of clay Troy uses for each of the 5 model cars.
- Count the number of shaded parts. There are ____ shaded parts.
- Write the fraction.

\[
\frac{\square}{\square} \quad \frac{\square}{\square} \quad \frac{\square}{\square} \quad \frac{\square}{\square}
\]

The number \( \frac{5}{4} \) is a fraction greater than 1. A fraction greater than 1 can be written as a mixed number. A mixed number has a whole number and a fraction.

So, Troy uses \( \frac{5}{4} \) or \( 1 \frac{1}{4} \) boxes of clay to make 5 model cars.

Math Talk

Why are \( \frac{5}{4} \) and \( 1 \frac{1}{4} \) equal?
**Share and Show**

1. Each fraction circle is 1 whole. Write a mixed number for the parts that are shaded.

   There are _____ parts shaded.
   
   There are _____ equal parts in the whole.
   
   Fraction: [ ] shaded parts
   [ ] parts in a whole

   There is _____ whole shaded and _____ thirds shaded.

   The mixed number is _____ .

**On Your Own**

Each shape is 1 whole. Write a mixed number for the parts that are shaded.

2. [Shaded parts]

3. [Shaded parts]

4. [Shaded parts]

5. [Shaded parts]

**Problem Solving**

6. Luis played \( \frac{6}{4} \) games of soccer this season. How can you write the number of games Luis played as a mixed number?

   ____________________________

7. Marci used \( \frac{7}{3} \) packages of juice drinks. How can you write the number of packages of juice drinks Marci used as a mixed number?

   ____________________________
Bart brought an apple pie to the picnic. He cut the pie into 6 equal pieces and 3 pieces were eaten.

- What fraction names the amount of the pie that was eaten? \( \frac{3}{6} \)
- What fraction names the amount of the pie that was left over? \( \frac{3}{6} \)

Bart divided each of the leftover pieces into 2 equal pieces. Draw a dashed line on each piece to show how Bart divided it.

After you divide each sixth-size piece into 2 equal pieces, there will be 12 pieces in the whole pie. The pieces are called twelfths.

- What fraction names the total number of pieces Bart has left? \( \frac{6}{12} \) \( \frac{3}{6} \) and \( \frac{3}{12} \) are equivalent since they both name the same amount of the pie.
Use models to find the equivalent fraction.

1. \( \frac{1}{2} = \frac{\square}{4} \)
   This model shows a whole divided into 2 equal parts.
   Shade the model to show the fraction \( \frac{1}{2} \).

2. \( 1 = \frac{\square}{6} \)
   This model shows a whole divided into 4 equal parts.
   Shade the model to show a fraction equivalent to \( \frac{1}{2} \).

So, \( \frac{1}{2} = \frac{2}{4} \).

On Your Own

Use models to find the equivalent fraction.

2. \( \frac{1}{2} = \frac{\square}{6} \)

3. \( \frac{9}{12} = \frac{\square}{4} \)

Problem Solving

4. A loaf of bread has 12 slices. Micky ate \( \frac{1}{4} \) of the loaf. Write the fraction of the loaf Micky ate in twelfths.

5. Sandra used \( \frac{1}{4} \) of a meter of string to make a bracelet. Write the fraction of a meter of string Sandra used in eighths.
Unlock the Problem

You can use a multiplication table for other equivalent fractions for $\frac{1}{2}$.

**Activity** What are some equivalent fractions for $\frac{1}{2}$?

**Materials** ■ multiplication table

- Shade the row for the numerator of the fraction $\frac{1}{2}$.
The numerator is 1.

- Shade the row for the denominator of the fraction $\frac{1}{2}$.
The denominator is 2.

- Look across the rows for numerator 1 and denominator 2.

Write the products with the numerator 1 as a factor. Then write the products with the denominator 2 as a factor. The first three are done for you.

\[
\begin{align*}
\text{numerator} & \quad \frac{1}{2} = \frac{2}{4} = \frac{3}{6} \\
\text{denominator} & \quad \frac{1}{2} = \frac{2}{4} = \frac{3}{6}
\end{align*}
\]

- What do you notice about the products from the column for 1 to the column for 2?
The numerator and denominator both increase by a factor of ______.

- What do you notice about the products from the column for 1 to the column for 3?
The numerator and denominator both increase by a factor of ______.

- What do you notice about the products from the column for 1 to the column for 4?
The numerator and denominator both increase by a factor of ______.

So, $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, and $\frac{6}{12}$ are some equivalent fractions for $\frac{1}{2}$.
Use a multiplication table to find equivalent fractions.

1. Write 3 equivalent fractions for $\frac{1}{3}$.
   - Shade the row for the numerator of the fraction $\frac{1}{3}$. The numerator is _____.
   - Shade the row for the denominator of the fraction $\frac{1}{3}$. The denominator is _____.
   - Look across the rows for numerator 1 and denominator 3.
     Write the products with the numerator 1 as a factor. Then write the products with the denominator 3 as a factor.

   numerator \[\rightarrow\] 1 \[\rightarrow\] $\frac{1}{3}$ = \[\] = \[\]

   denominator \[\rightarrow\] 3 = \[\] = \[\]

   So, $\frac{1}{3}$ = \[\] = \[\] = \[\]

   List 3 equivalent fractions.

   2. $\frac{1}{6}$

   3. $\frac{1}{4}$

On Your Own

Use a multiplication table to find three equivalent fractions.

4. $\frac{2}{5}$

5. $\frac{3}{10}$

Problem Solving

6. On Jan’s soccer team, $\frac{1}{5}$ of the players are on the field. What are three equivalent fractions that name the part of the team on the field?

7. Chen used $\frac{3}{4}$ of a carton of milk. What are three equivalent fractions that name the part of the carton of milk that Chen used?
Name ____________________________

**Concepts and Skills**

Write the fraction that names the shaded part.

1. [Diagram]

2. [Diagram]

Each shape is 1 whole. Write a mixed number for the parts that are shaded.

3. [Diagram]

4. [Diagram]

Use models to find the equivalent fraction.

4. \( \frac{1}{4} = \frac{\square}{12} \)

5. \( \frac{5}{6} = \frac{\square}{12} \)

Use a multiplication table to find three equivalent fractions.

6. \( \frac{3}{4} \)

7. \( \frac{4}{10} \)

**Problem Solving**

8. Three friends shared 4 pies equally. Each person got \( \frac{4}{3} \) pies. How can you write how much pie each person got as a mixed number?

9. Bill bought a large submarine sandwich and cut it into 8 equal pieces. He ate \( \frac{1}{4} \) of the sandwich. How can you write how much of the sandwich Bill ate as eighths?
Fill in the bubble for the correct answer choice.

10. Each player hit a baseball 10 times. Linda batted 8 balls to the outfield. Write a fraction to show what part of 10 hits Linda batted to the outfield.

A \( \frac{18}{18} \)
B \( \frac{10}{8} \)
C \( \frac{9}{10} \)
D \( \frac{8}{10} \)

11. Vilma used \( \frac{8}{3} \) packages of graham crackers to make piecrusts. How can you write the packages of crackers Vilma used as a mixed number?

A \( 2\frac{1}{8} \)
B \( 2\frac{1}{3} \)
C \( 2\frac{2}{3} \)
D \( 3\frac{1}{3} \)

12. Sam used \( \frac{10}{12} \) of a meter of ribbon to decorate a picture frame. What fraction of a meter of ribbon, in sixths, did Sam use?

A \( \frac{2}{12} \)
B \( \frac{5}{6} \)
C \( \frac{6}{12} \)
D \( \frac{12}{10} \)

13. Leona used \( \frac{3}{8} \) of a bottle of juice. Which is an equivalent fraction that names the part of the bottle of juice that Leona used?

A \( \frac{6}{16} \)
B \( \frac{5}{8} \)
C \( \frac{3}{4} \)
D \( \frac{8}{3} \)
**Same Size, Same Shape**

**Essential Question** How can you identify shapes that have the same size and are shaped the same?

You can tell if two shapes have the same size and are shaped the same by comparing the matching parts of the shapes.

**Activity** Compare size and shape.

**Materials** ■ grid paper ■ scissors ■ ruler

**STEP 1** Trace Shape A on grid paper. Cut out Shape A.

**STEP 2** Move Shape A in any way to compare it to Shape B.
- Do the shapes match exactly? __________
Shape A and Shape B __________ the same size and __________ shaped the same.

**STEP 3** Move Shape A in any way to compare it to Shape C.
- Do the shapes match exactly? __________
Shape A and Shape C __________ shaped the same.

**Try This!**

Since all the angles in Shapes A and B are the same, you can compare shapes by their matching sides.

The length of the shorter side of Shape A is _______ units.
The length of the shorter side of Shape B is _______ units.
The length of the longer side of Shape A is _______ units.
The length of the longer side of Shape B is _______ units.

So, Shape A and Shape B have the _______ size and are shaped the _______.

**Math Talk** Mathematical Practices

Explain how the size and shape of Shape A compares to the size and shape of Shape C.
1. Which shape appears to have the same size and the same shape as Shape A?  

Think: If I trace Shape A and move it, which shape might it match exactly?

On Your Own

Look at the first shape. Tell if it appears to have the same size and shape as the second shape. Write yes or no.

2.  

3.  

4.  

5.  

Problem Solving

6. Kyra says that these shapes have the same size and same shape. Is she correct? Explain.
Unlock the Problem

You can use different units to name the same length.

Erin has a shelf that is 2 feet long. How many inches long is Erin’s shelf?

**One Way** Draw a picture.

2 feet

<table>
<thead>
<tr>
<th>1 foot</th>
<th>1 foot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Draw one box to show each foot. Below each foot, draw 12 small boxes to show the number of inches in 1 foot. Count the total number of small boxes.

There are 24 small boxes in all. 2 feet = _____ inches.

So, Erin’s shelf is _____ inches long.

**Another Way** Use a number line.

Erin has a table that is 3 feet long. How many inches long is her table? Draw a number line and label it in feet.

Draw a 12-inch jump for each foot. Add the lengths of the jumps to find the total number of inches.

3 feet = _____ inches.

So, Erin’s table is _____ inches long.
1. Use the number line. Rename 4 feet using inches.

4 feet = _____ inches

2. Rename 7 feet using inches.

7 feet = _____ inches

3. Rename 6 feet using inches.

6 feet = _____ inches

4. Use the number line. Rename 8 feet using inches.

8 feet = _____ inches

5. Ella has a rope that is 10 feet long. How many inches long is the rope?

6. Jose is 5 feet tall. How many inches tall is he?
**Unlock the Problem**

**Real World**

Gina needs a piece of wood that is 4 meters long to make a bench. How many centimeters of wood does Gina need?

**Complete the table to show how the units are related.**

**STEP 1** Look for a pattern to complete the table. Describe the relationship.

<table>
<thead>
<tr>
<th>Meters</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centimeters</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

To find the number of centimeters, add ______ centimeters for each meter.

**STEP 2** Use the relationship to find the number of centimeters in 4 meters.

4 meters = ______ centimeters

So, Gina needs ______ centimeters of wood to make a bench.

---

**Example**

**A. Change 6 meters to centimeters.**

Add 100 to ______ centimeters.

So, 6 meters = ______ centimeters.

**B. Change 8 meters to centimeters.**

Multiply 100 centimeters by ______.

So, 8 meters = ______ centimeters.
1. How can you change 3 meters to centimeters? Complete the table to show how the units are related.

<table>
<thead>
<tr>
<th>Meters</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centimeters</td>
<td>100</td>
<td>200</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

To find the number of centimeters, add ____ centimeters for each meter.

So, 3 meters = ____ centimeters.

Find the unknown number.

2. 2 meters = _____ centimeters
3. 5 meters = _____ centimeters

On Your Own

Complete the table.

4.

<table>
<thead>
<tr>
<th>Meters</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centimeters</td>
<td>300</td>
<td>400</td>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td>900</td>
<td></td>
</tr>
</tbody>
</table>

Find the unknown number.

5. 8 meters = _____ centimeters
6. 3 meters = _____ centimeters

Problem Solving

7. Jorge needs 7 meters of wire for a garden fence. The wire is sold in centimeters. How many centimeters of wire does Jorge need?

8. Wanda needs 9 meters of fabric to make curtains. She has 1,000 centimeters of fabric. Does Wanda have enough fabric to make the curtains? Explain.

________________________________

__________________________________
Estimate and Measure Liquid Volume

Essential Question How are cups, pints, quarts, and gallons related?

You can use customary units to measure the amount of liquid a container will hold. Some customary units are cup (c), pint (pt), quart (qt), and gallon (gal).

Activity Show how cups, pints, quarts, and gallons are related.

Materials ■ cup, pint, quart, gallon containers ■ water

STEP 1 Estimate the number of cups it will take to fill the pint container. Record your estimate in the table.

STEP 2 Fill a cup and pour it into the pint container. Repeat until the pint container is full. Record the number of cups it took to fill the pint container.

STEP 3 Repeat Steps 1 and 2 for the quart and gallon containers.

<table>
<thead>
<tr>
<th>Number of Cups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cups in a Pint</td>
</tr>
<tr>
<td>Estimate</td>
</tr>
<tr>
<td>Liquid Volume</td>
</tr>
</tbody>
</table>

Math Talk

Mathematical Practices

Which unit would you use to measure the amount of water needed to fill an aquarium? Explain your choice.
Choose the unit you would use to measure the amount of liquid the container will hold. Write *cup, pint, quart,* or *gallon.*

1. Think: A cup is small.
   
   cup

2. bucket

3. bathtub

4. glass

---

**On Your Own**

Choose the unit you would use to measure the amount of liquid the container will hold. Choose the better unit of measure.

5. a dog’s water bowl: 2 cups or 2 gallons

6. a juice box: 1 cup or 1 quart

---

**Problem Solving**

7. Lila made 3 quarts of lemonade. How many cups of lemonade did she make?

8. Richard made 2 gallons of fruit punch for a party. How many 1-cup servings can he make?
Unlock the Problem

Weight is the measure of how heavy an object is. Customary units of weight include ounce (oz) and pound (lb).

1 slice of bread weighs about 1 ounce. 1 loaf of bread weighs about 1 pound.

Activity  Show how ounces and pounds are related.

Materials  ■ spring scale ■ classroom objects

STEP 1  Estimate the weight of the object shown in the table. Record your estimate.

STEP 2  Use a scale to measure the weight of the object to the nearest ounce or pound. Record the weight.

STEP 3  Repeat Steps 1 and 2 for each object.

<table>
<thead>
<tr>
<th>Weight of Objects</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Object</td>
<td>Estimate</td>
<td>Weight</td>
</tr>
<tr>
<td>apple</td>
<td></td>
<td></td>
</tr>
<tr>
<td>book</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pencil box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tape dispenser</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Which unit would you use to measure the weight of a grape? Write ounce or pound.
   
   ounce

Think: A grape is a small, light object.

Choose the unit you would use to measure the weight. Write ounce or pound.

2. 

3. 

4. 

On Your Own

Choose the unit you would use to measure the weight. Write ounce or pound.

5. 

6. 

7. 

Problem Solving

8. Duane bought some oregano to use in a batch of pasta sauce. Which is a more likely weight for the oregano, 1 ounce or 1 pound?

9. Erin bought a bag of flour to use for baking dinner rolls. Did she buy 5 ounces of flour or 5 pounds of flour?
Look at the first shape. Tell if it appears to have the same size and shape as the second shape. Write yes or no.

1.  

2.  

3. Use the number line. Rename 5 feet using inches.

5 feet = _____ inches

Find the unknown number.

4. 6 meters = _____ centimeters
5. 8 meters = _____ centimeters

Choose the unit you would use to measure the amount of liquid the container will hold. Choose the better unit of measure.

6. a pitcher of iced tea: 1 cup or 1 gallon

7. A tea pot holds 4 quarts of tea. How many 1-cup servings of tea does it hold?

8. Evan bought a large bag of dry dog food for his dog. Did Evan buy 6 ounces or 6 pounds of dog food?
9. Which shapes appear to have the same size and shape?

- A and B
- B and C
- B and D
- A and C

10. Trey’s desk is 3 feet wide. How many inches wide is the desk?

- 3 inches
- 24 inches
- 36 inches
- 48 inches

11. Juana needs 2 meters of yarn for a friendship bracelet. How many centimeters of yarn does she need?

- 2,000 centimeters
- 200 centimeters
- 20 centimeters
- 2 centimeters

12. Lana made 3 quarts of soup. How many pints of soup did she make?

- 6 pints
- 12 pints
- 18 pints
- 24 pints

13. Which object weighs about 1 ounce?

- a loaf of bread
- a watermelon
- a strawberry
- a chair