AchieveMath

Student Book

Volume 2

Name:

Catapult Learning™

Unit 4:

Fraction Multiplication

Catapult Learning™

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Deck Party

Families are gathering at the Millers' for a party. Read each problem and answer the questions. Draw a **tape diagram** to find each product.

1. Anne Miller spends $\frac{3}{4}$ of $24 on decorations for the party. Her sister Aisha spends $\frac{4}{3}$ of $24 on decorations.

   a. Predict which person spends more money and explain why.

   _____

   _____

   b. Write multiplication equations to show the amount each person spends.

   Anne: _____   Aisha: _____

   c. Was your prediction accurate? _____

2. Mr. Miller makes 15 gallons of iced tea for the party. He also makes lemonade and fruit punch. The amount of fruit punch is $\frac{6}{5}$ of the amount of iced tea, and the amount of lemonade is $\frac{2}{3}$ of the amount of iced tea.

   a. Predict which drink Mr. Miller makes the most of and explain why.

   _____

   _____

   b. Write multiplication equations to show the amounts of fruit punch and lemonade.

   Fruit punch: _____   Lemonade: _____

   c. Was your prediction accurate? _____

Made in the Shade

Review the example problem. Then, read the problems and answer the questions. Draw **tape diagrams** to solve.

Example

Mr. Jefferson builds a bench for the deck. The length of each screw he uses is $\frac{4}{5}$ the width of the deck boards, which are **5** centimeters wide. Will the screws be longer than **5** centimeters? How long will they be?
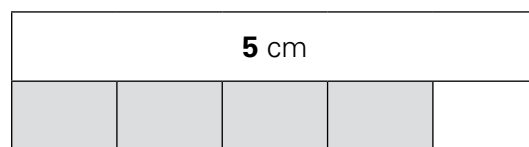
Step 1

Make a prediction and explain why.

The screws will not be longer than the width of the deck boards, because $\frac{4}{5}$ is less than 1.

Step 2

Use tape diagrams to model $\frac{4}{5}$ of 5. Since the denominator is **5**, divide the bottom tape into **5** parts. Since the numerator is **4**, shade **4** parts.
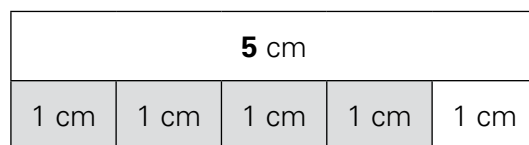
5 cm				

Step 3

Use division to determine the value of each part of the tape diagram. Then find the value of the shaded parts to find the length of the screws.

Since 5 ÷ 5 = 1, each part is 1 cm.

The screws are **4** cm long.

5 cm				
1 cm	1 cm	1 cm	1 cm	1 cm

Step 4

Was your prediction correct?

Yes, because the tape diagram shows that the length of the screws is less than the width of the deck boards.

---

1. A roll of fabric has 48 yards. The Garcias use $\frac{11}{8}$ of a roll.

Will the Garcias use more or less than 48 yards? _____

The Garcias use _____ yards of fabric.

2. The Lees have a 72-inch long rug. They buy a table that is $\frac{6}{8}$ as long.

Will the table's length be more or less than the rug's length? _____

The table is _____ inches long.

Lesson 23 Exit Ticket

Part 1: Predict which distance is greater and why. Then draw tape diagrams to find each distance.

1. Violet's family goes on a car trip. The first day, they drive 240 miles. The second day, they drive $\frac{3}{5}$ of 240 miles. On the third day, Violet's family drives $\frac{3}{2}$ of 240 miles.

   a. Predict on which day Violet's family drives the greatest distance and explain why.

   _____

   _____

   b. Draw tape diagrams to prove your prediction is accurate.

   They travel _____ miles on the second day.

   They travel _____ miles on the third day.

   c. Was your prediction accurate? _____

Part 2: Answer the questions.

2. Violet and Tony ride their bikes. Violet's bike is 52 inches tall. Tony's bike is $\frac{5}{6}$ the height of Violet's bike. Is the height of Tony's bike greater than, less than, or equal to 52 inches? How do you know? _____

   _____

   _____

Extra Practice: Greater or Less?

Part 1: For each pair of expressions, circle the one you predict has the greater product. Draw **tape diagrams** to multiply and prove your prediction is correct.

$18 \times \frac{4}{6}$ or $18 \times \frac{7}{4}$	$29 \times \frac{4}{4}$ or $29 \times \frac{5}{7}$
$35 \times \frac{8}{6}$ or $35 \times \frac{3}{5}$	$8 \times \frac{3}{2}$ or $8 \times \frac{10}{12}$
$21 \times \frac{5}{6}$ or $21 \times \frac{3}{3}$	$12 \times \frac{3}{10}$ or $12 \times \frac{4}{3}$

Part 2: For each pair of expressions, circle the one you predict has the lesser product. Draw **tape diagrams** to multiply and prove your prediction is correct.

$36 \times \frac{8}{3}$ or $36 \times \frac{8}{9}$	$13 \times \frac{5}{8}$ or $13 \times \frac{4}{3}$
$78 \times \frac{7}{6}$ or $78 \times \frac{5}{6}$	$28 \times \frac{10}{8}$ or $28 \times \frac{9}{12}$
$19 \times \frac{4}{9}$ or $19 \times \frac{4}{2}$	$5 \times \frac{4}{6}$ or $5 \times \frac{8}{3}$

Part 3: For each problem, circle the fraction that would fill in the blank to make the greatest product.

1. $26 \times$ _____ $\frac{5}{5}$ $\frac{3}{2}$ $\frac{8}{10}$ **2.** $65 \times$ _____ $\frac{7}{8}$ $\frac{2}{1}$ $\frac{6}{6}$

Part 4: For each problem, circle the fraction that would fill in the blank to make the least product.

3. $38 \times$ _____ $\frac{4}{3}$ $\frac{2}{2}$ $\frac{7}{9}$ **4.** $15 \times$ _____ $\frac{3}{5}$ $\frac{4}{4}$ $\frac{8}{3}$

Planting for the Future

Of all the trees that Connor and Mila planted, $\frac{1}{2}$ are fruit trees and $\frac{1}{2}$ are not fruit trees. Read each problem. Model the solution with **fraction tiles** and answer the questions.

1. Of the fruit trees, $\frac{2}{5}$ are plum trees.

    a. What multiplication expression represents the plum trees? _____

    b. Will the product be greater than, less than, or equal to $\frac{1}{2}$? _____

    c. How do you know? _____

    d. What fraction of all the trees are plum trees? _____

2. Of the fruit trees, $\frac{3}{5}$ are apple trees.

    a. What multiplication expression represents the apple trees? _____

    b. Will the product be greater than, less than, or equal to $\frac{1}{2}$? _____

    c. How do you know? _____

    d. What fraction of all the trees are apple trees? _____

3. Of the trees that are not fruit trees, $\frac{3}{4}$ are evergreens.

    a. What multiplication expression represents the evergreens? _____

    b. Will the product be greater than, less than, or equal to $\frac{1}{2}$? _____

    c. How do you know? _____

    d. What fraction of all the trees are evergreens? _____

New Trees

Part 1: Read each problem. Model the solution with **fraction tiles** and answer the questions.

1. Mr. Tranh is the leader of the volunteers who are planting trees. Mr. Tranh brings in a water truck with $\frac{3}{4}$ of a tank of water. He uses $\frac{1}{3}$ of the water in the tank to water trees planted on the south side of the school building.

   a. What multiplication expression represents the water Mr. Tranh uses on the south side? _____

   b. Will the product be greater than, less than, or equal to $\frac{3}{4}$? _____

   c. How do you know? _____

   d. What fraction of a full tank of water does Mr. Tranh use on the south side? _____

Part 2: For each problem, use **fraction tiles** to find the product and complete the equation.

2. $\frac{1}{2} \times \frac{1}{6} =$ _____

3. $\frac{1}{2} \times \frac{1}{2} =$ _____

4. $\frac{2}{5} \times \frac{1}{4} =$ _____

5. $\frac{2}{3} \times \frac{1}{8} =$ _____

6. $\frac{2}{3} \times \frac{1}{4} =$ _____

7. $\frac{1}{3} \times \frac{3}{4} =$ _____

8. $\frac{1}{4} \times \frac{1}{2} =$ _____

9. $\frac{3}{4} \times \frac{1}{6} =$ _____

Lesson 24 Exit Ticket

Part 1: Read each problem. Model the solution with **fraction tiles** and answer the questions.

1. Nico has $\frac{2}{3}$ of a bag of sugar. He uses $\frac{1}{8}$ of the sugar in the bag to make some pies. He wants to know how much of a whole bag of sugar that is.

    a. What multiplication expression represents the sugar Nico uses? _____

    b. Will the product be greater than, less than, or equal to $\frac{2}{3}$? _____

    c. How do you know? _____

    d. What fraction of a full bag of sugar does Nico use? _____

2. The distance from Moira's house to her friend Melissa's house is $\frac{1}{2}$ mile. When Moira has walked $\frac{1}{3}$ of the way to Melissa's house, what fraction of a mile has she walked?

    a. What multiplication expression represents the distance Moira has walked?

    _____

    b. Will the product be greater than, less than, or equal to $\frac{1}{2}$? _____

    c. How do you know? _____

    d. What fraction of a mile has Moira walked? _____

Part 2: For each problem, use **fraction tiles** to find the product and complete the equation.

3. $\frac{1}{2} \times \frac{5}{6} =$ _____
                         4. $\frac{4}{6} \times \frac{1}{2} =$ _____

Extra Practice: Think Fractions

Part 1: Without multiplying, write each expression in the most appropriate box.

$$\frac{3}{5} \times \frac{1}{10} \qquad \frac{4}{5} \times \frac{1}{3} \qquad \frac{2}{5} \times \frac{5}{6} \qquad \frac{4}{5} \times \frac{4}{9} \qquad \frac{3}{5} \times \frac{2}{3} \qquad \frac{2}{5} \times \frac{3}{7}$$

Product less than $\frac{4}{5}$

_____ _____

Product less than $\frac{3}{5}$

_____ _____

Product less than $\frac{2}{5}$

_____ _____

Part 2: Draw a line to match each expression to the equivalent product.

$\frac{1}{2} \times \frac{1}{3}$ $\qquad\qquad\qquad$ $\frac{1}{2}$

$\frac{3}{4} \times \frac{2}{3}$ $\qquad\qquad\qquad$ $\frac{5}{12}$

$\frac{1}{3} \times \frac{3}{4}$ $\qquad\qquad\qquad$ $\frac{1}{6}$

$\frac{5}{6} \times \frac{1}{2}$ $\qquad\qquad\qquad$ $\frac{1}{8}$

$\frac{1}{3} \times \frac{3}{8}$ $\qquad\qquad\qquad$ $\frac{1}{4}$

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Rockhounding Adventure

Read the problems and solve using tape diagrams.

1. Jason finds that $\frac{8}{10}$ of the rocks he collects are thunder eggs. $\frac{3}{4}$ of them contain jasper. What fraction of Jason's rocks are jasper thunder eggs?

   a. Will the fraction of jasper thunder eggs be greater or less than $\frac{8}{10}$? _____

   b. Use tape diagram to find out how many rocks are jasper thunder eggs.

   $\frac{8}{10} \times \frac{3}{4} =$ _____   _____ of the rocks are jasper thunder eggs.

2. Nellie discovers that $\frac{5}{8}$ of the rocks she finds are thunder eggs. $\frac{4}{5}$ of them contain opal. What fraction of Nellie's rocks are opal thunder eggs?

   a. Will the fraction of opal thunder eggs be greater or less than $\frac{5}{8}$? _____

   b. Use the tape diagram to find out how many rocks are opal thunder eggs.

   $\frac{5}{8} \times \frac{4}{5} =$ _____   _____ of the rocks are opal thunder eggs.

Finding Rocks

Review the example problem. Make a prediction about the product. Circle your response. Then use a **tape diagram** to solve.

Example

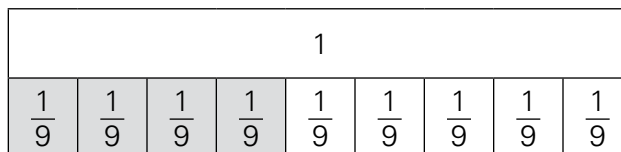$$\frac{4}{9} \times \frac{1}{2} = ?$$

Step 1

Make a prediction. Will the product be greater than, less than, or equal to $\frac{4}{9}$?

The product will be less than $\frac{4}{9}$ because $\frac{1}{2}$ is less than 1.

Step 2

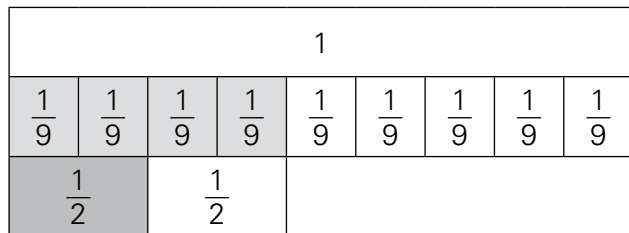Model $\frac{4}{9}$ with a tape diagram.

1								
$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$

Step 3

Use the tape diagram to find $\frac{1}{2}$ of $\frac{4}{9}$.

$\frac{1}{2}$ of $\frac{4}{9}$ is equal to two $\frac{1}{9}$ parts.

$$\frac{4}{9} \times \frac{1}{2} = \frac{2}{9}$$

1								
$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$	$\frac{1}{9}$
$\frac{1}{2}$		$\frac{1}{2}$						

Step 4

Prove your prediction is accurate.

My prediction is accurate because $\frac{2}{9}$ is less than $\frac{4}{9}$.

---

1. $\frac{5}{6} \times \frac{1}{5} = $ _____

Prediction: The product will be greater than / less than $\frac{5}{6}$.

2. $\frac{9}{10} \times \frac{2}{3} = $ _____

Prediction: The product will be greater than / less than $\frac{9}{10}$.

3. $\frac{4}{9} \times \frac{2}{8} = $ _____

Prediction: The product will be greater than/ less than $\frac{4}{9}$.

4. $\frac{10}{12} \times \frac{2}{5} = $ _____

Prediction: The product will be greater than/ less than $\frac{10}{12}$.

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Lesson 25 Exit Ticket

Look at the equation and make a prediction about the product. Then use the tape diagram to model the problem and complete the equation.

1. $\frac{3}{8} \times \frac{2}{3} = ?$

Will the product be greater or less than $\frac{3}{8}$? How do you know?

_____

$\frac{3}{8} \times \frac{2}{3} =$ _____

2. $\frac{5}{6} \times \frac{3}{5} = ?$

Will the product be greater or less than $\frac{5}{6}$? How do you know?

_____

$\frac{5}{6} \times \frac{3}{5} =$ _____

Extra Practice: Fraction Match

Complete the tape diagram and solve the equation.

1. $\dfrac{3}{10} \times \dfrac{2}{3} =$ _____

1

2. $\dfrac{5}{8} \times \dfrac{3}{5} =$ _____

1

3. $\dfrac{6}{7} \times \dfrac{1}{3} =$ _____

1

4. $\dfrac{8}{9} \times \dfrac{3}{4} =$ _____

1

Three-Tape Diagrams

Three-Tape Diagrams

A Clean Sweep

Read each problem and use the fraction multiplication algorithm to solve. Write each product in lowest terms. You can draw a **tape diagram** to check your work.

1. Mateo found that 3 out of every 8 pieces of trash they collected were metal, and $\frac{1}{3}$ of the metal trash was soda cans.

   a. What expression represents the fraction of all the trash that was soda cans?

      _____

   b. What fraction of all the trash was soda cans? Show your work and write your answer in lowest terms.

      _____

2. At the end of the cleanup, Mateo found that $\frac{1}{2}$ of the trash in his bag was plastic bottles, and $\frac{2}{3}$ of the plastic bottles were water bottles.

   a. What expression represents the fraction of all the trash in Mateo's bag that was

      plastic water bottles? _____

   b. What fraction of all the trash in Mateo's bag was plastic water bottles? Show your work and write your answer in lowest terms.

      _____

3. Three out of every 5 people who picked up trash on Beach Cleanup Day were students from the local schools. Of those students, $\frac{1}{6}$ were fifth graders.

   a. What expression represents the fraction of all the people who picked up trash

      who were fifth graders? _____

   b. What fraction of all the people who picked up trash were fifth graders? Show your work and write your answer in lowest terms.

      _____

Recycle It!

Review the example problem. Then, use the fraction multiplication algorithm to solve the equations. Write each product in lowest terms.

Example

2 out of every **5** pounds of trash from the beach cleanup goes to the landfill, and $\frac{1}{4}$ of the trash going to the landfill is disposable cups and plates. What fraction of all the trash from the beach cleanup is disposable cups and plates?

Step 1	Step 2	Step 3
Multiply the numerators. $$\frac{2}{5} \times \frac{1}{4} = \frac{2}{?}$$	Multiply the denominators. $$\frac{2}{5} \times \frac{1}{4} = \frac{2}{20}$$	Divide by the greatest common factor to write the product in lowest terms. The product is $\frac{2}{20}$. The greatest common factor of 2 and 20 is 2. $$\frac{2}{20} \div \frac{2}{2} = \frac{1}{10}$$ $$\frac{2}{5} \times \frac{1}{4} = \frac{1}{10}$$

1. $\frac{3}{5} \times \frac{2}{3} =$ _____

2. $\frac{4}{6} \times \frac{1}{2} =$ _____

3. $\frac{5}{10} \times \frac{2}{4} =$ _____

4. $\frac{3}{8} \times \frac{2}{3} =$ _____

5. $\frac{1}{4} \times \frac{2}{6} =$ _____

6. $\frac{1}{2} \times \frac{3}{4} =$ _____

7. $\frac{4}{12} \times \frac{1}{3} =$ _____

8. $\frac{1}{2} \times \frac{4}{5} =$ _____

9. $\frac{8}{10} \times \frac{1}{4} =$ _____

10. $\frac{2}{7} \times \frac{3}{4} =$ _____

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Lesson 26 Exit Ticket

Part 1: Read each problem and use the fraction multiplication algorithm to solve. Reduce the products to lowest terms.

1. Of the popcorn on the shelves at Gary's Groceries, $\frac{5}{8}$ is Snappy Pop, and $\frac{1}{2}$ of the Snappy Pop is unsalted.

  a. What expression represents the fraction of all the popcorn at Food Place that is unsalted Snappy Pop?

  _____

  b. What fraction of all the popcorn at Food Place is unsalted Snappy Pop?

  _____

2. Out of all the apples Gary sells, $\frac{3}{4}$ are red apples. Two out of every 5 red apples he sells are Fuji apples.

  a. What expression represents the fraction of all the apples sold that are red Fuji apples?

  _____

  b. What fraction of all the apples sold are red Fuji apples?

  _____

Part 2: Use the fraction multiplication algorithm to solve. Write the products in lowest terms.

3. $\frac{7}{8} \times \frac{2}{3} =$ _____

4. $\frac{5}{6} \times \frac{4}{5} =$ _____

Extra Practice: Fraction Multiplication

Part 1: Read each problem. Then, write an expression to answer the question. Use the fraction multiplication algorithm to solve. Write the products in lowest terms.

1. Henry made a batch of cookies and used vanilla flavoring in $\frac{1}{2}$ of them. After he baked the cookies, he decorated $\frac{5}{6}$ of the vanilla-flavored cookies with sprinkles. What fraction of the whole batch of cookies has sprinkles?

   Expression: _____   _____ of the whole batch has sprinkles.

2. Two out of every 3 players on Kasey's soccer team are fifth graders, and $\frac{1}{3}$ of the fifth graders go to Ashville Elementary School. What fraction of all the players on Kasey's soccer team are fifth graders at Ashville Elementary School?

   Expression: _____   _____ of the players are fifth graders.

Part 2: Multiply the fractions. Write the products in lowest terms.

3. $\frac{3}{5} \times \frac{2}{3} =$ _____ = _____

4. $\frac{2}{3} \times \frac{5}{8} =$ _____ = _____

5. $\frac{4}{6} \times \frac{1}{3} =$ _____ = _____

6. $\frac{2}{6} \times \frac{4}{8} =$ _____ = _____

7. $\frac{2}{7} \times \frac{1}{2} =$ _____ = _____

8. $\frac{5}{9} \times \frac{1}{5} =$ _____ = _____

9. $\frac{1}{4} \times \frac{4}{8} =$ _____ = _____

10. $\frac{4}{6} \times \frac{2}{5} =$ _____ = _____

11. $\frac{3}{9} \times \frac{1}{2} =$ _____ = _____

12. $\frac{5}{8} \times \frac{2}{5} =$ _____ = _____

Sticker Pets

Kina orders some stickers with her dog's picture on them. Read each problem and use the area model to solve.

1. Kina orders a sticker that is $\frac{2}{3}$ of a foot long and $\frac{1}{4}$ of a foot wide.

What expression represents the

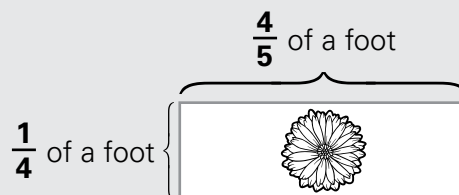area of the sticker? _____

The area of the sticker is

_____.
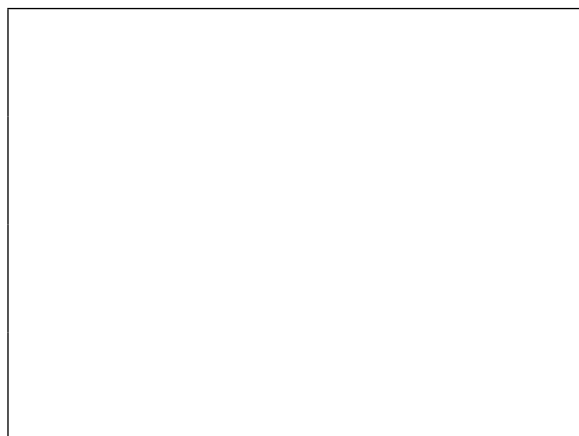
2. Kina also orders a sticker that is $\frac{4}{5}$ of a foot long and $\frac{1}{3}$ of a foot wide.

What expression represents the

area of the sticker? _____

The area of the sticker is

_____.

Window Decals

Review the example problem. Then, find the area of each decal. Show your work and write each solution in lowest terms.

Example

Kina designed some decals for her windows as well. What is the area of this flower decal?

$\frac{4}{5}$ of a foot

$\frac{1}{4}$ of a foot

Step 1

Write an expression to represent the area.

The formula for the area of a rectangle is $A = l \times w$.

The area of the sticker is $\frac{4}{5} \times \frac{1}{4}$.

Step 2

Multiply the numerators.

$$\frac{4}{5} \times \frac{1}{4} = \frac{4 \times 1}{?} = \frac{4}{?}$$

Multiply the denominators.

$$\frac{4}{5} \times \frac{1}{4} = \frac{4}{5 \times 4} = \frac{4}{20}$$

Step 3

Use division by the greatest common factor to put the fraction into lowest terms.

$$\frac{4}{20} \div \frac{4}{4} = \frac{1}{5}$$

The area of the flower decal is $\frac{1}{5}$ of a square foot.

---

1. A cat decal has a length of $\frac{2}{3}$ of a foot and a width of $\frac{3}{4}$ of a foot. What is the area of the decal?

Equation: _____

The area of the decal is _____ of a square foot.

2. A fish decal has a length of $\frac{1}{2}$ of a foot and a width of $\frac{5}{6}$ of a foot. What is the area of the decal?

Equation: _____

The area of the decal is _____ of a square foot.

3. A rabbit decal has a length of $\frac{3}{4}$ of a foot and a width of $\frac{8}{10}$ of a foot. What is the area of the decal?

Equation: _____

The area of the decal is _____ of a square foot.

4. A dog decal has a length of $\frac{4}{5}$ of a foot and a width of $\frac{5}{6}$ of a foot. What is the area of the decal?

Equation: _____

The area of the decal is _____ of a square foot.

Lesson 27 Exit Ticket

Part 1: Read the problems. Then use the area model to solve.

1. Nathalie collects stickers and puts them in a sticker book that she made. Each page of the book is $\frac{6}{7}$ of a foot long and $\frac{1}{2}$ of a foot wide.

   a. Complete the model to represent the area of the page.

   b. What is the area of each page? _____

Part 2: Read each problem. Write the multiplication expression. Then use the algorithm to solve.

2. Reyna helps her teacher hang up posters. Each poster is $\frac{5}{9}$ of a yard long and $\frac{3}{4}$ of a yard wide.

   a. What expression represents the area of a poster? _____

   b. The area of a poster is _____ of a square yard.

3. Reyna gives her friend Kina a birthday card. The card is $\frac{1}{2}$ of a foot long and $\frac{1}{4}$ of a foot wide.

   a. What expression represents the area of the card? _____

   b. The area of the card is _____ of a square foot.

Extra Practice: Saving Souvenirs

Complete the tables by finding each area using tiling or the formula $A = l \times w$.
Write each area in its simplest form.

1. For each state she has visited, Sondra has a rectangular pin that she wears on her jacket. The table shows the length and width of each pin in inches.

State Pins	Length (in.)	Width (in.)	Area (sq. in.)
Alaska	$\frac{1}{2}$	$\frac{5}{6}$	
California	$\frac{1}{4}$	$\frac{1}{3}$	
Florida	$\frac{2}{5}$	$\frac{3}{4}$	
Kansas	$\frac{2}{3}$	$\frac{3}{5}$	
Montana	$\frac{1}{3}$	$\frac{2}{3}$	
Texas	$\frac{3}{4}$	$\frac{1}{2}$	

2. Lyle collects rectangular flags from around the world. The table shows the length and width of some of the flags in his collection in yards.

Country Stamps	Length (yd.)	Width (yd.)	Area (sq. yd.)
Canada	$\frac{1}{3}$	$\frac{3}{5}$	
Italy	$\frac{1}{5}$	$\frac{1}{4}$	
Mexico	$\frac{2}{3}$	$\frac{1}{2}$	
Morocco	$\frac{1}{6}$	$\frac{4}{5}$	

Waste Not, Want Not

Use the algorithm to solve each problem. Draw a **number bond** to convert between mixed numbers and improper fractions. Check your work with **tape diagrams**.

1. Mr. Polia found that the meat department sold $\frac{2}{3}$ of $2\frac{1}{4}$ tons of ground beef last year. How much ground beef did the meat department sell last year? Show your work.

    a. The meat department sold _____ tons of ground beef.

    b. Does your tape diagram match? _____

2. Ms. Montoya reports that last year the bakery produced $5\frac{1}{3}$ tons of bread, rolls, and cakes. They had to throw out $\frac{1}{4}$ of it because it went stale before it was sold. How many tons of baked goods did the bakery throw out last year? Show your work.

    a. The bakery threw out _____ tons of baked goods.

    b. Does your tape diagram match? _____

3. After a power outage, Mr. Park had to throw out $\frac{4}{5}$ of the $3\frac{1}{3}$ tons of food in the freezers. How many tons of frozen food did Mr. Park throw out after the power outage? Show your work.

    a. Mr. Park threw out _____ tons of frozen food.

    b. Does your tape diagram match? _____

Science Report

Review the example problem. Then, read each problem and answer the question. Use **number bonds** to convert between mixed numbers and improper fractions. Write each solution as a mixed number in lowest terms.

Example

Sergio and Paul write reports about global food waste for science class. Sergio's report is $3\frac{1}{8}$ pages long. Paul's report has $\frac{3}{5}$ as many pages as Sergio's. How many pages is Paul's report?

Step 1

Write an expression to model the problem.

$3\frac{1}{8} \times \frac{3}{5}$

Step 2

Convert the mixed number to an improper fraction.
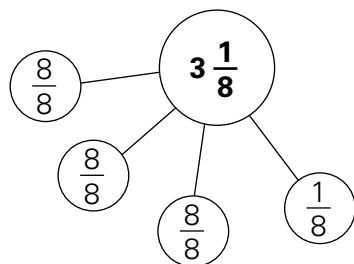
$3\frac{1}{8} = \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{1}{8} = \frac{25}{8}$

Step 3

Use the algorithm to multiply.

$3\frac{1}{8} \times \frac{3}{5} = \frac{25}{8} \times \frac{3}{5} = \frac{75}{40}$

Step 4

Write your answer as a mixed number and answer the question.

$\frac{75}{40} = 1\frac{35}{40} = 1\frac{7}{8}$

Paul's report is $1\frac{7}{8}$ pages long.

---

1. Micah spent $\frac{3}{4}$ of an hour working on his science report. Jennifer spent $1\frac{3}{5}$ times that number of hours on her report. How long did Jennifer spend on her report?

Jennifer spent _____ hours on her report.

2. Tabitha reports on a science experiment she did with $2\frac{2}{5}$ cups of water and $\frac{2}{3}$ of that number of cups of salt water. How many cups of salt water did Tabitha use?

Tabitha used _____ cups of salt water in her experiment.

3. Vivica's science report is about growing two bean plants. Plant 1 is $6\frac{2}{3}$ inches tall. Plant 2 is $\frac{7}{10}$ of that height. How tall is Plant 2?

Plant 2 is _____ inches tall.

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Lesson 28 Exit Ticket

Read the problem and answer the questions. Use a **number bond** to convert between mixed numbers and improper fractions. Write the answer as a mixed number in lowest terms.

1. Nandi buys $3\frac{1}{5}$ pounds of chicken. She also buys $\frac{3}{4}$ as many pounds of fish.

   a. How many pounds of fish does Nandi buy? Show your work.

   Nandi buys _____ pounds of fish.

   b. Draw a tape diagram to check your work.

2. Anna makes $5\frac{1}{2}$ dozen muffins, and $\frac{2}{3}$ of them are blueberry muffins. How many dozen blueberry muffins does Anna make? Show your work.

   Anna makes _____ dozen blueberry muffins.

3. Michiko takes her two cats, Xena and Felix, to the vet for checkups. Xena's weight is $\frac{1}{2}$ of Felix's weight. The vet says that Felix weighs $9\frac{1}{3}$ pounds. How much does Xena weigh? Show your work.

   Xena weighs _____ pounds.

Extra Practice: Word Problems

A local radio station has a trivia contest. Each day, the person in first place wins chocolate. The person in last place wins bubble gum. Read the problems and answer the questions. Use **number bonds** to convert between mixed numbers and improper fractions. Show your work. Write each answer as a mixed number in lowest terms.

1. Julianne won the trivia contest this week. The announcer says she won $\frac{2}{3}$ of $3\frac{3}{4}$ pounds of chocolate. How many pounds of chocolate did Julianne win? Show your work.

   Julianne won _____ pounds of chocolate.

2. When Frankie came in last place in the trivia contest, he won $\frac{3}{5}$ of $6\frac{1}{4}$ pounds of bubble gum. How many pounds of bubble gum did Frankie win? Show your work.

   Frankie won _____ pounds of bubble gum.

3. When Carla won the trivia contest, she got $\frac{8}{9}$ of $3\frac{3}{5}$ pounds of chocolate. When Ennio won, he got $\frac{5}{8}$ of $5\frac{1}{3}$ pounds of chocolate. Which person won more chocolate? Show how you know.

   Carla: _____

   Ennio: _____

   _____ won more than _____ because _____.

Tape Diagrams

Tape Diagrams

Assessment

Unit 4 Assessment

1. Manny downloads a computer file that is 80 kilobytes in size. Kim downloads a file that is $\frac{7}{8}$ the size of Manny's file. Vera downloads a file that is $\frac{5}{4}$ the size of Manny's file. Predict who downloaded the biggest file and explain why.

_____

_____

_____

_____

Draw tape diagrams to find each product. Write the multiplication equations.

Kim: _____

Vera: _____

2. On Friday, Sahil hiked 2 miles. On Saturday, he hiked $\frac{3}{4}$ of Friday's distance.

    a. Do you predict that the distance Sahil hiked on Saturday is greater than, less than, or equal to 2 miles? Why?

    _____

    _____

    b. How far did Sahil hike on Saturday? Use the tape diagram to solve.

    Sahil hiked _____ miles on Saturday.

3. Make a prediction about the size of the product. Then solve using the tape diagram.

$\frac{3}{6} \times \frac{1}{3} = ?$

Will the product be greater or less than $\frac{3}{6}$? How do you know? _____

_____

$\frac{3}{6} \times \frac{1}{3} = $ _____

4. In Ms. Peterson's class, $\frac{4}{5}$ of the students are wearing sneakers. Out of those students wearing sneakers, $\frac{3}{4}$ wear jeans. What fraction of the students in Ms. Peterson's class wears both sneakers and jeans? Make a tape diagram to show your work.

_____ of the students are wearing sneakers and jeans.

5. Make a prediction about the size of the product and solve using a tape diagram.

$\frac{3}{4} \times \frac{1}{3} = ?$

Will the product be greater or less than $\frac{1}{3}$? How do you know? _____

_____

$\frac{3}{4} \times \frac{1}{3} =$ _____

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6. Out of all the people who bought drinks at Jack's Snacks, $\frac{4}{5}$ bought iced tea. Jack noticed that $\frac{1}{2}$ of those people bought raspberry iced tea. What fraction of all the people who bought drinks bought raspberry iced tea? Use the fraction multiplication algorithm to solve. Reduce the product to lowest terms. Show your work.

_____ of the people who bought drinks bought raspberry iced tea.

7. Use the fraction multiplication algorithm to solve. Write the product in lowest terms. Show your work.

$\frac{3}{8} \times \frac{2}{3} =$ _____

8. What is the area of a rectangular postage stamp that is $\frac{3}{4}$ inch long and $\frac{2}{3}$ inch wide? Use an area model. Write the multiplication equation and write the answer in lowest terms. Show your work.

Equation: _____

The area of the sticker is _____ square inch.

9. When Darby makes cornbread, she uses $4\frac{2}{3}$ cups of cornmeal and $\frac{1}{4}$ of that amount of flour. How many cups of flour does Darby use?

   a. Draw a number bond to convert the mixed number to a proper fraction.

   b. Use the fraction multiplication algorithm to multiply.

   c. Draw a number bond to convert the product to a mixed number.

     Darby uses _____ cups of flour.

10. Multiply using the multiplication algorithm. Then use a number bond to convert the product to a mixed number.

$$\frac{17}{2} \times \frac{1}{6} = \underline{}$$

Mixed number: _____

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Unit 4 Cumulative Review

1. Jaleesa spent 3 times as many minutes working on her science project as she spent on her math homework. She spent 45 minutes on science. How many minutes did she spend on math? Show your work.

   Jaleesa spent _____ minutes on math.

2. Felix gets a free mini-poster with a new video game. The poster is $\frac{5}{6}$ of a foot long and $\frac{3}{4}$ of a foot wide. What is the area of the poster? Show your work and write the answer in simplest form.

   The area of the poster is _____ of a square foot.

3. Solve using partial quotients. Show your work.

   $7,734 \div 6 =$ _____

4. Complete the number string.

$5 \times 10^1 = 50$

$5 \times 10^2 = 500$

$5 \times 10^3 =$ _____

$5 \times 10^4 = 50{,}000$

5. Mercedes bought a comic book for $4.95 and a package of chewing gum for $1.08. What is the total amount Mercedes spent? Show your work.

Mercedes spent _____.

6. Compare the fractions. Use the >, <, or = symbol.

$\dfrac{7}{8}$ $\bigcirc$ $\dfrac{5}{6}$

7. Multiply.

$\dfrac{2}{3} \times 8 =$ _____

8. Divide using the standard algorithm. Show your work.

8,505 ÷ 27 = _____

9. Juaquina has a cantaloupe that weighs $1\frac{7}{8}$ pounds and a watermelon that weighs $3\frac{5}{8}$ pounds. What is the total weight of the melons?

The total weight of the melons is _____ pounds.

10. The ordered pairs show the number of hours that have passed (x) and the number of miles (y) Artemis and Travis have ridden on a bicycle trip: (0, 0), (1, 3), (2, 6), (3, 9), (4, 12). Plot the points on the graph and complete the sentence.

When Artemis and Travis have ridden for 3 hours, they have gone _____ miles.
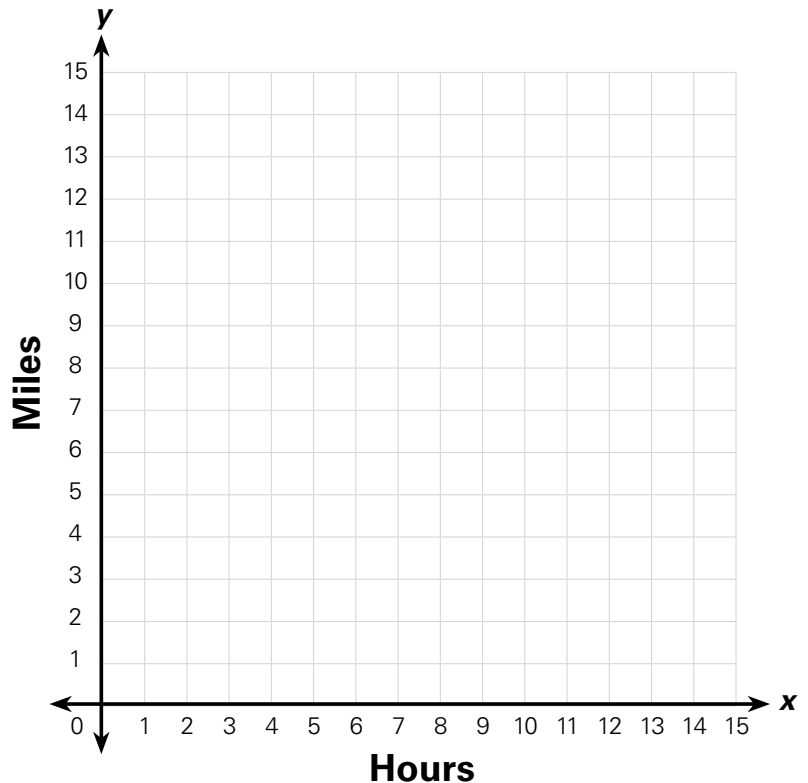
11. Complete the number string.

$$\frac{3}{1} = 3.0$$

$$\frac{3}{10} = \underline{\hspace{2cm}}$$

$$\frac{3}{100} = 0.03$$

$$\frac{3}{1000} = 0.003$$

12. Locate 0.2 and 0.15 on the number line. Then, use the >, <, = symbols to compare 0.2 and 0.15.
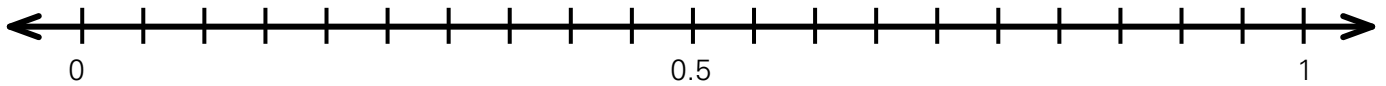
0.2 ◯ 0.15

13. Find the equivalent fraction.

$$\frac{4}{5} = \frac{\square}{15}$$

14. Andres is making a scrapbook with pictures from his recent baseball season. He plans to put 4 pictures on each page of the scrapbook. How many pages will he need for 22 pictures? How do you know?

_____

_____

_____

15. Complete the area model to find the product of 56 × 39.
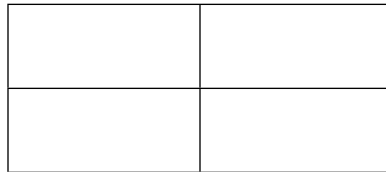
56 × 39 = _____

Unit 5:

Fraction Division

Pioneer Life

Use **fraction strips** to model the problems. Answer the questions.

1. Terence, Katya, Niko, Gina, and Aisha decide to try churning butter. They make 4 pounds of butter. They want to share the butter equally.

How many pounds of butter are there? _____ pounds	How many students are there? _____ students	What division expression models the problem? _____
How much butter should each student get? Each student should get _____ of a pound of butter.		

2. Monica, Abel, Parvati, Keko, and Casey also try butter-churning. They make 2 pounds of butter and want to share it equally.

How many pounds of butter are there? _____ pounds	How many students are there? _____ students	What division expression models the problem? _____
How much butter should each student get? Each student should get _____ of a pound of butter.		

3. Denise, Ava, Mika, Joon, Ali, and Rita make 1 quart of strawberry jam. They plan for each person to take home the same amount of jam.

How many quarts of jam are there? _____ quart	How many students are there? _____ students	What division expression models the problem? _____
How much jam should each student get? Each student should get _____ of a quart of jam.		

Room to Grow

Review the example problem. Then use a **tape diagram** to solve each problem.

Example

Darien's class visits a model pioneer farm. The farmer tells the students that the farm grows corn, wheat, barley, and soybeans on a field that is **3** acres in area. Each crop uses an equal part of the field. How many acres does each crop take up?

Step 1

Write an expression to represent the problem.

The **3**-acre field is equally divided among **4** crops: **3 ÷ 4**.

Step 2

Draw a tape diagram showing the whole.

Since there are **3** acres being divided, **3** is the whole.

3		
1	1	1
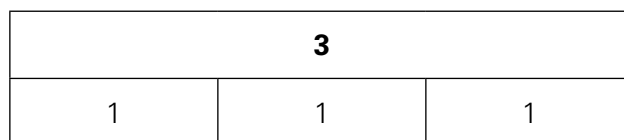
Step 3

Divide the bottom bar according to the divisor.

Since **3** acres are being divided among **4** crops, divide each acre into $\frac{1}{4}$ pieces.

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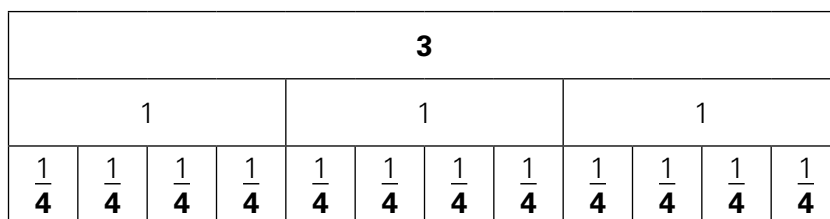
Step 4

Make groups according to the divisor.

Since the divisor is **4**, make **4** groups.

I made **4** groups of $\frac{3}{4}$, so each crop takes up $\frac{3}{4}$ of an acre: **3 ÷ 4** = $\frac{3}{4}$.

3											
1				1				1			
$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
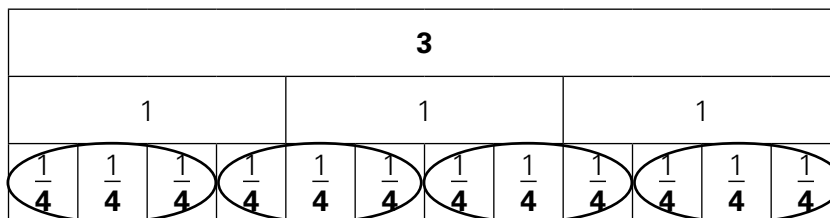
1. 4 ÷ 7 = _____

2. 3 ÷ 5 = _____

3. 5 ÷ 8 = _____

4. 4 ÷ 10 = _____

5. 2 ÷ 9 = _____

6. 2 ÷ 6 = _____

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Lesson 30 Exit Ticket

Part 1: Read each problem. Use **fraction strips** to model the problem. Answer the questions.

1. Kerry, Dev, and Tyrell made yarn for their social studies project. They spun 2 yards of yarn, and they want to share it equally.

How many yards of yarn are there? _____ yards	How many students are there? _____ students	What division expression models the problem? _____
How much yarn should each student get? Each student should get _____ of a yard of yarn.		

2. Matías has 3 pints of paint to paint 4 chairs. He uses all the paint and uses the same amount on each chair.

How many pints of paint are there? _____ pints	How many chairs are there? _____ chairs	What division expression models the problem? _____
How much paint will be used on each chair? Each chair should get _____ of a pint of paint.		

Part 2: Use the tape diagram to solve the problem.

3. 3 ÷ 6 = _____

Extra Practice: Dividing It Up

Read the problems and answer the questions using the method of your choice.

1. Wednesday night is pizza night for Mr. and Mrs. Johnson and their 3 children. They order 2 large pizzas. If each person gets an equal share, what fraction of a pizza does each person get?

Each person gets _____ of a pizza.

2. Tori knows that it takes 2 full pitchers of lemonade to fill 9 same-size glasses. What fraction of a pitcher of lemonade is in each glass?

Each glass gets _____ of a pitcher.

3. Willem grows carrots, lettuce, tomatoes, peppers, and onions in his garden. Each vegetable takes up the same area. Willem spreads 3 pounds of compost evenly over the whole garden. How many pounds of compost does each vegetable get?

Each vegetable gets _____ of a pound of compost.

4. Before Dafna, Rudi, and Mai go on a hike, they each fill a water bottle. The bottles each hold the same amount, and it takes 2 quarts of water to fill all of them. How much water is in each bottle?

Each bottle has _____ of a quart of water.

5. A road-building crew with 7 workers has to move 4 tons of gravel. If each member of the crew does the same amount of work, how many tons of gravel does each person move?

Each person moves _____ of a ton of gravel.

Number Triangles

28 ÷ ÷ **7** × [ ]	**36** ÷ ÷ **6** × [ ]
18 ÷ ÷ **3** × [ ]	**54** ÷ ÷ **6** × [ ]
81 ÷ ÷ **9** × [ ]	**100** ÷ ÷ **10** × [ ]

Three-Tape Diagrams

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Three-Tape Diagrams

Three-Tape Diagrams

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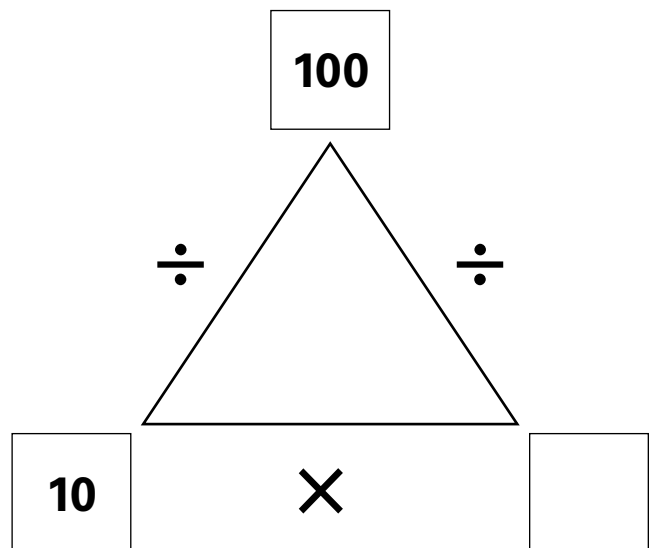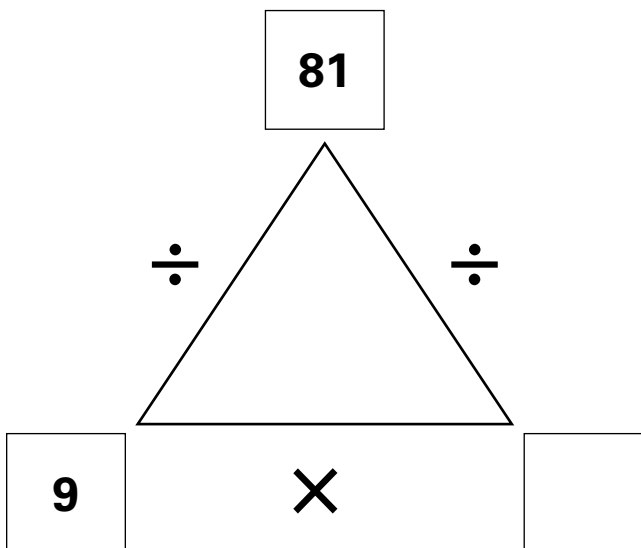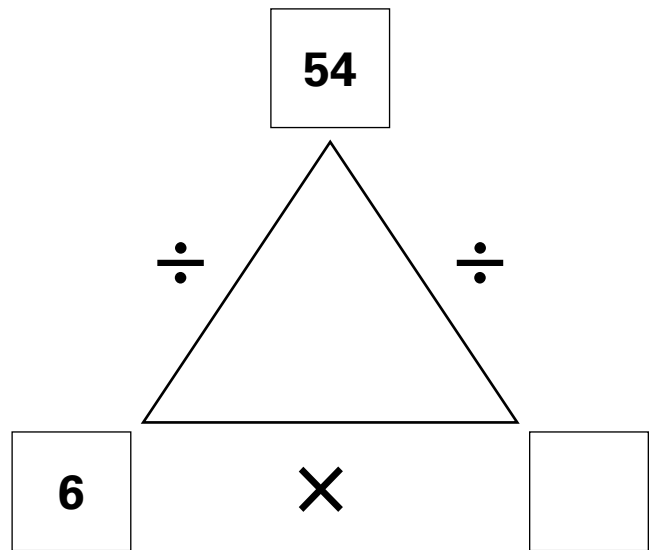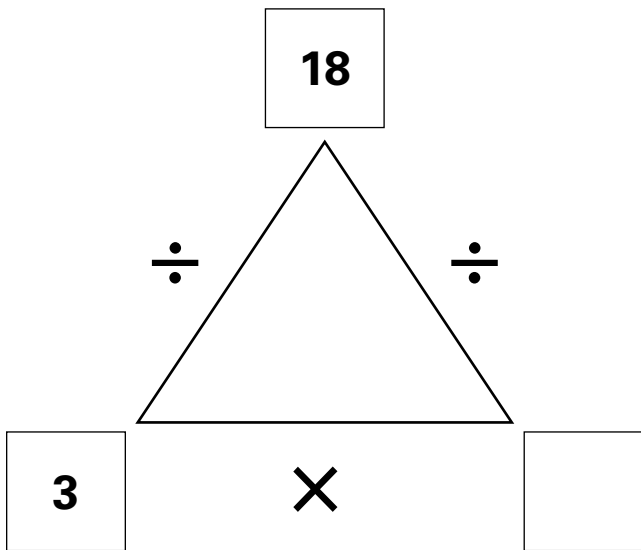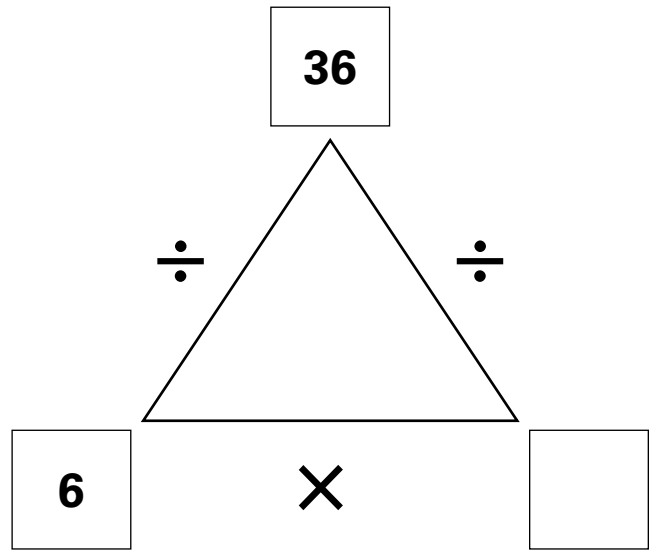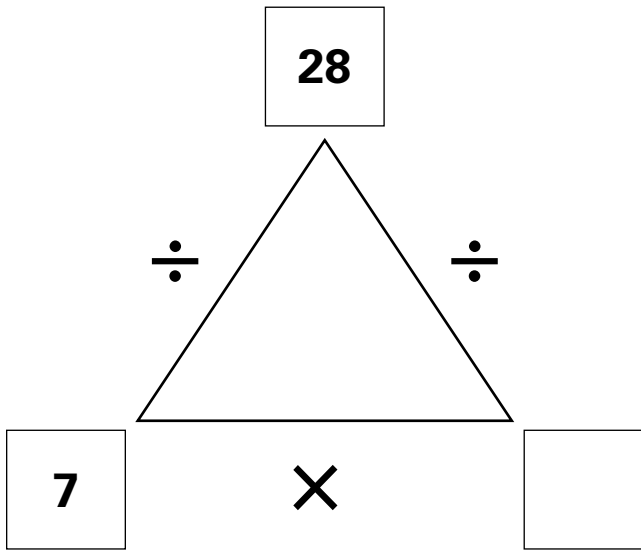
All in a Row

Read each problem. Use **fraction strips** to model the problem. Then write a division expression and solve.

1. Jackson is making a mosaic with rows of wooden squares. Each square is $\frac{1}{8}$ of a foot wide. The rows of squares have to stretch across a frame that is 2 feet wide. How many squares should Jackson use for each row?

Expression: _____

Jackson should use _____ squares for each row.

2. Bai is also making a mosaic. She is using rows of square clay tiles. Each tile is $\frac{1}{3}$ of a foot wide. Bai plans for the rows of tiles to stretch across a frame that is 3 feet wide. How many tiles should Bai use for each row?

Expression: _____

Bai should use _____ squares for each row.

3. Ahmad makes a collage with square photos in rows on a background that is 3 feet wide. Each photo is $\frac{1}{6}$ of a foot wide. How many photos will fit in a row?

Expression: _____

_____ photos will fit in a row.

4. Maya wants to display square tiles in rows on a wall that is 4 feet wide. Each tile is $\frac{1}{8}$ of a foot wide. How many tiles will fit in a row?

Expression: _____

_____ tiles will fit in a row.

In the Library

Review the example problem. Then read each problem and write an expression to model the division. Draw a **tape diagram** to solve.

Example

Darrell shelves books at the library. The books in the *Triple Trouble* series are very popular. When Darrell shelves all the books in the series, they fill their own shelf that is **2** feet long. Each book in the series is $\frac{1}{6}$ of a foot thick. How many books are in the *Triple Trouble* series?

Step 1

Write an expression to model the problem.

The **2**-foot-long shelf is being divided by each book length. Each book is $\frac{1}{6}$ of a foot thick: $2 \div \frac{1}{6}$.

Step 2

Model the whole with a tape diagram.

The whole is the number being divided: **2**.

2	
1	1
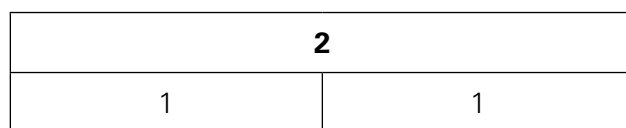
Step 3

Divide each whole into parts according to the divisor.

The divisor is $\frac{1}{6}$, so each whole should be divided into 6 pieces, since six $\frac{1}{6}$ parts make a whole.

2											
1						1					
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
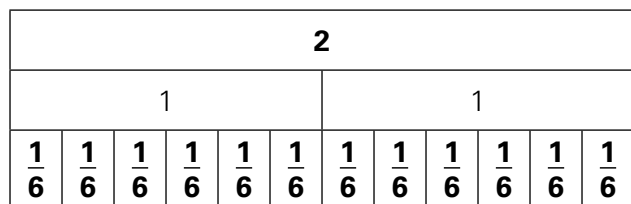
Step 4

Count the number of parts to find the quotient.

There are 12 parts, so $2 \div \frac{1}{6} = 12$.

There are 12 books in the *Triple Trouble* series.

---

1. Darrell checks out a stack of library books that is 3 feet tall. Each book is $\frac{1}{4}$ of a foot thick. How many books does Darrell check out?

   Expression: _____   Darrell checks out _____ books.

2. The library's biggest bookcase is 2 yards wide. Each section of the bookcase is $\frac{1}{2}$ of a yard wide. How many sections does the bookcase have?

   Expression: _____   The bookcase has _____ section.

Lesson 31 Exit Ticket

Part 1: Read the problems. Use **fraction strips** to model the problems. Then write an expression and solve.

1. Matilda is making a table top out of rows of square tiles. The table top is 5 feet long. The tiles are $\frac{1}{3}$ of a foot long. How many tiles will fit in a row?

Expression: _____   _____ tiles will fit in a row.

Part 2: Read the problems. Write an expression to model the division, then use the tape diagram to model the problem.

2. Ginny makes a collage with stickers in rows across a sheet of paper that is 2 feet wide. Each sticker is $\frac{1}{8}$ of a foot wide. How many stickers will fit in a row?

Expression: _____   _____ stickers will fit in a row.

3. Banjeet lays down rows of bricks to make a rectangular patio. The patio is 6 feet long, and each brick is $\frac{1}{2}$ of a foot long. How many bricks does Banjeet use in each row?

Expression: _____   Banjeet uses _____ bricks in each row.

Extra Practice:
Dividing Wholes by Fractions

Read the problems. Model dividing a whole number by a unit fraction using any model of your choosing.

1. Ms. Michaels is preparing lunches in the cafeteria. Each lunch includes $\frac{1}{4}$ of an apple. How many lunches can Ms. Michaels prepare using 9 apples?

Ms. Michaels can make _____ lunches.

2. Tasha is making the awards for her school's art show. Each award should include a ribbon that is $\frac{1}{9}$ of a yard long. How many awards can Tasha make from 2 yards of ribbon?

Tasha can make _____ awards.

3. A full pitcher of fruit punch holds 8 pints. How many $\frac{1}{2}$-pint servings of fruit punch are in a full pitcher?

A full pitcher can hold _____ servings of fruit punch.

4. Bakari plans to make tacos for dinner. He has 3 pounds of ground beef. If he puts $\frac{1}{5}$ of a pound of beef in each taco, how many tacos can he make?

Bakari can make _____ tacos.

5. Hansi eats $\frac{1}{3}$ of a cantaloupe every morning at breakfast. If Hansi buys 4 cantaloupes, for how many days can he have cantaloupe at breakfast?

Hansi can eat cantaloupe for breakfast for _____ days.

Number Bonds

Number bond 1: Top circle **1**, branching to two circles: $\frac{1}{2}$ and an empty circle.

Number bond 2: Top circle **1**, branching to five circles: four empty and $\frac{1}{5}$.

Number bond 3: Top circle **1**, branching to four circles: three empty and $\frac{1}{4}$.

Number bond 4: Top circle **1**, branching to three circles: $\frac{1}{3}$ and two empty.

Number bond 5: Top circle **1**, branching to six empty circles.
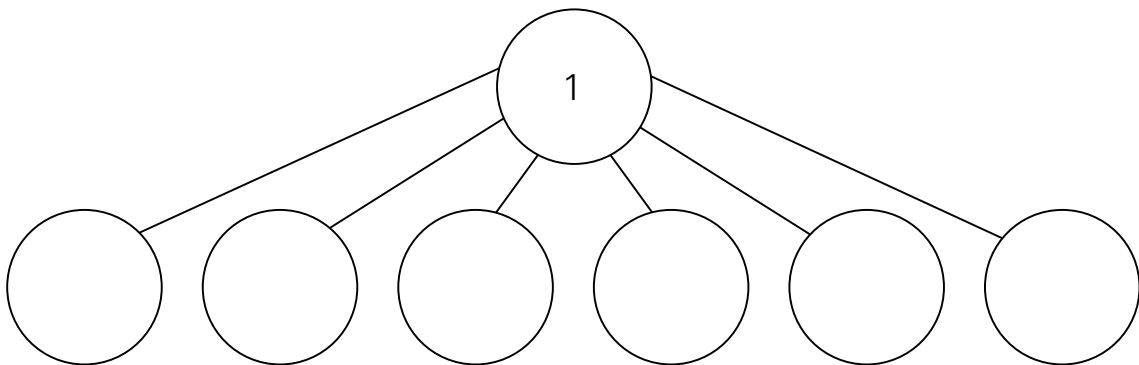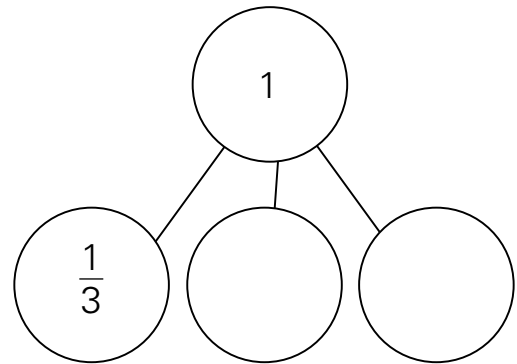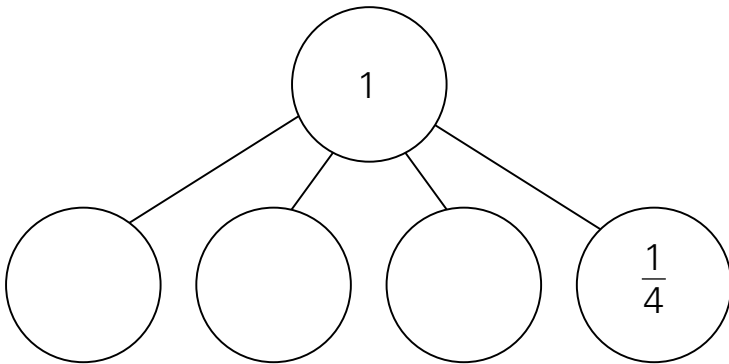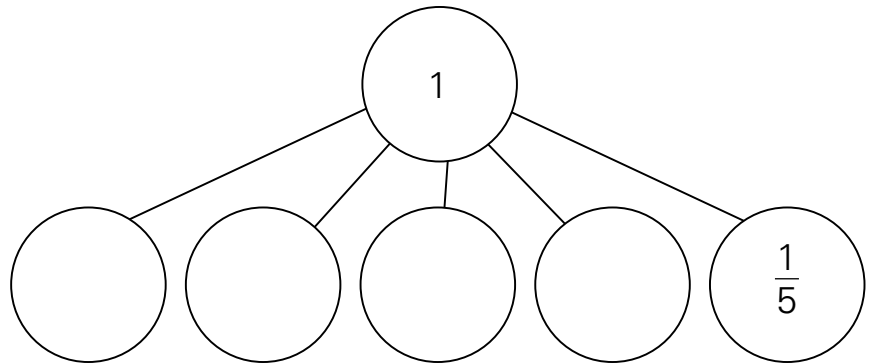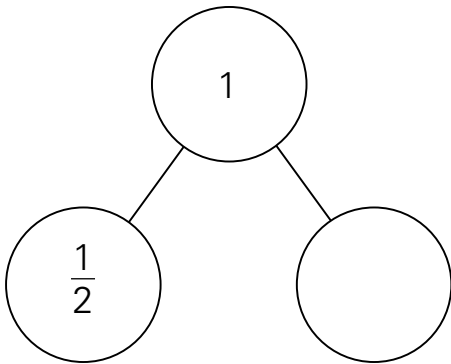
Three-Tape Diagrams

Money Management

Part 1: Model the problem with **fraction tiles**. Write a division expression to model the problem and solve.

1. Angus had $\frac{1}{6}$ of his summer job earnings left by October. He split the remaining money into 2 equal parts—one to save and one to donate. How much of Angus's earnings did he donate?

Expression: _____   Angus donated _____ of his summer earnings.

2. Ms. Chu saved money to spend on her classroom. She divided the money evenly to spend on five things: books, art supplies, a storage cabinet, snacks, and a whiteboard easel. How much of her money did Ms. Chu spend on each book if she bought 2 books and each one cost the same?

Expression: _____   Ms. Chu spent _____ of her money on each book.

Part 2: Read each problem and make a **tape diagram**. Write a division expression to model the problem and solve.

3. Jena has money to buy gifts. She spends $\frac{1}{2}$ of her money on friends. Jena buys gifts for 4 friends and spends the same on each gift. How much of her money does Jena spend on each friend?

Expression: _____   Jena spends _____ of her money on each friend.

4. Enrique divides his babysitting money equally among buying clothes, saving for a computer, going to movies, and donating. He donates equal amounts to 3 wildlife rescue groups.

Expression: _____   Enrique spends _____ of his money on each group.

Art Supplies

Review the example problem. Draw a **tape diagram** and solve each division problem.

Example

Adnan, Benji, Carina, D'Andre, Erica, and Filipe are working on a collage. They split a package of colored paper evenly among themselves. Each student has an equal amount of blue and green paper. What fraction of the package is Carina's blue paper? Use the expression $\frac{1}{6} \div 2$ to solve.

Step 1

Make a tape diagram showing how much of the package of paper each student gets.

The whole is split into 6 equal parts because there are 6 students working on the collage.

		1			
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

Step 2

Divide each share of paper into two equal parts, since Carina has **2** colors of paper.

Each $\frac{1}{6}$ part is split into **2** equal parts to show the equal parts of blue and green paper.

		1			
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

Step 3

Count the total number of parts and write the unit fraction in the tape diagram. The unit fraction is the quotient.

Since there are 12 parts, each part is $\frac{1}{12}$ of the whole.

Carina's blue paper is $\frac{1}{12}$ of the whole package.

				1						
$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

1. $\frac{1}{5} \div 3 = ?$ _____

2. $\frac{1}{4} \div 4 = ?$ _____

3. $\frac{1}{2} \div 2 = ?$ _____

4. $\frac{1}{4} \div 3 = ?$ _____

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Lesson 32 Exit Ticket

Part 1: Model the problem with **fraction tiles**. Fill in the blank with the solution.

1. At a knitting store, Marnie buys a bag that is $\frac{1}{2}$ red yarn and $\frac{1}{2}$ yellow yarn. Her knitting club has 5 members total, and the members split the colors evenly. How much of the yellow yarn does Marnie keep as her share?

   Expression: _____   Marnie keeps _____ of the yellow yarn.

Part 2: Use the tape diagram to model and solve each problem.

2. $\frac{1}{5} \div 3 =$ _____

3. $\frac{1}{3} \div 3 =$ _____

Extra Practice: Your Slice Pizza

Tino just started a new job as a pizza slicer at Your Slice Pizza restaurant. Tino's boss gives him a chart that shows the steps to slice a pizza to get different sizes of slices. Unfortunately, the chart is not complete. Use what you know about dividing unit fractions by whole numbers to complete the chart. Use any method of your choice to model the situations.

Step 1: Cut the pizza into this number of equal slices.	Step 2: How much of the pizza is one slice?	Step 3: Split each slice into this number of equal slices.	Step 4: How much of the pizza is each new slice?
2		6	
2		5	
3		7	
4		2	
5		3	
5		4	
6		3	

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Three-Tape Diagrams

Three-Tape Diagrams

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Science Presentation

Use the fraction division algorithm to complete each equation. Check your work on a **tape diagram** and explain how you know your answer is reasonable.

1. $\dfrac{1}{6} \div 3 =$ _____ $\times$ _____ $=$ _____

My answer is reasonable because _____

_____ .

2. $\dfrac{1}{4} \div 4 =$ _____ $\times$ _____ $=$ _____

My answer is reasonable because _____

_____ .

3. $3 \div \dfrac{1}{5} =$ _____ $\times$ _____ $=$ _____

My answer is reasonable because _____

_____ .

4. $2 \div \dfrac{1}{3} =$ _____ $\times$ _____ $=$ _____

My answer is reasonable because _____

_____ .

5. $\dfrac{1}{5} \div 2 =$ _____ $\times$ _____ $=$ _____

My answer is reasonable because _____

_____ .

Ribbons

Review the example problem. Then use the fraction division algorithm to find the products. Show your work.

Example

Jillian has **6** yards of ribbon. She needs to cut $\frac{1}{3}$-yard pieces of ribbon. How can she find out what $6 \div \frac{1}{3}$ is, so she knows how many pieces she can cut?

Step 1	**Step 2**	**Step 3**
Find the reciprocal of the divisor. The reciprocal of $\frac{1}{3}$ is $\frac{3}{1}$.	Change the division to multiplication by the reciprocal. $6 \div \frac{1}{3} = 6 \times \frac{3}{1}$	Use the rules for multiplying by a fraction to solve. Multiply the whole number by the numerator of the fraction. $6 \times \frac{3}{1} = \frac{18}{1} = 18$

1. $4 \div \frac{1}{3} =$ _____

2. $\frac{1}{2} \div 8 =$ _____

3. $\frac{1}{5} \div 3 =$ _____

4. $5 \div \frac{1}{4} =$ _____

5. $6 \div \frac{1}{4} =$ _____

6. $12 \div \frac{1}{4} =$ _____

7. $\frac{1}{8} \div 3 =$ _____

8. $\frac{1}{10} \div 2 =$ _____

9. $3 \div \frac{1}{3} =$ _____

10. $\frac{1}{3} \div 3 =$ _____

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Lesson 33 Exit Ticket

Part 1: Use the fraction division algorithm to complete each equation. Check your work with a **tape diagram** and explain how you know your answer is reasonable.

1. $\frac{1}{3} \div 6 =$ _____ $\times$ _____ $=$ _____

My answer is reasonable because _____

_____.

2. $2 \div \frac{1}{5} =$ _____

My quotient is reasonable because _____

_____.

Part 2: Write the multiplication expression you can use to solve each division problem. Then use the fraction division algorithm to solve.

3. $8 \div \frac{1}{3} =$ _____   Multiplication expression: _____

4. $\frac{1}{2} \div 4 =$ _____   Multiplication expression: _____

Extra Practice: Don't Be Unreasonable!

Circle the correct quotient. Then use the fraction division algorithm to verify your choice. Explain why the other choice is not a reasonable answer.

Expression	Quotient	Verify	Explanation
$3 \div \dfrac{1}{3}$	1 or 9		
$\dfrac{1}{2} \div 5$	$\dfrac{1}{10}$ or 10		
$\dfrac{1}{4} \div 2$	$\dfrac{1}{8}$ or 2		
$8 \div \dfrac{1}{4}$	$\dfrac{1}{2}$ or 32		
$\dfrac{1}{6} \div 3$	$\dfrac{1}{18}$ or 18		

Three-Tape Diagrams

Three-Tape Diagrams

Three-Tape Diagrams

Three-Tape Diagrams

Divide and Conquer

Read the problems. Then use the method of your choice to answer the questions.

1. Mr. Reed has $\frac{1}{6}$ of an hour to make 4 announcements to his students. How much time should he spend on each announcement?

   a. Write a division expression. _____

   b. Mr. Reed should spend _____ of an hour on each announcement.

   c. My answer is reasonable because _____

   _____.

2. Hina is the leader of her school's Art Club. She plans to spend $\frac{1}{3}$ of an hour making a presentation at the next meeting about 4 topics: fundraising, activities, new members, and future plans. How much time should she spend on each topic?

   a. Write a division expression. _____

   b. Hina should spend _____ of an hour talking about each topic.

   c. My answer is reasonable because _____

   _____.

3. The public comment period of a school board meeting lasted 2 hours. People spoke to the board members and asked questions. Each speaker took $\frac{1}{10}$ of an hour. How many people spoke?

   a. Write a division expression. _____

   b. There were _____ people who spoke during the public comment period.

   c. My answer is reasonable because _____

   _____.

Doctor's Office

Review the example problem. Then read each problem and write an expression that models it. Solve using any method you choose.

Example

Dr. Avila spends $\frac{1}{3}$ of an hour with each of her patients. On Tuesday, she spent **8** hours with patients.

How many patients did Dr. Avila see on Tuesday?

Step 1	**Step 2**	**Step 3**
Write an expression to model the problem. How many $\frac{1}{3}$-hour parts are in **8** hours? $8 \div \frac{1}{3}$	Change the divisor to its reciprocal and write a multiplication expression. The reciprocal of $\frac{1}{3}$ is $\frac{3}{1}$, and $\frac{3}{1} = 3$. $8 \div \frac{1}{3} = 8 \times 3$	Multiply. $8 \times 3 = 24$ Dr. Avila saw 24 patients on Tuesday.

1. Max sees Dr. Avila for a checkup. She gives him a bottle of 12 vitamins and tells him to take $\frac{1}{2}$ of a vitamin each day. How many days will it take Max to use all the vitamins?

   Expression: _____   It will take Max _____ days.

2. Dr. Avila's nurse spends $\frac{1}{5}$ of an hour with Max. She completes 4 checks: blood pressure, heart rate, weight, and height. If she spends the same time on each check, how long does each check take?

   Expression: _____   Each check takes _____ of an hour.

3. Dr. Avila goes to a presentation to learn about a new medication. The presentation lasts $\frac{1}{2}$ hour. It has 3 parts. How long is each part?

   Expression: _____   Each part is _____ of an hour.

Lesson 34 Exit Ticket

Write a division expression to model each problem. Then solve using the method of your choice and explain how you know your answer is reasonable.

1. Coach Harvey brings 5 gallons of water to soccer practice. How many $\frac{1}{4}$-gallon sports bottles can he fill?

    a. Expression: _____

    b. Coach Harvey can fill _____ bottles.

    c. My answer is reasonable because _____

    _____.

2. Javier wants to drink 3 quarts of water each day. His water bottle holds $\frac{1}{2}$ quart. How many times each day will Javier need to fill his water bottle?

    a. Expression: _____

    b. Javier will need to fill his bottle _____ times each day.

    c. My answer is reasonable because _____

    _____.

3. Aisha uses $\frac{1}{3}$ of her babysitting money to buy 4 posters of her favorite band. Each poster is the same price. What fraction of her money does Aisha spend on each poster?

    a. Expression: _____

    b. Aisha spends _____ of her earnings on each poster.

    c. My answer is reasonable because _____

    _____.

Extra Practice: Solve Your Way

Read the problems. Then answer the question using the method of your choice.
Show your work and explain how you know your answer is reasonable.

1. Ms. Singh is making sandwiches for the campers at Woodsy Lake Summer Camp.
Each sandwich uses $\frac{1}{10}$ of a loaf of bread. How many sandwiches can Ms. Singh
make with 3 loaves of bread?

   a. Expression: _____

   b. Ms. Singh can make _____ sandwiches.

   c. My answer is reasonable because _____

   _____.

2. Tai is making hair bows for students in the school musical. Each bow is made from
$\frac{1}{4}$ of a yard of ribbon. How many bows can Tai make from 2 yards of ribbon?

   a. Expression: _____

   b. Tai can make _____ bows.

   c. My answer is reasonable because _____

   _____.

3. Meryn has $\frac{1}{3}$ of a pound of modeling clay. If she shares the clay evenly with a
friend, how many pounds of clay does each person get?

   a. Expression: _____

   b. Each person gets _____ of a pound of clay.

   c. My answer is reasonable because _____

   _____.

Three-Tape Diagrams

Three-Tape Diagrams

Assessment

Unit 5 Assessment

1. Joanna, Raquel, Parvati, and Halah work together to make 3 dozen cookies. If they share the cookies evenly, how many dozen cookies does each person get? Use the tape diagram to solve.

| |
| |
| |

Expression: _____

Each person gets _____ dozen cookies.

2. Marquez uses 3 same-size pitchers of fruit drink to fill 6 same-size glasses. What fraction of a pitcher is in each glass? Use the tape diagram to solve.

| |
| |
| |

Expression: _____

Each glass gets _____ of a pitcher.

3. Melinda plans to display her photos in a row on her wall. The wall is 2 feet wide. Each photo is $\frac{1}{7}$ of a foot wide. How many photos can Melinda fit in a row? Use the tape diagram to solve.

Expression: _____

Melinda can put _____ photos in each row.

4. Vita is building a wall using connecting blocks. She makes the first row of blocks 8 inches wide. If each block is $\frac{1}{2}$ inch wide, how many blocks are in the first row of the wall? Use the tape diagram to solve.

Expression: _____

There are _____ blocks in the first row.

5. George has $\frac{1}{4}$ of a gallon of paint to decorate 3 storage cubes. What is the maximum amount of paint he can use on each cube if he wants to split the paint evenly among the cubes? Use the tape diagram to solve.

Expression: _____

He can use _____ of a gallon of paint on each storage cube.

6. Divide. Use the tape diagram to model and solve the problem.

$\frac{1}{3} \div 2 =$ _____

7. Tyra says that $\frac{1}{9} \div 3 = \frac{1}{27}$. Is this quotient reasonable? Explain.

_____

_____

8. Divide.

$30 \div \dfrac{1}{2} =$ _____ $\times$ _____ $=$ _____

9. Divide.

$\dfrac{1}{3} \div 6 =$ _____ $\times$ _____ $=$ _____

10. When Claudia goes for an exercise walk, she repeatedly lifts a small weight with one hand. She moves the weight to her other hand every $\dfrac{1}{4}$ of a mile. How many times does Claudia move the weight from one hand to the other during a 3-mile walk?

Expression: _____

Claudia moves the weight _____ times.

Unit 5 Cumulative Review

1. Kayla wants to make yarn pompoms to decorate her room. She knows that it takes $\frac{2}{3}$ of a yard of yarn to make a pompom. How much yarn will Kayla need to make 10 pompoms? Show your work.

Kayla will need _____ yards of yarn.

2. Martina starts an exercise program. On the first day, she walks for 10 minutes. Each day after the first day, she walks for 2 minutes more than she walked the day before. Complete the table to show how many minutes Martina walks on the first five days of the program.

Day	Time (minutes)
1	10
2	
3	
4	
5	

3. Subtract.

5.78 – 1.92 = _____

4. Jennifer has $\frac{1}{3}$ of a pound of watermelon. If she and 2 friends share the watermelon evenly, how many pounds of watermelon does each person get? Show your work.

Each person will get _____ of a pound of watermelon.

5. Add. Show your work.

$\frac{9}{10} + \frac{3}{100} =$ _____

6. Complete the number string.

4 × 10 = 40

4 × 10 × 10 = 400

4 × 10 × 10 × 10 = _____

7. A factory that makes paper clips makes 2,736 paper clips in 18 minutes. What is the average number of paper clips made per minute? Show your work.

The factory makes an average of _____ paper clips per minute.

8. Find the equivalent fraction using double number lines.

$$\frac{1}{3} = \frac{\boxed{}}{9}$$

9. Multiply.

$$\frac{1}{6} \times \frac{2}{3} = \underline{\hspace{2cm}}$$

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10. Gino's recipe for sugar cookies uses $2\frac{2}{4}$ cups of granulated sugar and $1\frac{3}{4}$ cups of brown sugar. How many cups of sugar does Gino use to make his sugar cookies? Show your work.

Gino uses _____ cups of sugar to make his cookies.

11. Bella spends $4 at the snack shop. Her friend Joon spends 3 times as much. How much money does Joon spend at the snack shop?

Joon spends _____ at the snack shop.

12. Write 16.209 in expanded form.

16.209 = _____

13. Write >, <, or = to complete the comparison.

$\frac{3}{5}$ ◯ $\frac{2}{3}$

14. Mr. Marcos earns $22 per hour. Last week he worked 38 hours, and he also earned a $95 bonus. How much money did Mr. Marcos earn last week? Then estimate to check your answer.

Mr. Marcos earned _____ last week.

Explain how you used an estimate to check your answer.

_____

_____

_____

15. Multiply.

3,705 × 429 = _____

Unit 6:

Multiplication and Division with Decimals

Weather Report

Part 1: For each expression, complete the sentence with the factors to make a prediction.

1. 0.3×5

The product will be greater than _____ and less than _____.

2. 0.2×4

The product will be greater than _____ and less than _____.

3. 6×0.5

The product will be greater than _____ and less than _____.

Part 2: Model each expression with **base-10 blocks.** Then write the product to complete the equation.

4. $0.4 \times 8 =$ _____

5. $0.7 \times 0.4 =$ _____

6. $0.3 \times 0.6 =$ _____

7. $2 \times 0.2 =$ _____

Part 3: Read each problem and answer the questions.

8. Last night, 0.9 centimeters of rain fell per hour for 2 hours.

a. What multiplication expression represents the total rainfall? _____

b. Will the total rainfall be greater than the rainfall per hour? _____

c. Will the total rainfall be greater than the number of hours? _____

d. What is the total rainfall? _____

9. Tomorrow, we expect 0.5 centimeters of rain per hour to fall for 0.5 hour.

a. What multiplication expression represents the total rainfall? _____

b. Will the total rainfall be greater than the rainfall per hour? _____

c. Will the total rainfall be greater than the number of hours? _____

d. What is the total rainfall? _____

Data Download

Part 1: Read each problem and use **base-10 blocks** to model it. Answer the questions.

1. Ray's computer can download 0.2 megabytes of data per second.

   a. What expression represents the amount of data the computer can download in 8 seconds? _____

   b. Predict how the total amount of data downloaded compares to the number of seconds. How did you make your prediction?

   _____

   _____

   _____

   c. How many megabytes can the computer download in 8 seconds? _____

2. Ty's computer can download 0.4 megabytes of data per second.

   a. What expression represents the amount of data the computer can download in 0.5 seconds? _____

   b. Predict how the total amount of data downloaded compares to the download rate per second. How did you make your prediction?

   _____

   _____

   _____

   c. How many megabytes can the computer download in 0.5 seconds? _____

Part 2: Model each expression with **base-10 blocks**. Then write the product to complete the equation.

3. $9 \times 0.3 = $ _____

4. $0.7 \times 5 = $ _____

Lesson 36 Exit Ticket

Part 1: For each expression, complete the sentence with the factors to make a prediction.

1. 0.4×7

The product will be greater than _____ and less than _____.

2. 0.6×8

The product will be greater than _____ and less than _____.

3. 9×0.3

The product will be greater than _____ and less than _____.

Part 2: Read the problem and answer the questions.

4. Francisco's phone can download 0.7 megabytes of data per second.

  a. What expression represents the amount of data his phone can download in 0.8 seconds? _____

  b. Predict how the total amount of data downloaded compares to the number of seconds. How did you make your prediction?_____

_____

_____

  c. Model using **base-10 blocks.** How many megabytes of data can the phone download in 0.8 seconds? _____

Part 3: Model each expression with **base-10 blocks.** Then write the product to complete the equation.

5. $0.2 \times 4 =$ _____

6. $0.3 \times 0.3 =$ _____

Extra Practice: Agree or Disagree?

Part 1: Read each problem. Next to each prediction, circle the word *Agree* or cross out the prediction and write your own. Then answer the question. Use a **base-10 block** model to help you.

1. Caryn uses 0.3 pounds of clay to make a mug. How many pounds of clay would she need to make 5 mugs?

    a. I predict the product is greater than 0.3 pounds and less than 5 pounds.　**Agree**

    b. Caryn will need _____ pounds of clay.

2. Norris types 0.5 of a page per minute. How many pages can he type in 0.5 minutes?

    a. I predict the product is greater than 0.5 pages.　**Agree**

    b. Norris can type _____ pages.

3. Andre buys 4 cans of paint. Each can weighs 0.9 kilograms. What is the total weight of the paint?

    a. I predict the product is greater than 0.9 kilograms and greater than 4 kilograms.　**Agree**

    b. The total weight of the paint is _____ kilograms.

Part 2: Model each expression with **base-10 blocks**. Then write the product to complete the equation.

4. $0.3 \times 5 =$ _____

5. $0.4 \times 0.4 =$ _____

6. $0.5 \times 0.2 =$ _____

7. $7 \times 0.4 =$ _____

8. $3 \times 0.7 =$ _____

9. $0.6 \times 6 =$ _____

Farmers' Market

Read the problems and answer the questions. Write your solutions as a decimal.

1. Radishes at the market cost $0.40 per pound. Kent buys 0.2 of a pound.

   a. Will the amount be greater or less than $0.40? Explain. _____

     _____

   b. Multiply and show your work.

     Kent pays $_____ for radishes.

2. The price of celery is $0.80 per pound. Ginny buys 0.7 of a pound.

   a. Will the amount be greater or less than 0.7? Explain. _____

     _____

   b. Multiply and show your work.

     Ginny pays $_____ for celery.

3. Nita sells cherries at her farmers' market booth for $0.70 per pound. How much does Nita earn when she sells 0.4 of a pound of cherries?

   a. Will the amount be greater or less than $0.70? _____

     _____

   b. Multiply and show your work.

     Nita earns $_____ for the cherries she sells.

4. The price of a pound of blueberries is $0.95. Vivica buys 0.6 of a pound of blueberries. How much does Vivica pay for these blueberries?

   a. Will the amount be greater or less than $0.95? _____

     _____

   b. Multiply and show your work.

     Vivica pays $_____ for the blueberries.

Fresh Fruit

Review the example problem. Then use the equivalent fractions method to multiply decimals. Show your work. Write the solution.

Example

When William closes his booth at the farmers' market, he still has **0.98** pounds of peaches. He uses **0.4** parts of the peaches to make smoothies. How many pounds of peaches does William use?

Step 1

Write an expression to model the problem.

William uses **0.4** of **0.98** pounds of peaches.

0.4 × 0.98

Step 2

Write an equivalent fraction for each factor.

$0.4 = \dfrac{4}{10}$

$0.98 = \dfrac{98}{100}$

Step 3

Multiply the fractions.

$\dfrac{4}{10} \times \dfrac{98}{100} = \dfrac{392}{1,000}$

Step 4

Convert the product to a decimal.

$\dfrac{392}{1,000} = 0.392$

William uses 0.392 pounds of peaches to make smoothies.

1. Quinn eats 0.33 parts of the 0.8 of a gallon of fresh strawberry ice cream that her sister Melinda made. How many gallons of ice cream does Quinn eat?

   Quinn eats _____ gallons of the ice cream.

2. Bernardo makes a blueberry pie on Sunday. By Sunday night, only 0.75 of the pie is left. On Monday, he eats 0.3 parts of the remaining pie. What part of the whole pie does Bernardo eat on Monday?

   Bernardo eats _____ of the pie on Monday.

3. Ling gathers 0.91 pounds of lemons. She makes lemonade with 0.5 of the lemons. How many pounds of lemons does Ling use to make lemonade?

   Ling uses _____ pounds of lemons.

Lesson 37 Exit Ticket

Read the problems and answer the questions. Write your solution as a decimal.

1. The price of beans is $0.90 per pound. Sooyoon buys 0.9 of a pound of beans. How much does Sooyoon pay? Show your work with fractions.

Sooyoon pays $_____ for beans.

2. James sells homemade taffy at his market booth for $0.60 per pound. How much does James earn for selling 0.8 pounds of taffy?

James earns $_____.

3. Misha plans to buy 0.6 gallons of apple cider. The cider costs $0.85 per gallon.

    a. Will the total cost be greater or less than $0.85? _____

    b. How do you know? _____

    _____

    _____

    c. What is the total cost of the cider? Use equivalent fractions.

    The cider costs $_____.

Extra Practice: Multiplying Decimals

Part 1: Circle expressions that have a product less than both factors.

1. 0.9×0.45 **2.** 8.0×0.1 **3.** 0.40×0.6

4. 0.3×0.03 **5.** 0.58×0.7 **6.** 0.2×3

7. 0.6×2.0 **8.** 0.19×0.4 **9.** 5.0×0.01

Part 2: Match each multiplication expression to the equivalent fraction expression.

0.2×0.94	$\dfrac{8}{100} \times \dfrac{1}{10}$
0.70×0.4	$\dfrac{18}{100} \times \dfrac{1}{10}$
0.6×0.53	$\dfrac{49}{100} \times \dfrac{2}{10}$
0.34×0.8	$\dfrac{2}{10} \times \dfrac{94}{100}$
0.18×0.1	$\dfrac{3}{10} \times \dfrac{40}{100}$
0.3×0.40	$\dfrac{34}{100} \times \dfrac{8}{10}$
0.50×0.8	$\dfrac{70}{100} \times \dfrac{4}{10}$
0.49×0.2	$\dfrac{6}{10} \times \dfrac{53}{100}$
0.08×0.1	$\dfrac{50}{100} \times \dfrac{8}{10}$

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Penny for Your Thoughts

Part 1: Use number strings to solve.

Equation	Number String
1. $0.4 \times 0.67 =$ _____	$4 \times 67 = 268$ _____ _____ _____
2. $2.9 \times 0.03 =$ _____	_____ _____ _____ _____
3. $0.81 \times 6 =$ _____	_____ _____ _____

Part 2: Use the standard multiplication algorithm to solve.

4. Ruth takes bags of pennies to a coin shop. Each bag contains 0.6 of a gram of copper. How many grams of copper are in 2 bags of pennies?

$0.6 \times 2 =$ _____

There are _____ grams of copper in 2 bags of the pennies.

5. Abeo collects pennies from his birth year. His collection contains 0.31 of a gram of copper. How many grams of copper are in 0.8 of Abeo's collection?

$0.31 \times 0.8 =$ _____

There is _____ of a gram of copper in 0.8 of Abeo's collection.

Multiplying with Decimals

Review the example problem. Then use the algorithm for multiplying with decimal numbers to solve. Show your work. Use reasoning about place value to position the decimal point in the solution.

Example

Multiply **0.25** × **0.2**. Show your work.

Step 1	Step 2	Step 3	Step 4
Use the multiplication algorithm to multiply the digits in the problem, ignoring the decimal point for now.	Use reasoning to think about the placement of the decimal point in the product.	Think about the rule for inserting a decimal point in a product.	Insert the decimal point.
$$\begin{array}{r} 1 \\ 025 \\ \times\ \ 02 \\ \hline 050 \\ +\ \ 000 \\ \hline 0050 \end{array}$$	The product has to be less than **0.2** because both factors are less than 1. 50, 5, and 0.50 are greater than **0.2**.	There are three decimal place values in the factors **0.25** and **0.2**. There should be three decimal places in the product (though the last one is 0).	The product must be 0.050 = 0.05 **0.25** × **0.2** = 0.05

1. 0.75 × 0.2 = _____

2. 0.71 × 0.5 = _____

3. 1.4 × 0.3 = _____

4. 1.33 × 3 = _____

5. 2.42 × 2.2 = _____

6. 0.32 × 4 = _____

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Lesson 38 Exit Ticket

Part 1: Use number strings to solve.

Equation	Number String
1. $3 \times 0.57 =$ _____	_____ _____ _____
2. $0.44 \times 0.2 =$ _____	_____ _____ _____ _____

Part 2: Use the standard algorithm to solve. Show your work.

3. The diameter of a circle is the straight-line distance from one side, through the middle, to the other side. The radius is 0.5 of the diameter. The diameter of a nickel is about 0.84 of an inch. What is the radius of a nickel?

$0.84 \times 0.5 =$ _____

The radius of a nickel is _____ of an inch.

4. Multiply.

$0.44 \times 6 =$ _____

Extra Practice:
True and False and Match

Part 1: For each equation, write *true* or *false*. If the equation is false, write a number string to find the correct product.

1. 0.74 × 0.5 = 0.37 _____

2. 0.28 × 0.3 = 0.84 _____

3. 4 × 0.86 = 3.44 _____

Part 2: Match each multiplication expression to the correct product.

0.3 × 0.83   0.032

4 × 0.35   1.4

0.16 × 0.2   0.238

0.34 × 0.7   0.249

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Number Triangles

21 ÷ ÷
7 × [ ]

[ ] ÷ ÷
6 × 4

18 ÷ ÷
[ ] × 3

121 ÷ ÷
11 × [ ]

[ ] ÷ ÷
9 × 5

72 ÷ ÷
9 × [ ]

Decimal Place Value Charts (Thousandths)

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Decimal Place Value Charts (Thousandths)

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Hundreds	Tens	Ones		Tenths	Hundredths	Thousandths
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Decimal Place Value Charts (Thousandths)

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All-Star Talent Show

Part 1: Model each expression with **base-10 blocks**. Write the quotient to complete the equation.

1. 0.56 ÷ 8 = _____

2. 7 ÷ 0.25 = _____

3. 3 ÷ 0.6 = _____

4. 7.02 ÷ 3 = _____

5. 8.64 ÷ 4 = _____

6. 2 ÷ 0.5 = _____

Part 2: Read the problem. Model with **base-10 blocks** and answer the questions.

7. The parents of the fifth graders at school decide to make bags of jelly beans to sell at the talent show. They have 6 pounds of jelly beans. They want to put 0.2 of a pound in each bag.

a. What expression models the number of bags they can make from 6 pounds of jelly beans? _____

b. How many bags can the parents make from 6 pounds of jelly beans?

_____

8. At the talent show, the parents sell each bag of jelly beans for $0.75. If 5 students want to share a bag of jelly beans equally, how much should each student pay?

a. What expression models the amount of money each student should pay?

_____

b. How much should each student pay? $_____

Stars of the Show

Read each problem and write an expression for the division problem.
Use **base-10 blocks** to model and solve it. Fill in the blanks to answer questions.

1. Belinda does magic tricks for her part in the talent show. In one trick, she pours 0.24 of a gallon of water into 3 hats. Each hat holds the same amount of water. How many gallons of water does Belinda pour into each hat?

Expression: _____

Belinda pours _____ of a gallon of water into each hat.

2. Kai and Yvette do a hip-hop dance routine in the talent show. During a 1.58-minute section of their music, the dancers do 2 solos. If the solos are the same length, how long is each dancer's solo?

Expression: _____   Each solo is _____ of a minute long.

3. Layne does jump-rope tricks in the talent show. Layne's act is 4 minutes long, and each trick takes 0.8 of a minute. How many tricks does Layne do?

Expression: _____   Layne does _____ tricks.

Marisol does a dance with several long ribbons for her act in the talent show. She uses 6 yards of silk to make the ribbons. If each ribbon is 0.5 of a yard long, how many ribbons does Marisol use in her dance?

Expression: _____   Marisol uses _____ ribbons.

4. Dinh recites 4 poems that he wrote for his act in the talent show. He takes 8.64 minutes to recite the poems, and each poem is the same length. How long does Dinh take to recite each poem?

Expression: _____

Dinh takes _____ minutes to recite each poem.

Lesson 39 Exit Ticket

Part 1: Use **base-10 blocks** to solve. Complete the equations.

1. Tim discovers that a 1.44-quart jar takes 4 full scoops of beans to fill. How many quarts of beans does the scoop hold?

   1.44 ÷ 4 = _____

   The scoop holds _____ of a quart of beans.

2. Sharla has 4 pounds of clay. How many clay pots can she make if each pot takes 0.8 pounds of clay to make?

   4 ÷ 0.8 = _____

   Sharla can make _____ pots.

Part 2: Model each expression with **base-10 blocks**. Then write the quotient to complete the equation.

3. 6.14 ÷ 2 = _____

4. 3 ÷ 0.25 = _____

Extra Practice: Dividing with Decimals

Part 1: Read each problem and write an expression to represent the division. Use **base-10 blocks** to model and solve.

1. Mariana spends $6.30 on popsicles for herself and 4 friends. What is the cost of each popsicle?

Expression: _____

Each popsicle costs $_____.

2. Aasif makes 6 quarts of iced tea. How many 0.5-quart glasses can he fill?

Expression: _____

Aasif can fill _____ glasses.

Part 2: Model each expression with **base-10 blocks**. Then, write the quotient to complete the equation.

3. $5 \div 0.25 =$ _____

4. $0.7 \div 10 =$ _____

5. $0.48 \div 6 =$ _____

6. $9 \div 0.5 =$ _____

7. $0.68 \div 4 =$ _____

8. $8 \div 0.32 =$ _____

9. $3 \div 1.5 =$ _____

10. $1.75 \div 5 =$ _____

Hidden Treasures

Part 1: Use **hundred grids** to model each problem. Write a division equation and fill in the blanks to answer each question.

1. Veronica has $4 to spend at her favorite thrift store. She sees a sign that says "Books: $0.50 each." How many books can Veronica buy?

Equation: _____   Veronica can buy _____ books.

2. Ricky wants to paint some chairs. He knows it takes 0.6 of a quart of paint to paint 1 chair. He finds 3 quarts of green paint at a garage sale. How many chairs can Ricky paint with 3 quarts of paint?

Equation: _____   Ricky can paint _____ chairs.

Part 2: Complete a **tape diagram** to model each problem. Write a division equation and fill in the blanks to answer each question.

3. Sanjay discovers 3 record albums in a dusty bin marked "Super Sale" at the back of an old music store. Each album is the same price, and the total is $0.72. How much does each album cost?

Equation: _____   Each album costs $ _____.

4. Aera wants to buy 5 used t-shirts with her favorite band's name on them. Each shirt is the same price and, together, the shirts cost $12.25. What is the price of each shirt?

Equation: _____   Each shirt costs $_____.

Hardware Store

Review the example problem. Then read each problem. Use **hundred grids** to model division. Answer the questions.

Example

A hardware store sells nails for $**0.08** each. How many nails can a customer get for $**2**?

Step 1

Write an expression to model the problem.

How many groups of **0.08** are in **2**?

2 ÷ 0.08

Step 2

Model the dividend with hundred grids.

It takes **2** hundred grids to represent **2** wholes.

Step 3

Color as many groups as you can that are the size of the divisor.

The divisor is **0.08**, which is 8 hundredths. Each group is 8 squares.
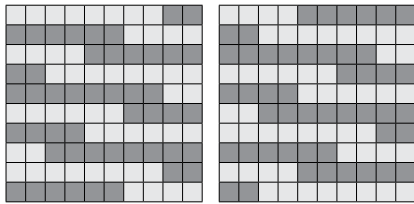
Step 4

Count the number of equal groups in the solution.

There are 25 groups of 8 squares each: **2 ÷ 0.08** = 25

The customer can get 25 nails.

1. The hardware store sells bolts for $0.50 each.

   a. What expression models the number of bolts a customer could get for $3?

   _____

   b. How many bolts can a customer get for $3? _____

2. Chain costs $0.16 per foot.

   a. What expression models the number of feet of chain a customer can buy for $4?

   _____

   b. How many feet of chain can a customer buy for $4? _____

3. Richard spends $3 on metal hangers. Each hanger costs $0.25.

   a. What expression models the number of hangers Richard buys? _____

   b. How many hangers does Richard buy? _____

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Lesson 40 Exit Ticket

Part 1: Use hundred grids to solve the problem.

1. Paschka has $4 to spend at the bakery. Muffins cost $0.80 each. How many muffins can Paschka buy?
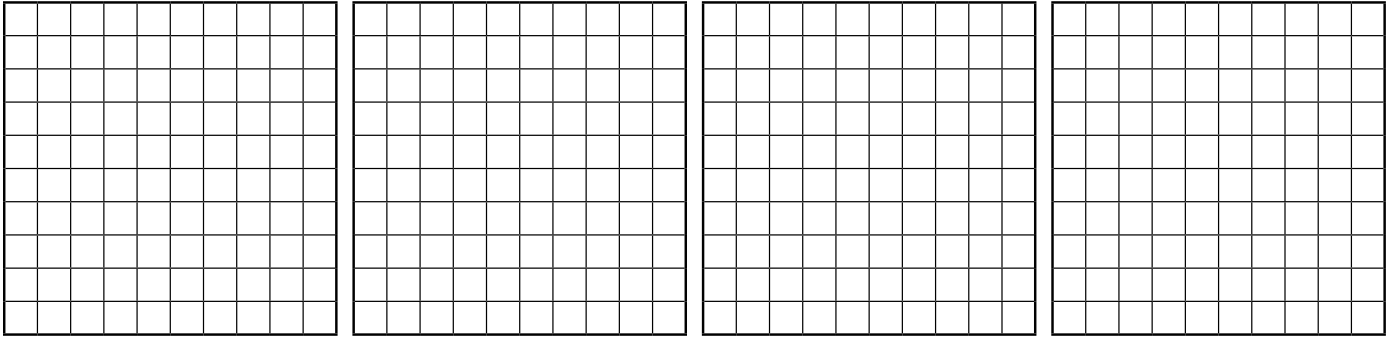
Equation: _____   Paschka can buy _____ muffins.

Part 2: Use **tape diagrams** to solve the problems.

2. Rachel spends $10.60 on 4 airplane models. Each model is the same price. How much does each model cost?

Equation: _____   Each model costs $_____.

3. Anastasia buys 6 comic books for $12.54. If each comic book is the same price, what is the price of 1 comic book?

Equation: _____   Each comic book costs $_____.

Extra Practice: Division with Decimals

Decide whether to use **hundred grids** or **tape diagrams** to solve. Write an equation to represent the division.

1. Liam makes pillows for his room. He has 3 yards of fabric. It takes 0.75 of a yard of fabric to make one pillow. How many pillows can Liam make?

Which model is best for this problem? _____

Equation: _____   Liam can make _____ pillows.

2. Kenji spent $3.45 on 3 items at the store. Each item cost the same. How much did each item cost?

Which model is best for this problem? _____

Equation: _____   Each item cost _____.

3. Drew's bike ride was 9.42 kilometers long, including the part going out and the part coming back. Each of the 2 parts were the same length. How long was each part of the ride?

Which model is best for this problem? _____

Equation: _____   Each part of the ride was _____ km.

4. Taya runs a 2-mile race with 0.4-mile sections. How many sections are there?

Which model is best for this problem? _____

Equation: _____   There are _____ race sections.

Number Triangles
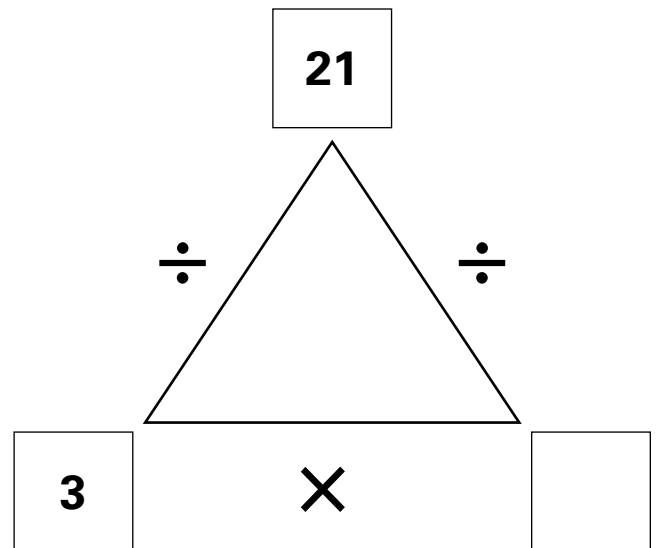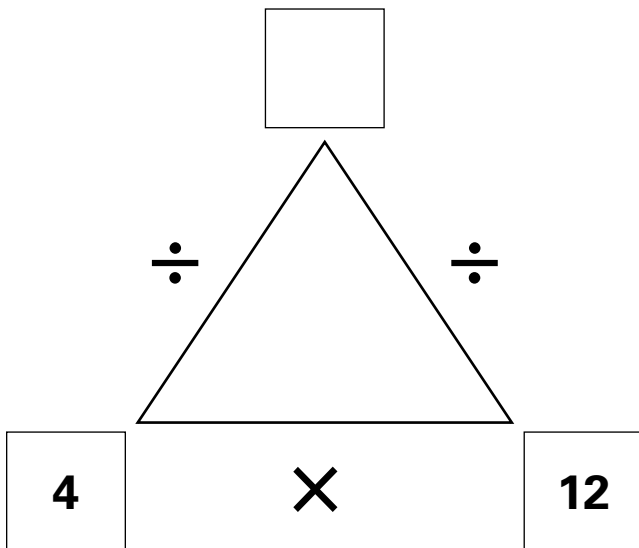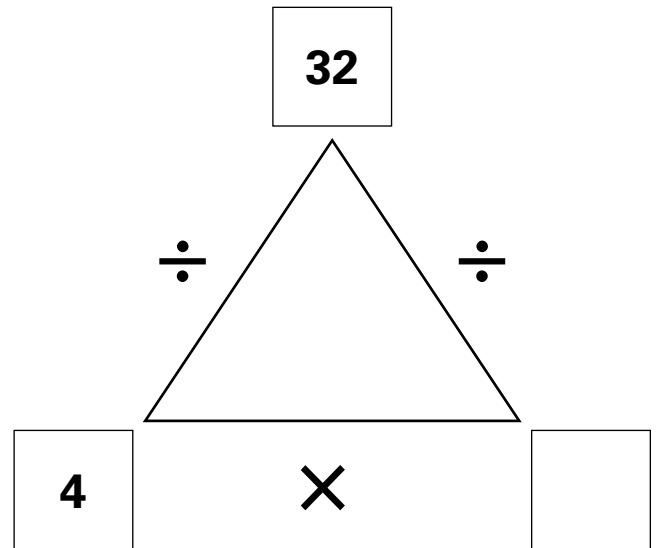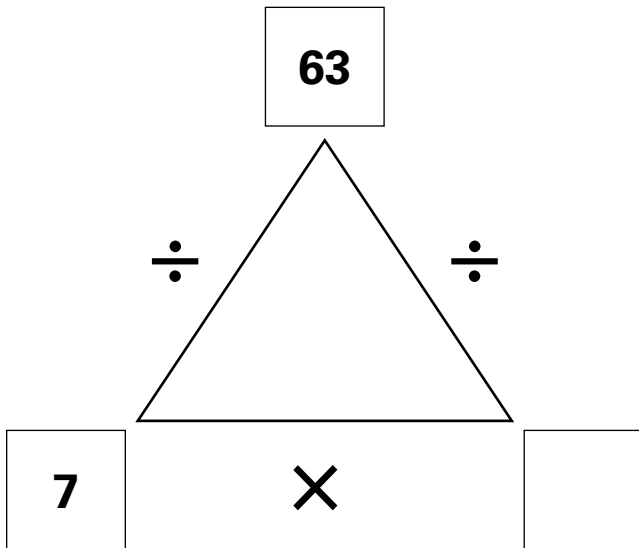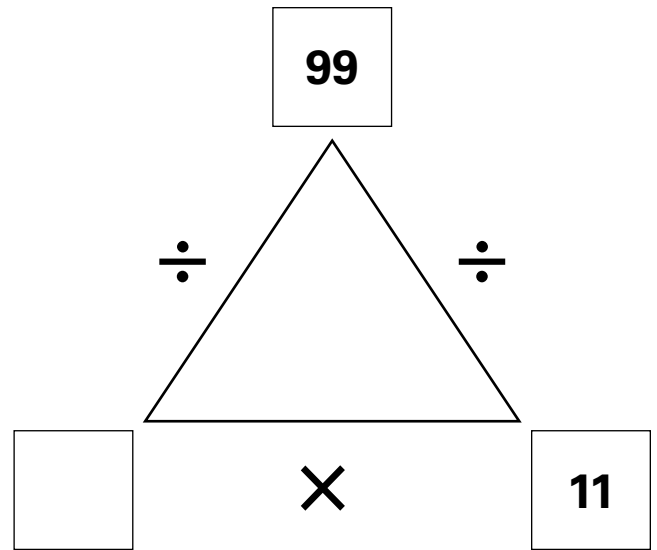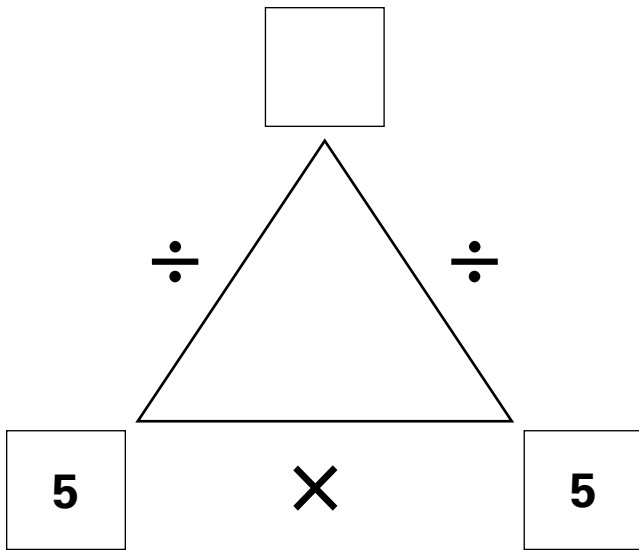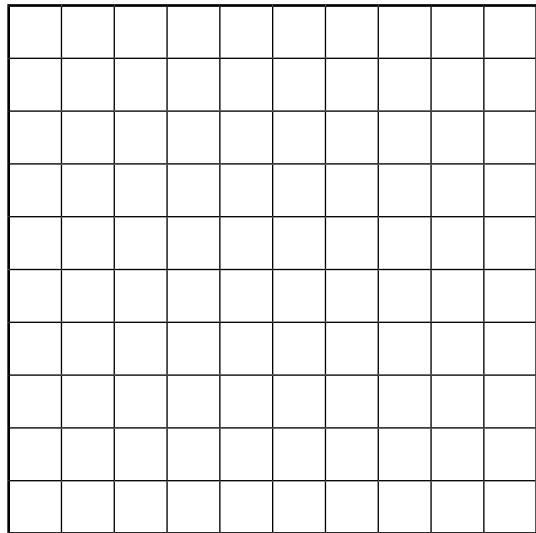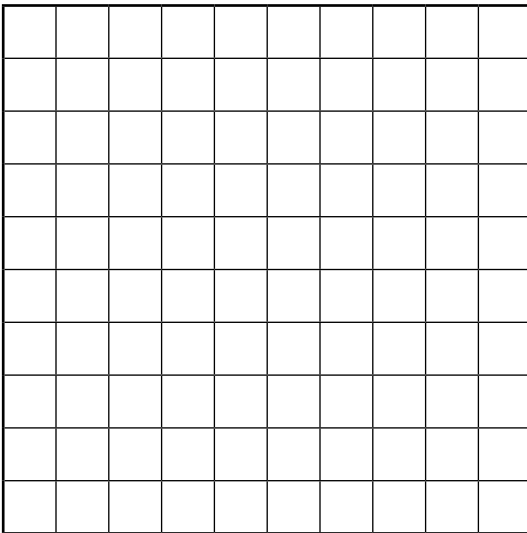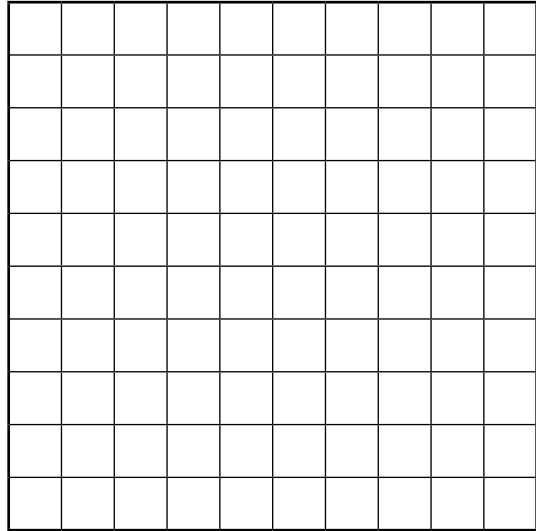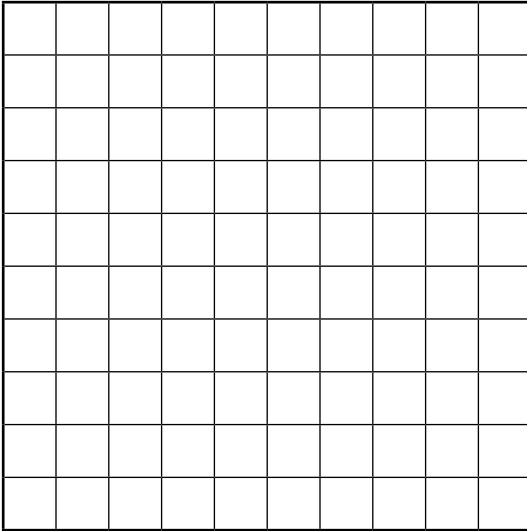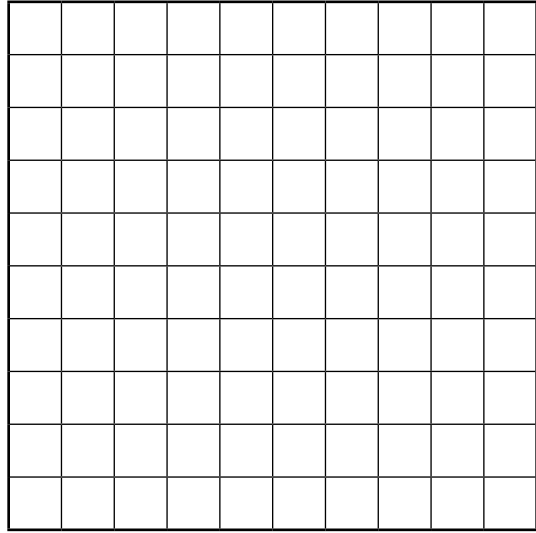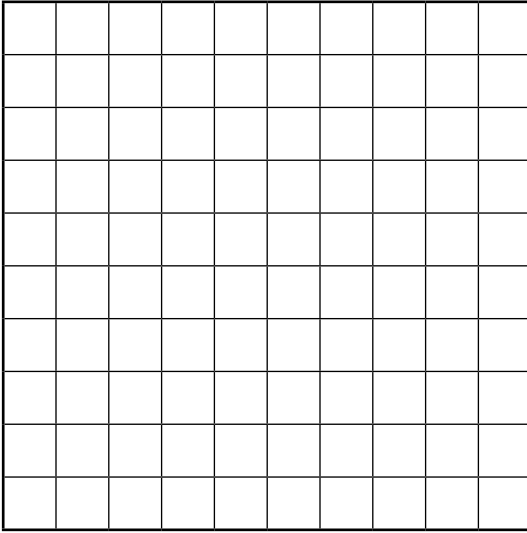
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Hundred Grids

Hundred Grids

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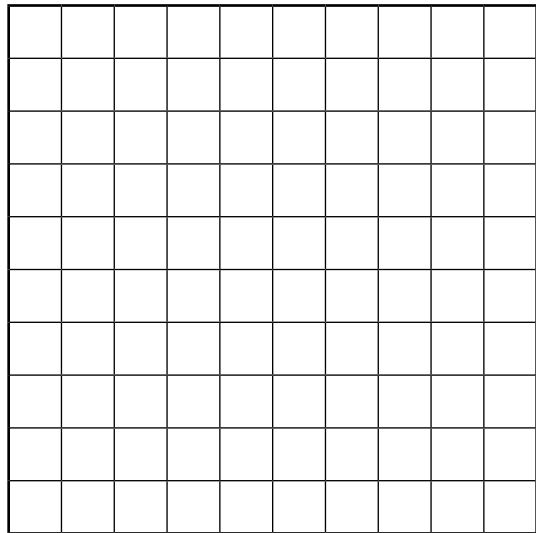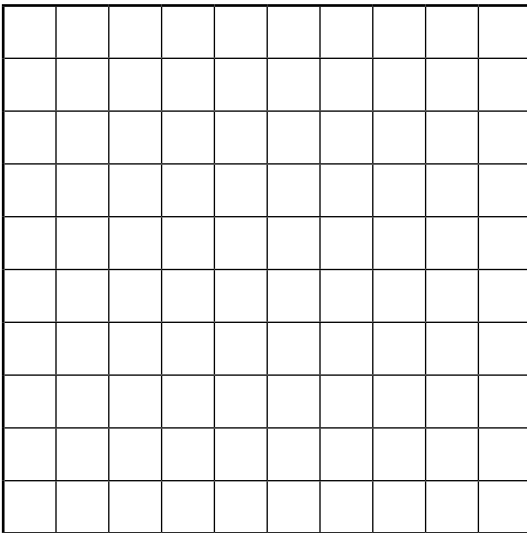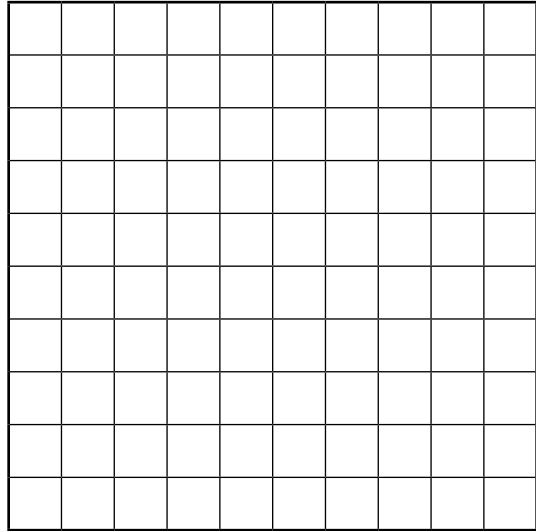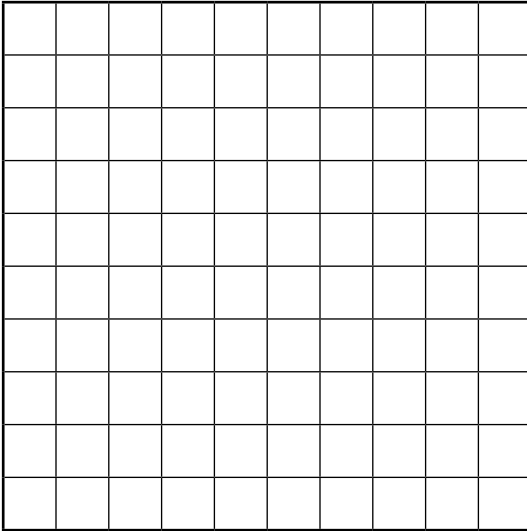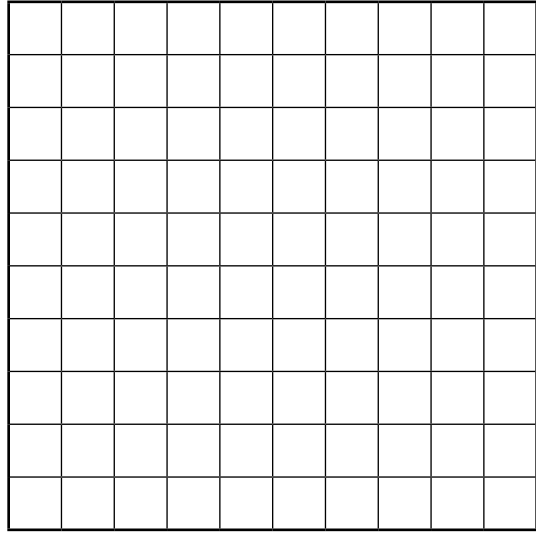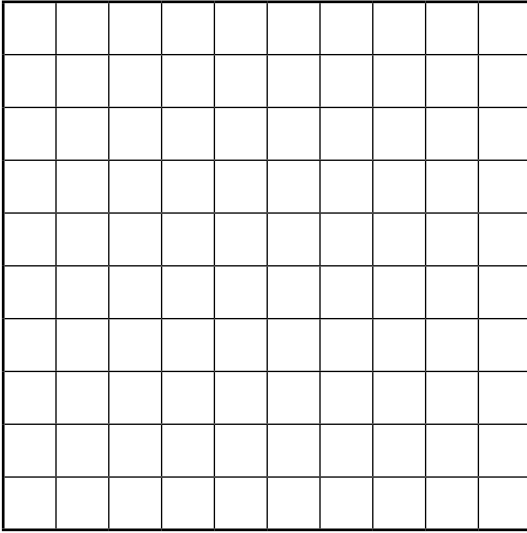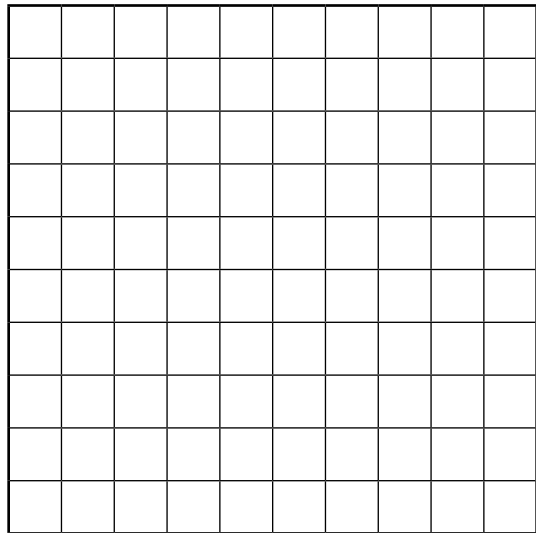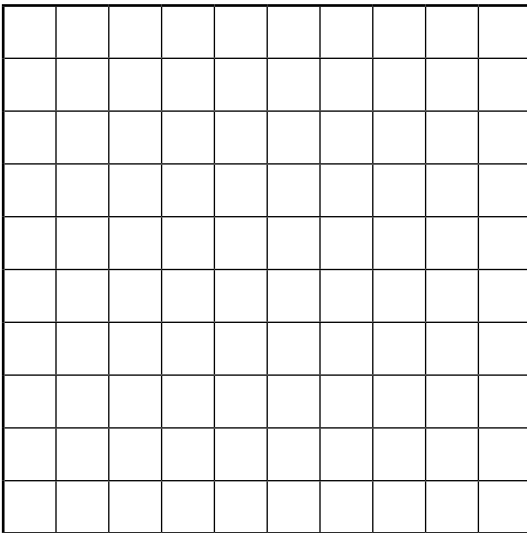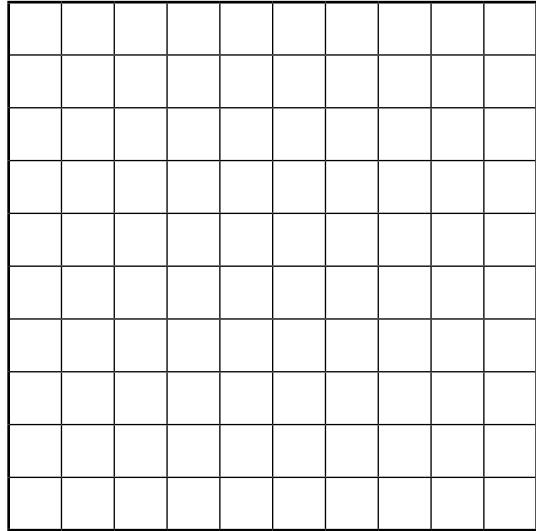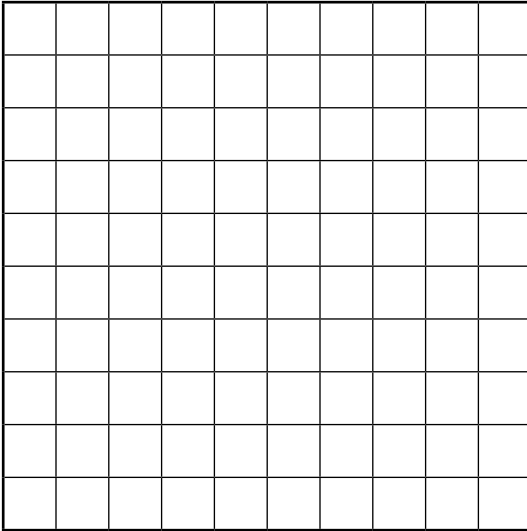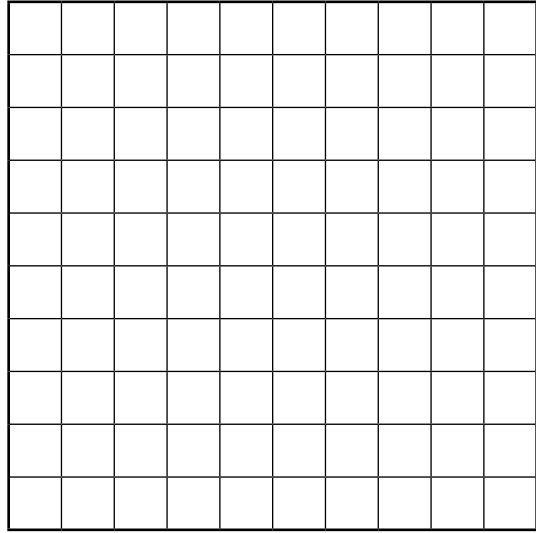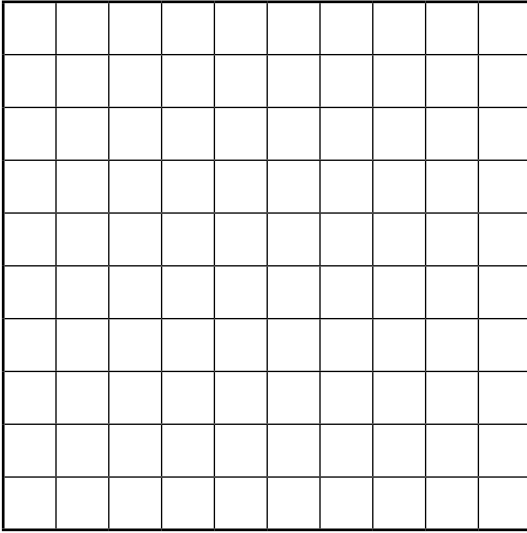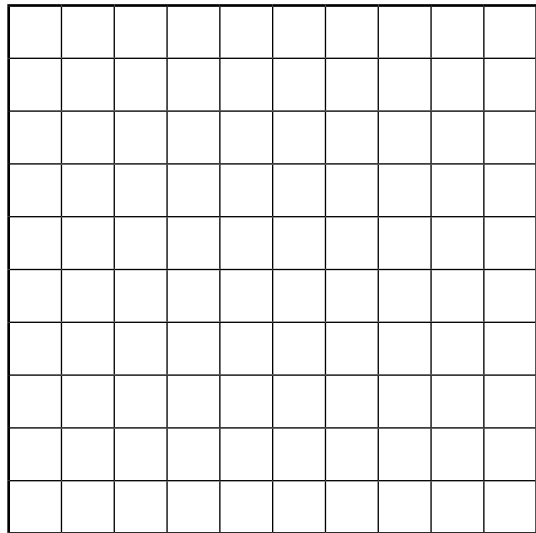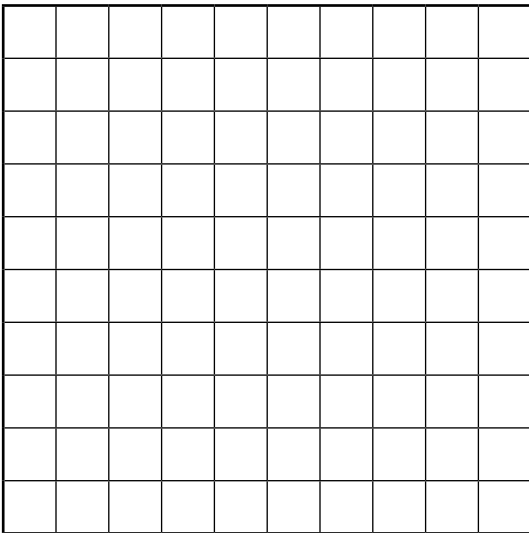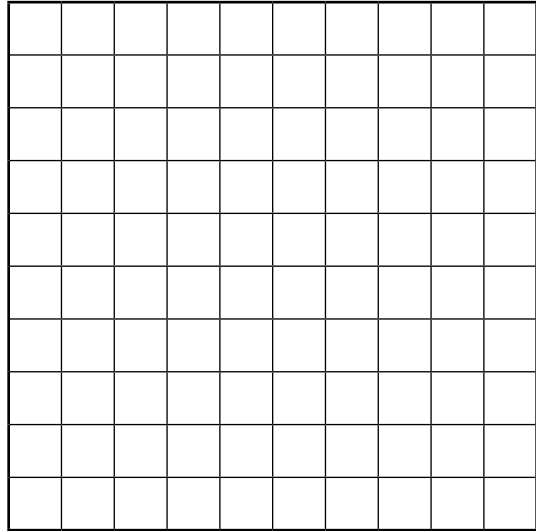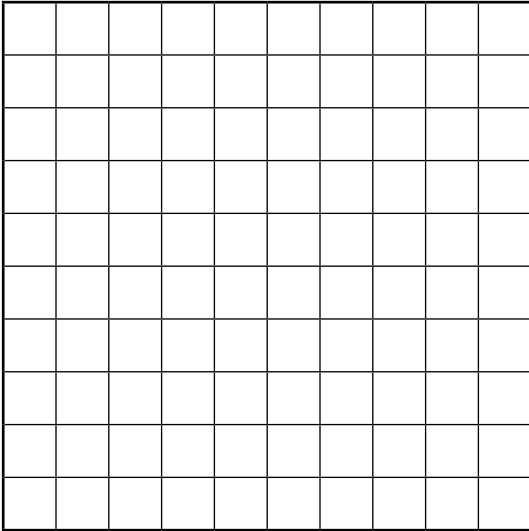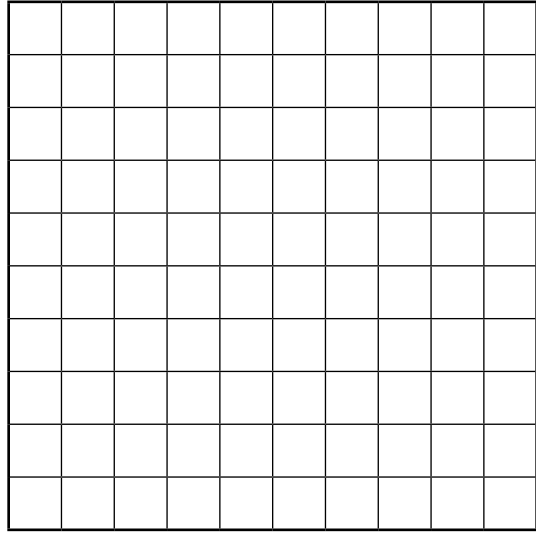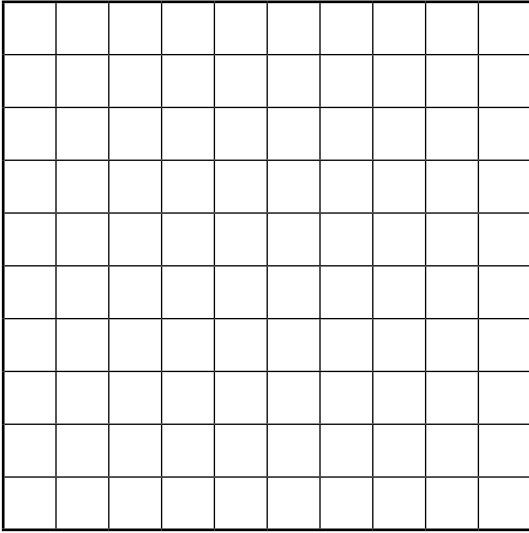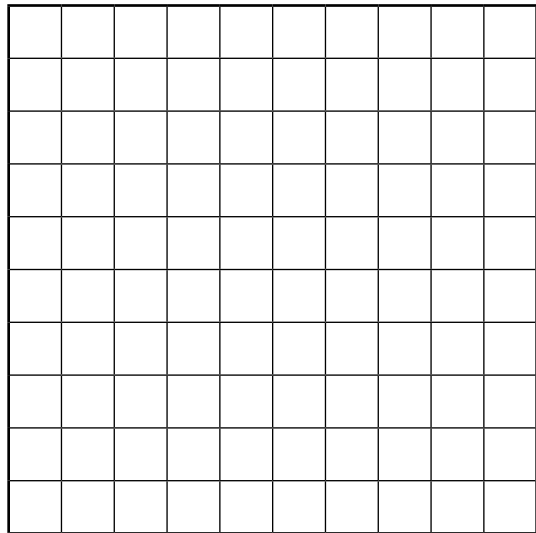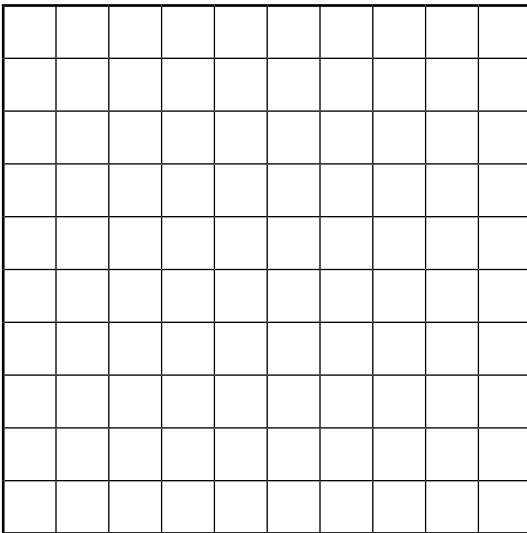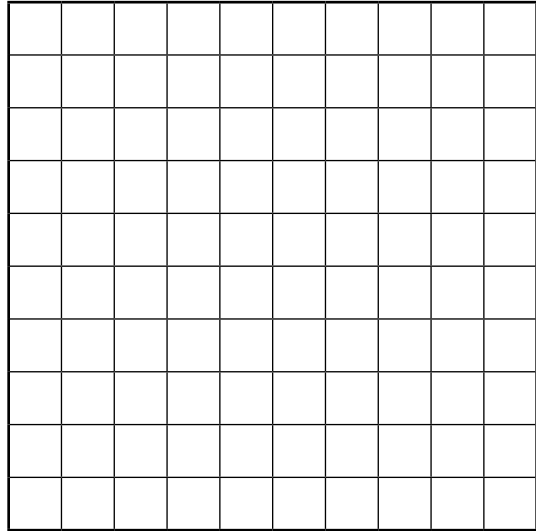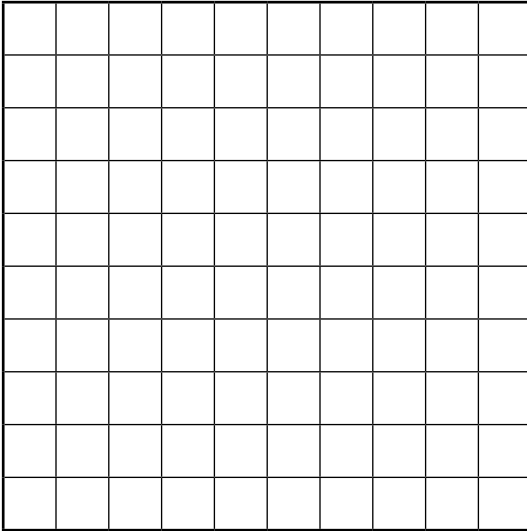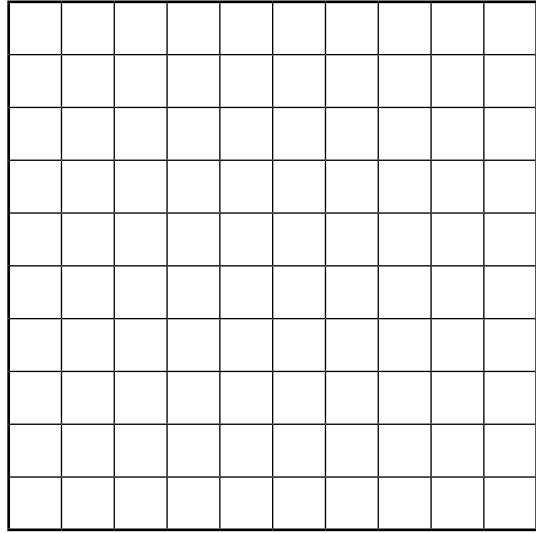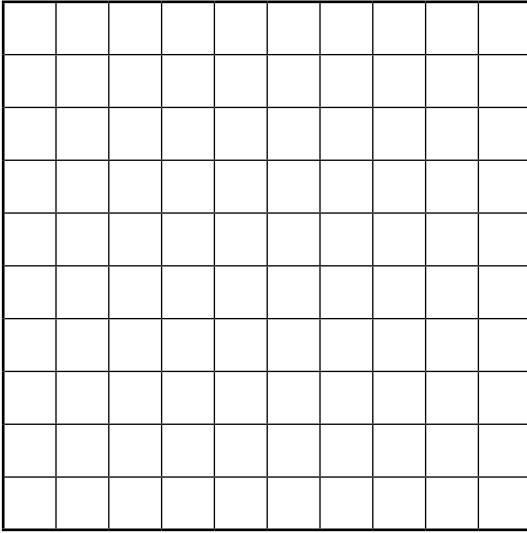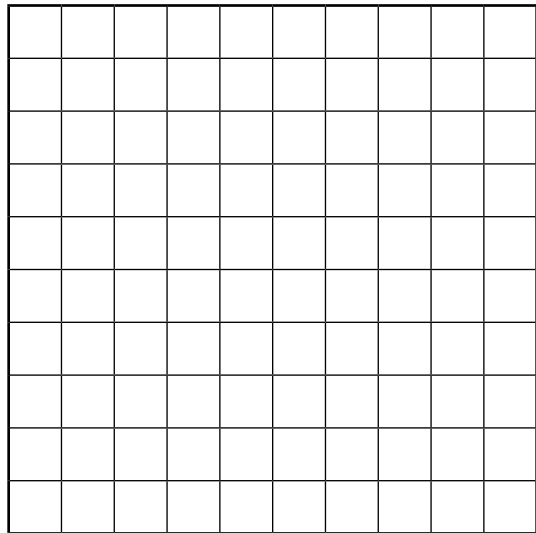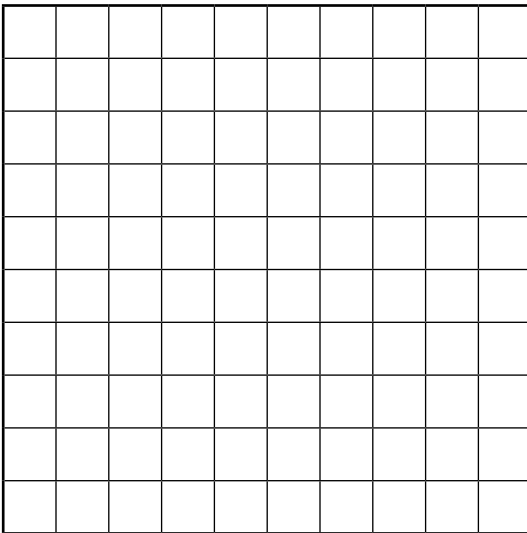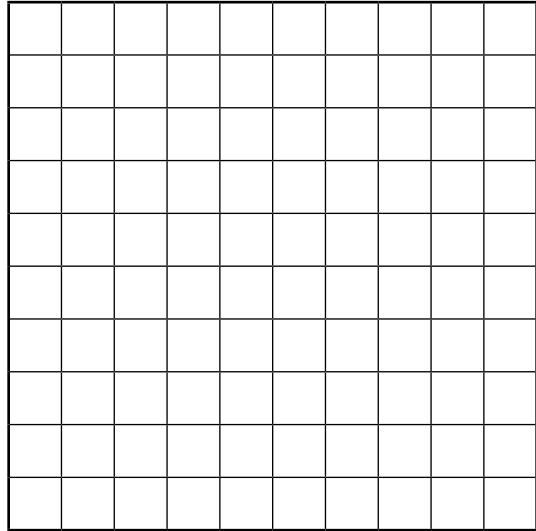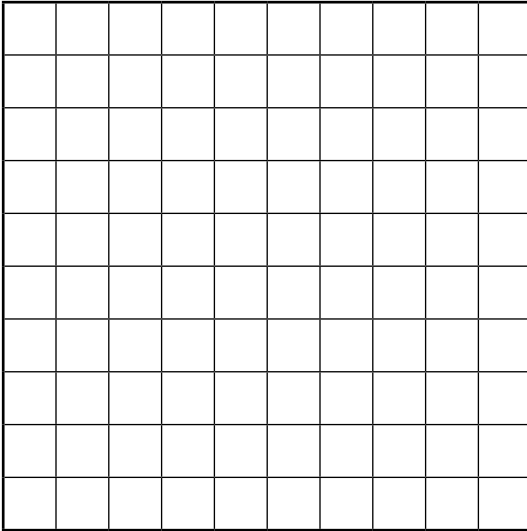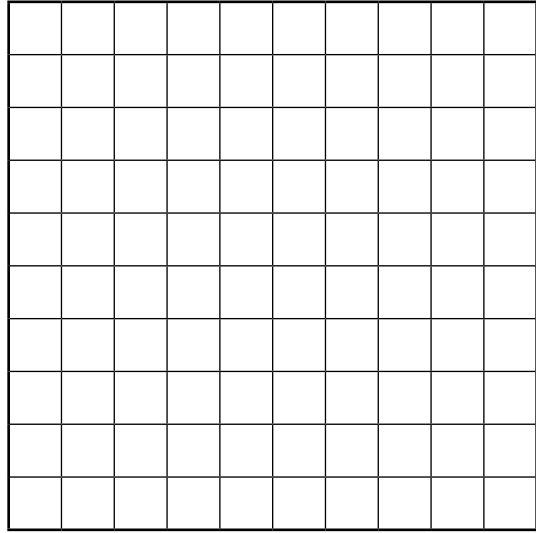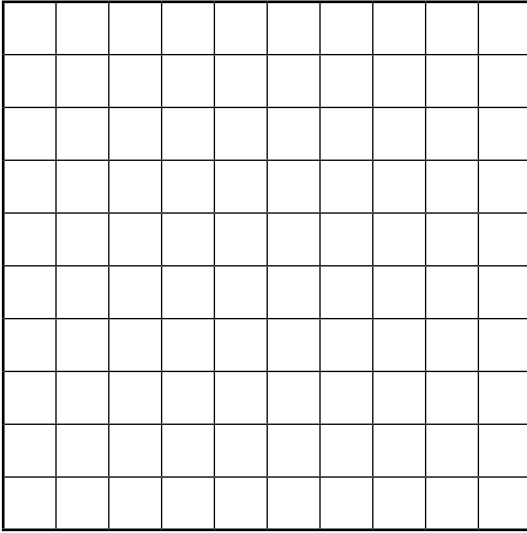
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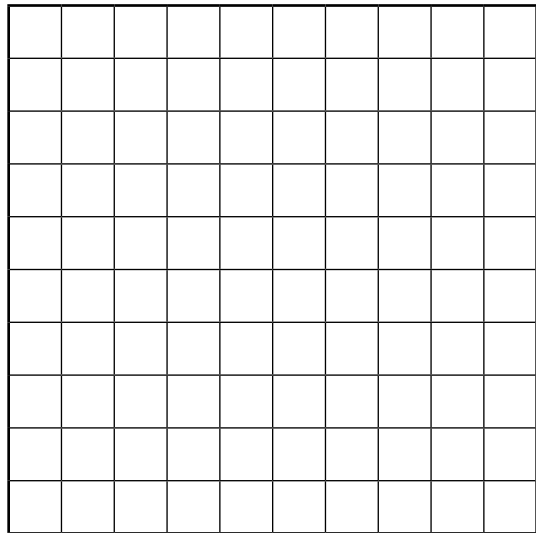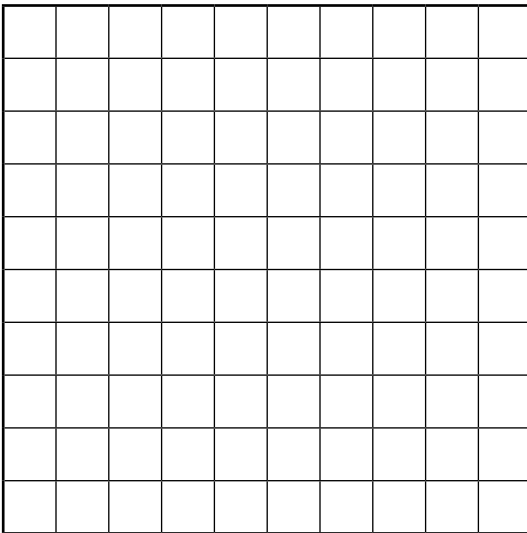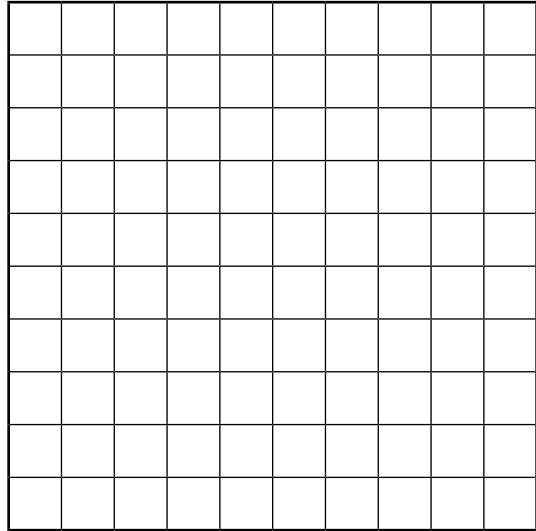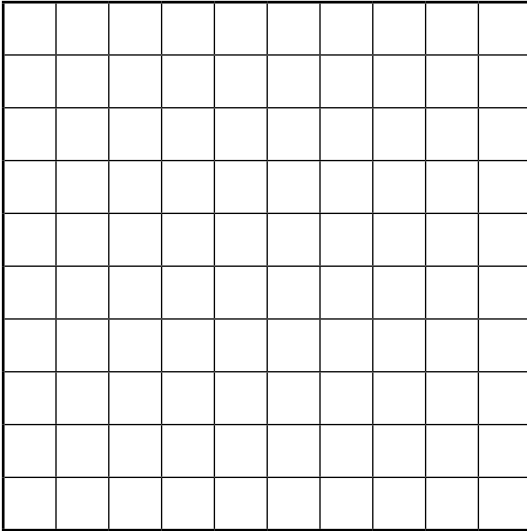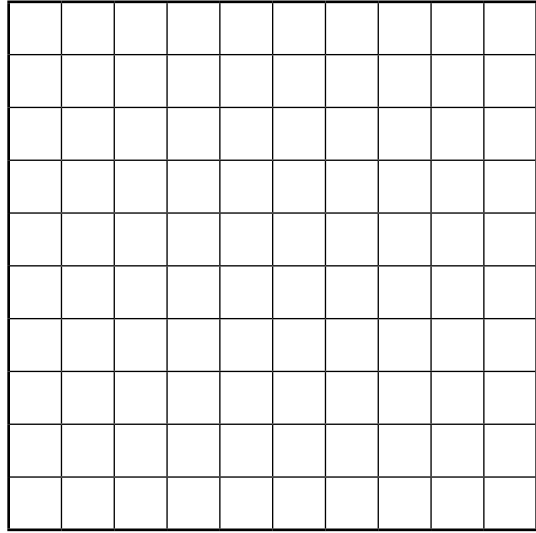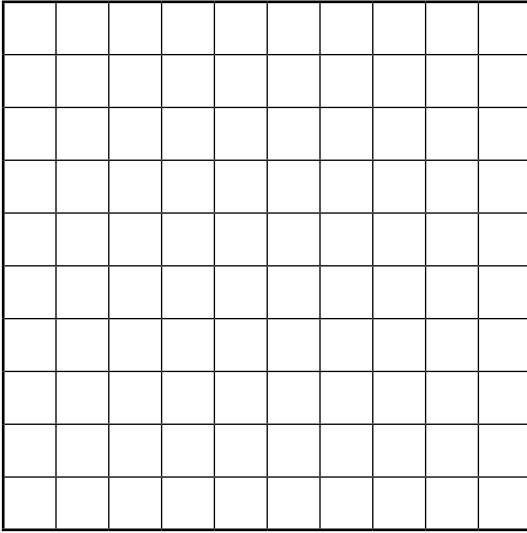
Hundred Grids

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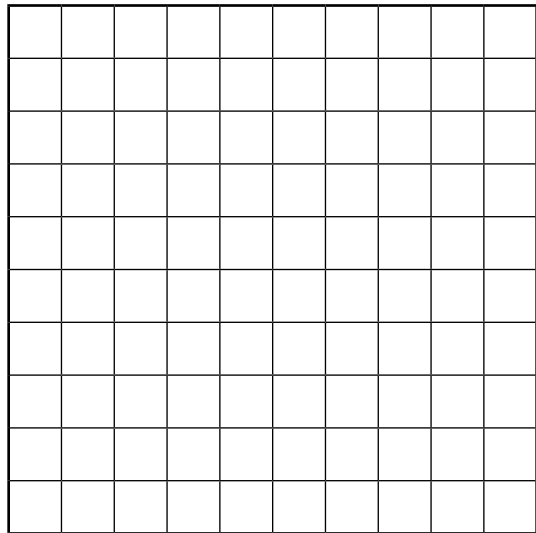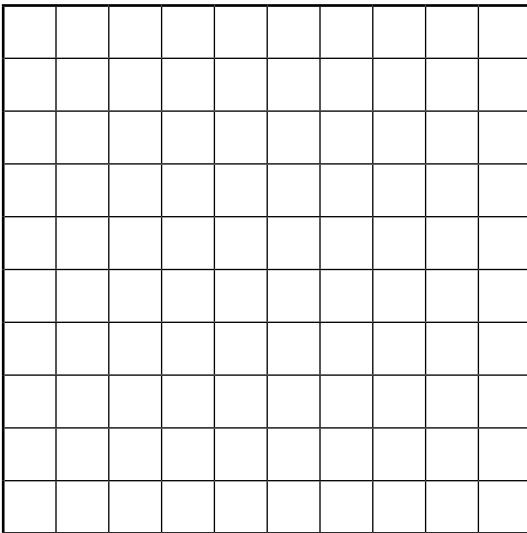
Comic Conventions

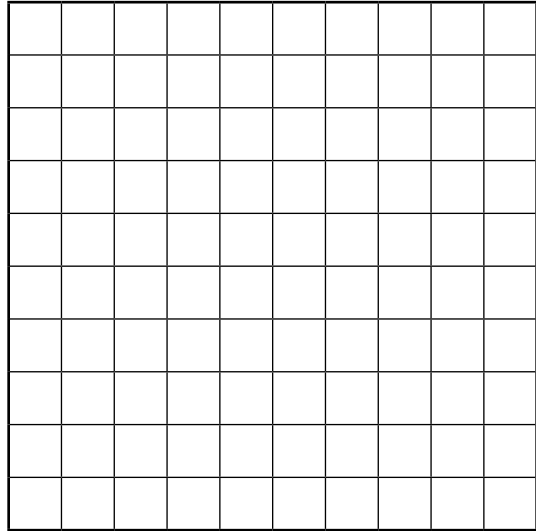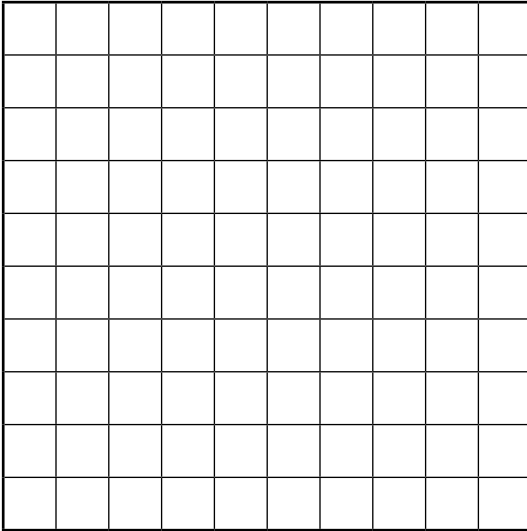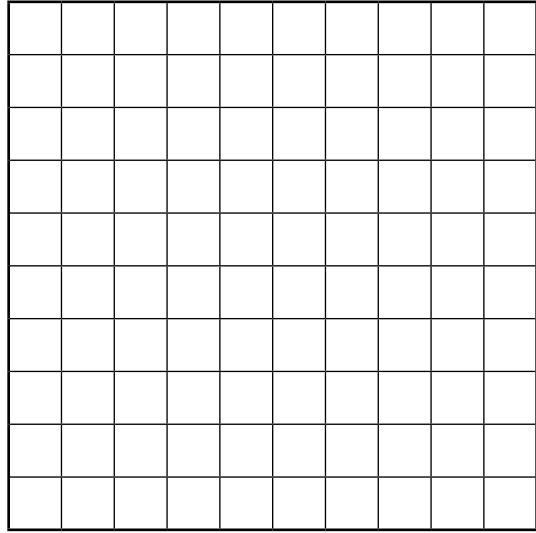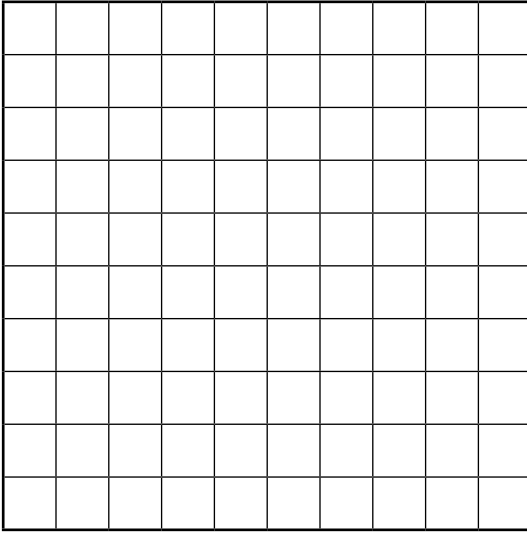**Part 1:** Use rounding and the standard algorithm to divide and answer the questions.

1. Maria will attend the Mystical Creatures Convention for 15.75 hours. Each panel discussion is 1.5 hours long. How many panel discussions can Maria attend?

   a. What expression represents the problem? _____

   b. What is the rounded dividend? _____

   c. What is the rounded divisor? _____

   d. What is the estimated solution? _____

   e. Divide using the standard algorithm.
   How many panels can Maria attend? _____

Part 2: Round the dividend and divisor to estimate the quotient. Use the standard algorithm to divide.

2. $2.64 \div 0.8 =$ _____

   a. 2.64 is about _____,
   and 0.8 is about _____.

   b. I estimate the quotient is
   about _____.

3. $16.8 \div 0.7 =$ _____

   a. 16.8 is about _____,
   and 0.7 is about _____.

   b. I estimate the quotient is
   about _____.

Delicious Deli

Review the example problem. Then solve each problem using rounding and the standard algorithm.

Example

When Mac's Deli opens on Monday morning, it has **51.2** pounds of corned beef. How many party trays can the deli make if each tray contains **3.2** pounds of corned beef?

Step 1

Write an expression to model the problem.

How many groups of **3.2** are in **51.2**?

51.2 ÷ 3.2

Step 2

Round the dividend and divisor to the nearest whole number and use these to estimate a quotient.

51.2 rounds to 51.

3.2 rounds to 3.

51 ÷ 3 = 17

Step 3

Use the standard algorithm to divide the original terms without the decimal point.

```
        16
  32 ) 512
     − 32
       192
     − 192
         0
```

Without a decimal point, the quotient is 16.

Step 4

Use the estimate and reasoning about place value to determine where to place the decimal point.

The estimate, 17, has its highest value in the tens place.

The quotient could be 0.16, 1.6, 16, or other options, but 16 shares the estimate's highest place value.

The deli can make 16 trays.

1. 12.1 ÷ 1.1 = _____

2. 17.92 ÷ 5.6 = _____

3. 54.5 ÷ 2.5 = _____

Catapult Learning™

Lesson 41 Exit Ticket

Use rounding and the standard algorithm to divide.

1. 86.1 ÷ 2.1 = _____

   a. What is the rounded dividend? _____

   b. What is the rounded divisor? _____

   c. What is the estimated solution? _____

2. 1.92 ÷ 0.8 = _____

   a. What is the rounded dividend? _____

   b. What is the rounded divisor? _____

   c. What is the estimated solution? _____

3. 9.12 ÷ 2.4 = _____

   a. What is the rounded dividend? _____

   b. What is the rounded divisor? _____

   c. What is the estimated solution? _____

Extra Practice: Dividing Two Decimals

Part 1: Circle the correct choice for the form of the expression with the dividend and divisor rounded to the nearest whole number.

1. $14.25 \div 1.5$ Rounded form: $14 \div 1$ OR $14 \div 2$

2. $18.46 \div 2.6$ Rounded form: $18 \div 3$ OR $19 \div 3$

3. $13.25 \div 5.39$ Rounded form: $13 \div 5$ OR $13 \div 6$

Part 2: Use rounding and long division to divide.

4. $13.2 \div 1.2 = $ _____

    a. Rounded dividend: $13.2 = $ _____

    b. Rounded divisor: $1.2 = $ _____

    c. Estimate: _____

5. $8.25 \div 0.75 = $ _____

    a. Rounded dividend: $8.25 = $ _____

    b. Rounded divisor: $0.75 = $ _____

    c. Estimate: _____

Nature in a Jar

Write the expression and estimate the solution. Then use the standard algorithm to multiply or divide.

1. Last year, the Natural World Club earned 0.9 of its $140 budget from the Nature in a Jar sale. How much of the budget was from the sale?

Expression: _____

How can you use compatible numbers to estimate?

_____

_____

The club earned _____ dollars from the sale.

2. Naomi brings in a 4-pound bag of soil for club members to use to make terrariums for this year's sale. They put 0.4 pound of soil in each jar. How many terrariums can they make?

Expression: _____

How can you use compatible numbers to estimate?

_____

_____

They can make _____ terrariums.

3. The club spends $17.10 on the supplies to make 18 terrariums. How much will each terrarium cost to make?

Expression: _____

How can you use compatible numbers to estimate?

_____

_____

Each terrarium will cost $_____ to make.

Rings and Things

Review the example problem. Then read each problem and use the standard algorithms to solve.

Example

Oscar designs, makes, and sells jewelry. He uses silver to make his most popular ring design.

Step 1

Oscar makes **14** rings with **2.36** ounces of silver each. How much total silver will he need?

Write an expression.

If you know the number of groups and the size of the groups, **multiply**.

2.36 × **14**

Step 2

Use the standard algorithm to solve.

$$
\begin{array}{r}
1\,2 \\
\mathbf{2.3\,6} \\
\times \quad \mathbf{1\,4} \\
\hline
9\,4\,4 \\
2\,3\,6\,0 \\
\hline
3\,3\,0\,4
\end{array}
$$

Step 3

Count the combined number of places to the right of the decimal points in the factors.

There are 2 decimal places to the right of the decimal point in **2.36**, so there will be 2 decimal places to the right of the decimal point in the product.

2.36 × **14** = 33.04

Step 1

Oscar uses a total of **33.04** ounces of silver. Each ring is **2.36** ounces How many rings can he make?

Write an expression.

If you know the whole and the size or number of groups, **divide**.

33.04 ÷ **2.36**

Step 2

If necessary, multiply each number by the same power of 10 to make a whole number divisor. Write a new expression with the new numbers.

2.36 × 100 = 236   **33.04** × 100 = 3,340

33.04 ÷ **2.36** = 3,304 ÷ 236

Step 3

Divide using the long division algorithm.

$$
\begin{array}{r}
14 \\
236 \overline{)\,3304} \\
-\,236 \\
\hline
944 \\
-\,944 \\
\hline
0
\end{array}
$$

33.04 ÷ **2.36** = 14

---

1. Oscar's best-selling bracelet are 5.25 ounces of silver. How many bracelets can he make from 31.5 ounces of silver?

Expression: _____

He can make _____ bracelets.

2. Oscar makes 18 pairs of earrings. Each pair needs 0.75 ounces of silver. How much silver does he use?

Expression: _____

He uses _____ ounces of silver.

Lesson 42 Exit Ticket

Write an expression to model each problem and estimate the solution. Then use the standard algorithm to multiply or divide.

1. Kevin's science teacher gives each student in class 9.5 inches of copper wire to start an experiment. The teacher gives out a total of 152 inches of wire. How many students are in Kevin's science class?

Expression: _____

How can you use compatible numbers to estimate?

_____

_____

There are _____ students in Kevin's science class.

2. There are 500 students at Jordan Elementary School, and 0.24 of the 500 students are new. How many new students are there at Jordan Elementary School?

Expression: _____

How can you use compatible numbers to estimate?

_____

_____

There are _____ new students.

3. Kyra uses 0.8 ounces of glue to put together a model airplane. How many of the same model could Kyra put together with 4 ounces of glue?

Expression: _____

How can you use compatible numbers to estimate?

_____

_____

Kyra can make _____ of the same model.

Extra Practice: Multiplying and Dividing Decimals

Read each problem. Then write an expression to model the problem, estimate the solution, and solve. Show your work.

1. In a jar of 25 mixed olives, 0.4 of the olives are black olives. How many black olives are in the jar?

   Expression: _____

   Estimate: _____

   Solution: _____

2. How many loads of laundry can be washed with 5.6 ounces of detergent if each load takes 0.8 ounces of detergent?

   Expression: _____

   Estimate: _____

   Solution: _____

3. Five friends spend $31.25 on lunch. If they split the cost equally, how much does each friend owe?

   Expression: _____

   Estimate: _____

   Solution: _____

4. Eitan earns $9.50 for each hour that he babysits his nephew. How much money does Eitan earn for babysitting his nephew for 2.5 hours?

   Expression: _____

   Estimate: _____

   Solution: _____

Assessment

Unit 6 Assessment

1. Shoshona sells honey from her beehives for $0.70 per ounce. How much should Shoshona charge for 0.9 ounces of honey? Convert the decimals to fractions to multiply. Then convert the solution back into decimals and write the solution.

   a. Convert the decimals to fractions to multiply.

   b. As a decimal, how much should Shoshona charge for 0.9 ounces of honey?
   _____ dollars

2. Keisha plans to buy 0.7 gallons of apple cider. The cider costs $0.99 per gallon. Keisha predicts that the total cost will be less than $0.99.

   Is Keisha's prediction reasonable? _____

   Explain how you know.

   _____

   _____

3. Complete the number string to find the product.

   $0.46 \times 0.3 =$ _____

   $46 \times 3 = 138$

   _____ $\times$ _____ $=$ _____

   _____ $\times$ _____ $=$ _____

   _____ $\times$ _____ $=$ _____

4. Multiply using the standard algorithm. Show your work.

$0.58 \times 0.4 = $ _____

5. Divide using a tape diagram.

$11.25 \div 5 = $ _____

6. Divide using a tape diagram.

$4.2 \div 4 = $ _____

7. Use rounding to estimate. Then use the standard algorithm to solve. Show your work.

$7.98 \div 2.1 =$ _____

Estimate: _____

8. Round to estimate. Then use the standard algorithm to divide. Show your work.

$27.39 \div 3.3 =$ _____

Estimate: _____

Catapult Learning™

9. The choir director says that 0.75 of the 32 students in the school choir are fifth graders. How many fifth graders are in the choir? Write an expression and estimate the solution. Then use the standard algorithm to multiply or divide.

Expression: _____

How can you estimate?

_____

_____

There are _____ fifth graders in the choir.

10. Becca feeds her hamster, Squirt, 0.85 ounces of hamster food each day. How many days can Becca feed Squirt from a 12.75-ounce bag of hamster food? Write an expression and estimate the solution. Then use the standard algorithm to multiply or divide.

Expression: _____

How can you estimate?

_____

_____

_____

Becca can feed Squirt for _____ days.

STOP

Unit 6 Cumulative Review

1. Lilli earns $360 by babysitting. If Lilli charges $7.50 for each hour of babysitting, how many hours does she babysit?

Lilli babysits for _____ hours.

2. Divide. Write the answer in simplest form.

$\frac{1}{4} \div 6 =$ _____

3. Cade has 0.85 of a pound of chocolate chips. He uses 0.4 of the chips to make cookies. How many pounds of chocolate chips did Cade use to make the cookies?

Cade used _____ pounds of chocolate chips.

4. A factory machine makes 249 bolts each minute. How many bolts can the machine make in 58 minutes?

The factory can make _____ bolts in 58 minutes.
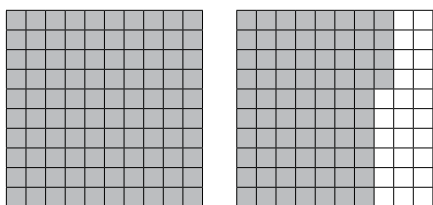
5. Multiply. Write the product in simplest form.

$\frac{5}{8} \times \frac{3}{10} =$ _____

6. A concert hall has 3,402 seats set up in 81 rows. Each row has the same number of seats. How many seats are in each row?

There are _____ seats in each row.

7. Round 39.28 to the nearest whole number. _____

8. What amount of money does the model represent? _____

9. Jamal and Khary have a pizza for dinner. Jamal eats $\frac{3}{8}$ of the pizza and Khary eats $\frac{2}{8}$ of the pizza. What fraction of the pizza do Jamal and Khary eat together?

Jamal and Khary eat _____ of the pizza.

10. Aaliyah's cat weighs 2 times more than Farah's kitten. If Aaliyah's cat weighs 6 pounds, how many pounds does Farah's kitten weigh?

Farah's kitten weighs _____ pounds.

11. Milla gets a pet rabbit. She feeds her rabbit 2 carrots each week. The table shows the total number of carrots Mila has fed to the rabbit after each week. Complete the table and graph the number pattern on the coordinate grid.

Week	Total Carrots
0	0
1	2
2	4
3	
4	
5	
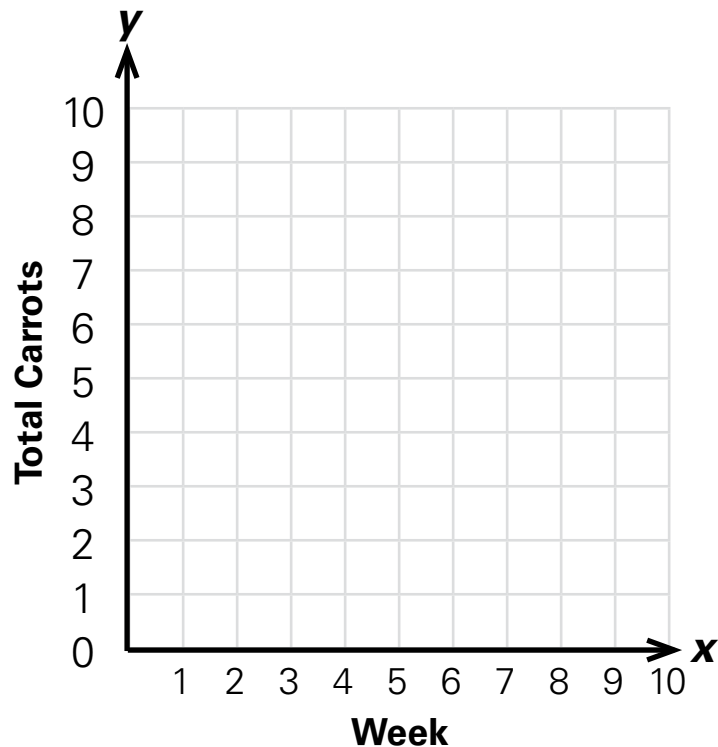
12. Multiply. Write the product in simplest form.

$$6 \times \frac{2}{3} = \underline{\hspace{1cm}}$$

13. Complete the number string.

$5 \times 1 = 5$

$5 \times 10 = \underline{\hspace{2cm}}$

$5 \times 10 \times 10 = \underline{\hspace{2cm}}$

$5 \times 10 \times 10 \times 10 = \underline{\hspace{2cm}}$

14. Angel walks $\dfrac{63}{100}$ of a mile to get to school. Write the distance Angel walks in decimal form.

Angel walks _____ of a mile.

15. Tomás plans to decorate 8 tables for a party with the same number of balloons on each table. He has 12 bags of balloons with 4 balloons in each bag. How many balloons can Tomás put on each table?

Tomás can put _____ balloons on each table.