

What do you see as your strengths in math?

Math is... Mindset
What are my strengths in math?

On My Own

Name _____

What is my math story?

Answers may vary.



What's your favorite thing about math?

Math is... Mindset
What did I like about math today?

Work Together

What are some other questions you can ask your teacher about their math story?

Answers may vary.

Reflect

What about my "Math Me" do I want someone else to know?

Answers may vary.

Learn

Heather added two 2-digit numbers.
There wasn't a zero in either number.

$$\square + \square = 100$$

What could be the numbers Heather added?

When we do math, we use many strategies to make sense of problems.

I know:

- The two numbers have a sum of 100.
- The numbers do not have zeros.
- I can write an equation.

$$\square + \square = 100$$

Math is... **Exploring**

What do I know about the problem?

I can ask:

- What two addends sum to 100?
- Can the two numbers be 50 and 50?
Or 60 and 40?

$$60 + 40 = 100$$

No, because those numbers have zeros.

Math is... **Planning**

What questions can I ask myself about the numbers?

When we do math, we work to solve problems but sometimes the first try doesn't work. We keep trying and don't give up.

I can think about different numbers to try.

$$\square + \square = 100$$

Math is... **Perseverance**

What is another way to think about the problem?

When we do math, we think about numbers in all sorts of ways.

The digits in the ones place and the tens place must add to 10. I can think about numbers that add to 10.

$$3 + 7 = 10$$

Math is... **Thinking**

How can I think about the numbers?

What other numbers do I know that sum to 10?

- 5 + 5, 4 + 6, 2 + 8 all sum to 10

When we do math, we think about how numbers and quantities relate.

Will I need to regroup ones to a ten or tens to a hundred?

- If the numbers in the ones place add up to 10, I will need to regroup.

What does that mean for the numbers in the tens place?

- The numbers in the tens place must add up to 9.

Math is... **Connections**

What questions can I ask myself about the numbers?

Work Together

Juno added two different 2-digit numbers.
Neither number had a zero in it.
The sum of the new numbers is 50.
What could the two numbers be?

Sample answer: The two numbers could be 29 and 21.

On My Own



Name _____

On another problem, Heather added three different 2-digit numbers.

None of the 2-digit numbers had a zero in it.

The sum of Heather's new numbers is 75.

What might be Heather's three numbers?

Sample answer: The three numbers could be 37, 24, and 14. I can think about which three numbers sum to 5 or 15. Then find 3 numbers that sum to 70 or 60.

Reflect

Tell about a time when you had a problem and you didn't give up. It might be a math problem, but it might be a problem you had playing a game, playing a sport, playing an instrument, drawing a picture, or doing a puzzle.

Answers may vary.

Learn

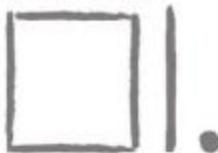
Jackson has 7 base-ten blocks.

What numbers might Jackson make with all seven of his blocks?

When we do math, we make models of problems to help us think about the math.

I can make a drawing to visualize the base-ten blocks.

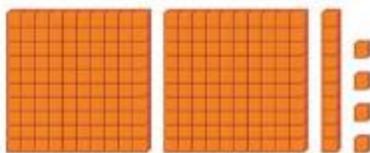
- There are three different kinds of base-ten blocks. I'll draw each kind.



Math is... In My World
How can I visualize the problem?

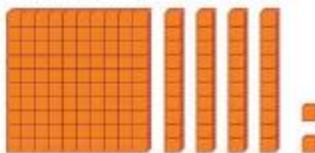
I can use drawings or manipulatives to represent the problem.

- I need to have 7 blocks in all.



Math is... In My World
How can I represent the problem?

I can think about other solutions.

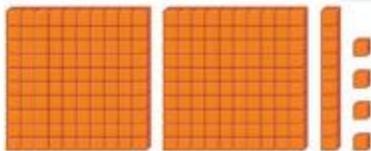


When we do math, we use different tools. Sometimes any tool can work and other times, one tool is the best choice.

I can use base-ten blocks to represent and solve the problem.

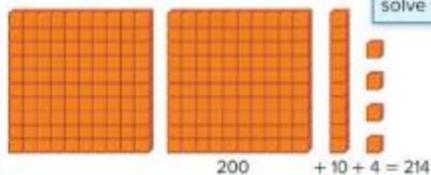
- Jackson might have flats, rods, or units. He could have 2 flats, 1 rod, and 4 units.

Math is... Choosing Tools
What tool can I use to represent the problem?



Base-ten blocks can help me show the blocks and numbers that Jackson made.

Math is... Choosing Tools
What tools can I use to solve the problem?



Work Together

Jackson grabbed 5 base-ten blocks from the bin. What numbers might Jackson make with all five of his blocks?

Sample answer: Jackson might have 1 flat, 3 rods and 1 unit, so the number is 131.

On My Own

Name _____

Jamil grabbed six blocks and three of the blocks were the same. What are some of the numbers Jamil might make with all 6 of his blocks?

Sample answer: The three blocks that are the same could be 3 flats. He might also have 1 rod and 2 units, so one number is 312. If the three blocks that are the same are rods, Jamil might have 1 flat, 3 rods, and 2 units, representing 132.

Reflect

What are some ways I can show a problem in math?

Answers may vary.

What tools have I used in math before?

Answers may vary.

Learn

Eva has 9 coins in her pocket.
She has more than \$1.00 but less than \$2.00.

How much money might Eva have in her pocket?

When we do math, we explain and defend our thinking. Sometimes we use words to create an argument. Sometimes we use numbers and pictures.

I can use words, equations, or drawings to explain my thinking.

Eva might have:

 = 50¢

 = 40¢

 = 10¢

 = 1¢

Her total, \$1.01 is between \$1 and \$2.

Math is... Explaining
How can I explain my thinking?

When we do math, we listen to the arguments of others and think about what makes sense and what doesn't.

Someone else might have another idea. They might think that Eva has:

3 quarters = 75¢

2 dimes = 20¢

4 nickels = 20¢

0 pennies = 0¢

Her total, \$1.15 is between \$1 and \$2.

Math is... Critiquing
Do others' ideas make sense to me?

When we do math, we think about whether an estimate or an exact answer is appropriate.

I need an exact answer that is between \$1 and \$2.

Math is... Precision
Do I need an exact answer or an estimate?

When we make arguments, we try to be precise. We use correct vocabulary and make sure our calculations are accurate. We label our drawings and include units of measurement.

I labeled each drawing with the value of the coin. Quarters are 25¢. Dimes are 10¢. Nickels are 5¢ and pennies are 1¢.



Math is... Precision
What units did I use to label my drawings?

Work Together

Oscar has two bills and five coins. He has between \$5.00 and \$10.00.

What bills and coins might Oscar have? How do you know?

Sample answer: Oscar might have one \$5 bill, one \$1 bill, three quarters, one dime, and one nickel for a total of \$6.90.

Learn

How are the equations in the Be Curious related?

When we do math, we look for patterns and relationships.

I know that I see a pattern when I see something over and over again.

- There is a pattern in these equations.
- The digits in the ones place always add to 10.

$$\begin{array}{ll} 1 + 9 = 10 & 21 + 9 = 30 \\ 2 + 8 = 10 & 22 + 8 = 30 \\ 3 + 7 = 10 & 23 + 7 = 30 \end{array}$$

Math is... Patterns
How do I know that I see a pattern?

Patterns can help me solve a problem.

- Using the pattern above, I can solve these equations.

$$\begin{array}{l} 41 + 9 = ? \\ 42 + 8 = ? \\ 43 + 7 = ? \\ 44 + 6 = ? \end{array}$$

Math is... Patterns
How can the pattern help me solve the problem?

Patterns can help you solve problems efficiently. Patterns can also help you solve problems that are similar.

I can see a rule in the equations.

$$\begin{array}{ll} 1 + 9 = 10 & 21 + 9 = 30 \\ 2 + 8 = 10 & 22 + 8 = 30 \end{array}$$

Math is... Generalizations
What is the rule for this pattern?

- Combinations of ten are like combinations of 30.
- 21 is 20 more than 1 and 30 is 20 more than 10.

I can use this pattern to find other sums.

- If I know that $4 + 6 = 10$, then I can know $24 + 6 = 30$ and $84 + 6 = 90$.

Math is... Generalizations
How does this pattern help me work more efficiently?

Work Together

How are these equations related?

$$\begin{array}{llll} 8 + 9 = ? & 8 + 19 = ? & 8 + 29 = ? & 8 + 59 = ? \\ 4 + 9 = ? & 4 + 39 = ? & 4 + 69 = ? & 4 + 99 = ? \end{array}$$

What other equations can you write that follow the same pattern?

Sample answer: Adding 9 gives a sum one less than adding 10. $8 + 9 = 18 - 1$ or 17 and $4 + 9 = 14 - 1$ or 13. The digit in the ones place for the first row will always be 7; the digit in the ones place for the second row will always be 3.

On My Own



Name _____

How are these equations related?

$$70 + 90 = ? \quad 70 + 190 = ? \quad 70 + 290 = ? \quad 70 + 590 = ?$$

$$50 + 90 = ? \quad 50 + 290 = ? \quad 50 + 490 = ? \quad 50 + 690 = ?$$

What other equations can you write that follow the same pattern?

Sample answer: Adding 90 gives a sum 10 less than adding 100, so $70 + 90 = 70 + 100 - 10$ or 160.

Reflect

What other patterns and relationships do you know in math? Tell how those patterns can help you.

Answers may vary.

Learn

How do we do math?

When we do math, we solve problems.

- We make sense of problems.
- We understand relationships among quantities.
- We look for patterns and use patterns to help us solve problems.
- We use tools. We select the tool that works best for us.
- We don't quit. If we get stuck, we look for different ways.

Math is... Mindset
What can I do when I feel stuck?

When we do math, we often work together.

- We listen carefully.
- We share our thinking.
- We are respectful of others' ideas.
- We critique the ideas of others. We don't criticize others.
- We share tools and take turns.

Math is... Mindset
What can I do to be an active listener?

When we do math, sometimes we work on our own.

- We stay focused.
- We look for help when we are stuck.

Math is... Mindset
What can I do to stay focused on my work?

Work Together

How do we work together well?

Answers may vary.

What does a good listener do?

Answers may vary.

How do we use tools responsibly?

Answers may vary.

What do I do when I'm stuck?

Answers may vary.

On My Own

Name _____

What are two promises our class can make so that we work together well?

Answers may vary.



Reflect

What are my responsibilities to make sure we can all learn math well?

Answers may vary.

Unit Review

Name _____

Review

1. What are some ways we can make sense of a problem?
Answers may vary.
2. Why is asking questions important when doing math?
Answers may vary.
3. What does it mean to be precise when doing mathematics?
Answers may vary.
4. How can patterns help us solve problems?
Think of an example.
Answers may vary.

Review

What should be our classroom norms for doing math? Write up to 5 norms.

1. **Answers may vary.**
- 2.
- 3.
- 4.
- 5.

Reflect

Choose one norm you wrote and tell why it is important.

Answers may vary.

Fluency Practice

Name _____

Fluency Strategy

You can count on to add. You can count backwards to subtract.

When you add or subtract 0, the number does not change.

$$13 + 0 = 13$$

$$26 - 0 = 26$$

When you add 1 or 2, you count forwards 1 by 1 or 2.

$$38 + 1 = 39$$

$$38, 39, \dots$$

$$80 + 2 = 82$$

$$80, 81, 82, \dots$$

When you subtract 1 or 2, you count backwards 1 or 2.

$$52 - 1 = 51$$

$$52, 51, \dots$$

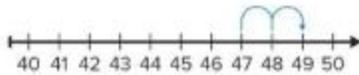
$$93 - 2 = 91$$

$$93, 92, 91, \dots$$

Fluency Flash

How can you represent the number line with an equation?

1.



$$47 + 2 = 49$$

2.



$$96 - 1 = 95$$

Fluency Check

How can you find the sum or difference?

$$3. 46 + 1 = \underline{47}$$

$$10. 28 + 2 = \underline{30}$$

$$4. 57 + 0 = \underline{57}$$

$$11. 51 - 2 = \underline{49}$$

$$5. 16 + 2 = \underline{18}$$

$$12. 79 + 2 = \underline{81}$$

$$6. 24 - 2 = \underline{22}$$

$$13. 72 - 1 = \underline{71}$$

$$7. 67 - 2 = \underline{65}$$

$$14. 81 - 0 = \underline{81}$$

$$8. 39 - 1 = \underline{38}$$

$$15. 78 - 0 = \underline{78}$$

$$9. 21 + 0 = \underline{21}$$

$$16. 89 + 1 = \underline{90}$$

Fluency Talk

Ben says that adding 2 is like adding 1 and then adding 1 again. Is he correct? Explain your answer.

Yes. Sample answer: When you count on 2, you count on 1 and then 1 again.

The answer to Madeleine's problem is the same as the number she started with. How could this be true? Explain your answer.

Sample answer: She could have either added or subtracted 0.

Name _____

Penny Estimation

Listen to your teacher. Estimate the number of pennies that will fit in each rectangle.



A

B

C

Learn

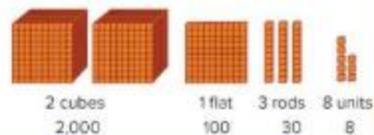
What are some ways to represent this number?



You can use a place-value chart.

thousands	hundreds	tens	ones
2	1	3	8

You can use base-ten blocks.



You can read and write the number in different forms.

- standard form** 2,138
- expanded form** $2,000 + 100 + 30 + 8$
- word form** two thousand, one hundred thirty-eight

Math is... Generalizations

4-digit numbers have thousands, hundreds, tens, and ones.

How is representing 4-digit numbers the same as representing 3-digit numbers?

Work Together

How can you represent 1,208 in expanded form and word form?

$1,000 + 200 + 8$
one thousand, two hundred eight

On My Own



Name _____

What number is represented by the base-ten blocks?

1. 

thousands	hundreds	tens	ones
1	5	3	2

2. 

thousands	hundreds	tens	ones
1	0	9	8

How can you represent the number in the place-value chart and in expanded form?

3. 2,446

thousands	hundreds	tens	ones
2	4	4	6

 $2,000 + 400 + 40 + 6$

4. 4,729

thousands	hundreds	tens	ones
4	7	2	9

 $4,000 + 700 + 20 + 9$

How can you represent the number shown in standard form and expanded form?

5. three thousand, one hundred twelve
 $3,112$ $3,000 + 100 + 10 + 2$
6. six thousand, eighty-seven
 $6,087$ $6,000 + 80 + 7$
7. seven thousand, two hundred twenty-four
 $7,224$ $7,000 + 200 + 20 + 4$

How can you represent the number shown in standard form and expanded form?

8.  $1,553$ $1,000 + 500 + 50 + 3$

How can you represent the number in standard form?

9. $8,000 + 500 + 2$ 10. $9,000 + 50 + 2$
 $8,502$ $9,052$

11. **STEM Connection** 1,455 customers visited Saffron's pastry shop this month. Last month 1,355 customers came to the shop. Explain how she can use place value to determine the difference in the number of customers.



Sample answer: There were 100 more customers this month because the digit in the hundreds place increased by 1.

12. **Extend Your Thinking** Use the digits shown to write a number with the least possible value. Write the number in standard form, expanded form, and word form.

3 8 8 2
 $2,388$ $2,000 + 300 + 80 + 8$
 two thousand, three hundred eighty-eight

Reflect

How does place value help you write a number in word form?

Answers may vary.

Math is... Mindset

What feelings did you experience about learning math?

Learn

About how many blocks are there?

You can round to describe about how many.

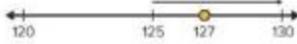
When you **round** to the nearest 10 or 100, you determine a ten or a hundred that is close to the original number.



▶ One Way Use a number line to round.

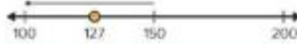
Round to the nearest 10.

127 is to the right of the halfway point. It rounds to 130.



Round to the nearest 100.

127 is to the left of the halfway point. It rounds to 100.



▶ Another Way Use place value to round.

Round to the nearest 10.

127

If the digit in the ones place is 5 or greater, round up.

130

Round to the nearest 100.

127

If the digit in the tens place is less than 5, round down.

100

You can round to make a number easier to work with when an exact number is not needed.

Math is... **Choosing Tools**
Why is a number line helpful for rounding?

Work Together

Ellie rounds 255 to 260. Carter rounds 255 to 300. Why are their rounded numbers different?

Sample answer: Ellie rounded 255 to the nearest ten. Carter rounded 255 to the nearest hundred.

On My Own

Name _____

Use a number line to round.

1. Round 27 to the nearest 10.

30



2. Round 896 to the nearest 10.

900



Use place value to round.

3. Round 48 to the nearest 10.

50

4. Round 273 to the nearest 10.

270

Use a number line to round. Show your work.

5. Round 436 to the nearest 100.

See students' drawings.

6. Round 672 to the nearest 100.

See students' drawings.

436 rounded to the nearest 100 is 400.

672 rounded to the nearest 100 is 700.

7. How can the number 78 round to 80 and 100? Explain.

Sample answer: 78 rounded to the nearest 10 is 80 and 78 rounded to the nearest 100 is 100.

8. A number rounded to the nearest 10 is 240. What number could it be? **Sample answer: 235**

9. How can you use the number line to show why 678 rounded to the nearest 100 is 700? Explain your reasoning.



Sample answer: 678 rounds to 700 because it is to the right of the halfway point.

10. **Error Analysis** Tess says that 315 rounded to the nearest 10 is 310. Do you agree? Explain your reasoning.

No; Sample answer: If the number in the ones place is 5 or greater, 315 rounds up to the greater 10, which would be 320.

11. Jack is making a fruit salad. He puts in 9 strawberries, 25 orange wedges, 19 kiwi slices, 27 blueberries, 16 grapes, and 21 raspberries. Which fruits does he use about 20 of?

kiwi, grapes, and raspberries

12. **Extend Your Thinking** Sam is shopping. He has \$50. He wants to buy dog food that costs \$15, vegetables that cost \$22, and fruits that cost \$12. How can Sam make sure he has enough money?

Sample answer: He can round \$15 to \$20, \$22 to \$20, and \$12 to \$10, and then add them together. $20 + 20 + 10 = 50$, so Sam has enough money.

Reflect

When might you want to round to the nearest 10 instead of the nearest 100?

Answers may vary.

Math is... Mindset

How did you connect with your classmates?

Unit 2

Rounding Numbers



Name _____

Circle *all* correct answers for the problem.

1. Suppose you rounded to the nearest 10. Which numbers below would round to 630?
Circle *all* of them.

- a. 632
- b. 638
- c. 627
- d. 625
- e. 623
- f. 635
- g. 534
- h. 529

Explain your choices.

Answers will vary.

Circle *all* correct answers for the problem.

2. Suppose you rounded to the nearest 100. Which numbers below would round to 900? Circle *all* of them.

- a. 956
- b. 871
- c. 943
- d. 839
- e. 962
- f. 819
- g. 988
- h. 925

Explain your choices.

Answers will vary.

Learn

Carter is 122 centimeters tall. The giraffe is 576 centimeters tall.



About how much taller is the giraffe?

You can **estimate** the difference. An estimate is close to the exact answer.

► **One Way** Round the numbers to estimate the difference.

$$576 - 122 = ?$$

$$\begin{array}{r} \downarrow \quad \downarrow \\ 580 - 120 = 460 \end{array}$$

$$576 - 122 = ?$$

$$\begin{array}{r} \downarrow \quad \downarrow \\ 600 - 100 = 500 \end{array}$$

► **Another Way** Use **compatible numbers** to find the difference. Compatible numbers are easy to work with.

$$576 - 122 = ?$$

$$\begin{array}{r} \downarrow \quad \downarrow \\ 575 - 125 = 450 \end{array}$$

Math Is... **Choosing Tools**

How can estimating a sum or difference help to detect possible errors?

You can use rounding or compatible numbers to **estimate** an answer when you do not need an exact sum or difference.

Reflect On Your Learning

I am confused.

I'm still learning.

I understand.

I can teach someone else.



Work Together

An elephant eats 428 pounds of food on Thursday and 503 pounds of food on Friday. About how many pounds of food does the elephant eat in the two days?

Sample answer: about 930 pounds;
428 → 430, 503 → 500; 430 + 500 = 930

On My Own



Name _____

What is a reasonable estimate of the sum or difference?

Write or draw to show your thinking.

1. $423 + 168 = ?$

Sample answer:
 $423 \rightarrow 420; 168 \rightarrow 170;$
 $420 + 170 = 590$

2. $? = 695 - 205$

Sample answer:
 $695 \rightarrow 700; 205 \rightarrow 200;$
 $700 - 200 = 500$

3. $? = 317 + 248$

Sample answer:
 $317 \rightarrow 320; 248 \rightarrow 250;$
 $320 + 250 = 570$

4. $473 + 218 = ?$

Sample answer:
 $473 \rightarrow 500; 218 \rightarrow 200;$
 $500 + 200 = 700$

5. $798 - 307 = ?$

Sample answer:
 $798 \rightarrow 800; 307 \rightarrow 300;$
 $800 - 300 = 500$

6. $? = 835 - 466$

Sample answer:
 $835 \rightarrow 800; 466 \rightarrow 500;$
 $800 - 500 = 300$

7. How can you use rounding to estimate the sum of $389 + 223$?

Sample answer: I can round 389 to 400 and 223 to 200. $400 + 200 = 600$.

8. A complete set of baseball cards has 678 cards. Julio needs 273 more cards to complete his set. How can you use rounding to find about how many cards are in Julio's collection?

Sample answer: I can round 678 to 680 and 273 to 270, and then subtract 270 from 680.

9. The Comic Book Shack displays 318 comic books near the front door and keeps 502 comic books in the storage room. How can you use compatible numbers to find about how many comic books are in the store?

Sample answer: I can change 318 to 320 and 502 to 500 to make a new ten, and then add.

10. **STEM Connection** Saffron's bakery needs to decorate 355 cupcakes for an event. It has decorated 223 so far. How can she determine about how many more cupcakes they need to decorate?

Sample answer: She can round 355 to 360, 223 to 220, and then subtract. They need to decorate about 140 more cupcakes.



11. Melinda estimates she traveled 830 miles last Monday and Tuesday. She traveled 412 miles on Tuesday. About how many miles could she have traveled on Monday?

Sample answer: about 420 miles

12. **Extend Your Thinking** Jason has 744 flyers to deliver. If he has delivered 62 flyers at each of his last 2 stops, about how many flyers does he have left to deliver?

Sample answer: about 620 flyers

Reflect

When might you need to estimate a sum or difference in your life?

Answers may vary.

Math is... Mindset

How have you worked to understand how others are feeling?

Learn

At the school carnival, Billy won 27 tickets at balloon darts, 40 tickets at ring toss, and 53 tickets at basketball toss.



How many tickets did he win?

One Way You can group addends in any way and the sum will be the same.

$$\begin{array}{r} 27 + 53 + 40 \\ \swarrow \quad \searrow \\ 80 + 40 = 120 \end{array}$$

$$\begin{array}{r} 27 + 53 + 40 \\ \swarrow \quad \searrow \\ 27 + 93 = 120 \end{array}$$

Add 53 and 40 first.

Another Way You can switch the order of the addends and the sum will be the same.

$$27 + 53 + 40 = 120$$

$$40 + 27 + 53 = 120$$

Billy won 120 tickets.

The properties of addition can help you be more efficient when you add.

Grouping addends or changing the order of the addends can make the problem easier to solve.

Math is... Structure

How can changing the order of addends make it easier to add?

Work Together

Josh is completing the equation $797 + 111 = \underline{\quad} + 797$. Josh adds $797 + 111$ and subtracts 797 to complete the equation. How can Josh complete the equation more efficiently?

Sample answer: The order of the addends does not change the sum. The sum will be the same on both sides of the equation. So, $797 + 111$ is equal to $111 + 797$.

On My Own



Name _____

How can you make the equation true?

1. $218 + 325 = 325 + \underline{218}$ 2. $465 + \underline{78} = 78 + 465$

3. $529 + 407 = \underline{407} + 529$ 4. $\underline{505} + 93 = 93 + 505$

5. Mauricio had a sale. The table shows the number of items he sold each day. Which expressions show how to find the total number of items Mauricio sold? Choose all that apply.

A. $42 + 67 + 58$

B. $67 - 58 + 42$

C. $58 + 42 + 67$

D. $58 + 67 + 24$

Items Sold	
Monday	58
Tuesday	67
Wednesday	42

6. How can you group the addends to make it easier find the sum? Explain your thinking.

$$372 + 264 + 228$$

Sample answer: I can add $372 + 228 = 600$ because I can make a hundred. Adding to a hundred makes the problem easier to solve. Then I would add $600 + 264$.

How can you show one way to group the addends and solve?

7. $157 + 17 + 783$

Sample answer:
 $783 + 17 = 800,$
 $800 + 157 = 957$

8. $198 + 502 + 155$

Sample answer:
 $198 + 502 = 700,$
 $700 + 155 = 855$

9. $135 + 458 + 42$

Sample answer:
 $458 + 42 = 500,$
 $500 + 135 = 635$

10. $235 + 105 + 317$

Sample answer:
 $235 + 105 = 340,$
 $340 + 317 = 657$

11. **STEM Connection** Saffron needs to order the items listed. How can she group these numbers to find her total cost?

Sample answer:
 $358 + 142 = 500,$
 $500 + 367 = 867; \$867$

flour	\$367
boxes	\$358
cupcake liners	\$142

12. **Extend Your Thinking** Mrs. Ruiz is checking her receipt. The three items cost \$305, \$350, and \$195. How can she use properties of addition to add more efficiently?

Sample answer: She can first change the order of the addends to add $305 + 195 + 350$. Then she can group 305 and 195 to make a hundred.
 $305 + 195 = 500; 500 + 350 = 850$

Reflect

How can changing the order of three addends help you add more efficiently?

Answers may vary.

Math is... Mindset

How did you avoid getting distracted?

Learn

Mena notices that when she adds an even number and an odd number, the sum is odd.

$72 + 13 = 85$
$18 + 41 = 59$
$30 + 25 = 55$

How can she determine if the sum of an even number and an odd number is always odd?

When you add **even numbers** and **odd numbers**, there are patterns in the sums.

When you add two even numbers, the sum is even.

$$246 + 100 = 346$$

$$432 + 224 = 656$$

$$318 + 480 = 798$$

When you add two odd numbers, the sum is even.

$$547 + 155 = 702$$

$$325 + 631 = 956$$

$$421 + 273 = 694$$

When you add an even number and an odd number, the sum is odd.

$$272 + 723 = 995$$

$$546 + 231 = 777$$

$$647 + 244 = 891$$

Math is... Generalizations

Why is it true that the sum of two odd numbers is always even?

You can use addition patterns to help you determine a sum, or to check your work, when you add 3-digit numbers.

Work Together

Nisha writes $135 + 232 = 167$. She says her sum is correct because an odd number added to an even number equals an odd sum. Do you agree with her reasoning? Explain.

No; Sample answer: For this equation, Nisha's reasoning is not correct because the sum is less than one of the addends.

On My Own



Name _____

What makes the equation true? Write *even* or *odd*. Then write two equations with 3-digit numbers to support your answer.

1. even = even + even

Sample answer:

$$102 + 304 = 406;$$

$$312 + 442 = 754$$

2. odd + even = odd

Sample answer:

$$225 + 202 = 427;$$

$$611 + 214 = 825$$

3. odd + odd = even

Sample answer:

$$671 + 101 = 772;$$

$$463 + 505 = 968$$

4. even + odd = odd

Sample answer:

$$222 + 333 = 555;$$

$$104 + 105 = 209$$

5. even + even = even

Sample answer:

$$322 + 444 = 766;$$

$$312 + 442 = 754$$

6. even = odd + odd

Sample answer:

$$811 + 101 = 912;$$

$$499 + 111 = 610$$

What is the sum? Use patterns to help justify your answer.

7. $486 + 123 = \underline{609}$

Sample answer:

My sum is odd. An even addend and an odd addend equal an odd sum.

8. $154 + 272 = \underline{426}$

Sample answer:

My sum is even. An even addend and an even addend equal an even sum.

9. Why is the sum of a number with a 3 in the ones place and a number with a 4 in the ones place always an odd sum?

Sample answer: An odd addend plus an even addend equals an odd sum.

10. How can you explain why the digits in the ones place of the addends determine if the sum will be even or odd?

Sample answer: The digits in the ones place determine if the addends are odd or even. The sum will be odd or even depending on the addends.

11. **STEM Connection** A baking sheet can hold an even or odd number of pastries. If Saffron wants an even number of pastries, how can she arrange the pastries on 2 sheets?

Sample answer: She can put an odd or an even number of pastries on each sheet.



12. **Extend Your Thinking** Carol designs scarves. If she uses 112 blue, 113 yellow, and 114 brown stripes on a scarf, will the scarf have an even or odd number of stripes? Explain how you know.

odd; Sample answer: Add the digits in the ones place. $2 + 3 + 4 = 9$ and 9 is odd.

Reflect

How can addition patterns help you justify that a sum is correct?

Answers may vary.

Math is... Mindset

How did you use strategies to work more efficiently?

Learn

Maggie and Tanesha break apart the addends by place value to add $367 + 145$. They show their work in different ways.

hundreds	tens	ones
3	6	7
1	4	5

How can each girl show their work in a different way?

You can **decompose**, or break apart, the addends by place value to find partial sums. Then, add the partial sums to find the sum.

One Way You can write the addends in a row.

$$\begin{aligned}
 367 + 145 &= ? \\
 300 + 100 &= 400 \\
 60 + 40 &= 100 \\
 7 + 5 &= 12 \\
 400 + 100 + 12 &= 512
 \end{aligned}$$

Another Way You can stack the addends.

$$\begin{array}{r}
 367 \\
 + 145 \\
 \hline
 300 + 100 = 400 \\
 60 + 40 = 100 \\
 7 + 5 = 12 \\
 \hline
 512
 \end{array}$$

partial sums

One addition strategy is to find partial sums and add them to find the sum. You can write the addends in this strategy in different ways.

Math is... Explaining

Why is the sum the same when the addends are in a row or stacked?

Work Together

Ari's work is shown. Jun sees Ari's work and says 500 is the sum of $309 + 225$. Do you agree? Explain your reasoning.

Sample answer: No. 500 is a partial sum. The partial sums are added together to get the sum of 534.

$$\begin{array}{r}
 309 \\
 + 225 \\
 \hline
 300 + 200 = 500 \\
 0 + 20 = 20 \\
 9 + 5 = 14 \\
 \hline
 534
 \end{array}$$

On My Own

Name _____

How can you decompose each addend? What is the sum?

- $247 + 564 = 811$
 $200 + 500 = 700$
 $40 + 60 = 100$
 $7 + 4 = 11$
 $700 + 100 + 11 = 811$
- 815
 $+ 148$
 900
 50
 $+ 13$
 963
- 729
 $+ 148$
 800
 60
 $+ 17$
 877
- $327 + 176 = 503$
 $300 + 100 = 400$
 $20 + 70 = 90$
 $7 + 6 = 13$
 $400 + 90 + 13 = 503$

- Whitney uses partial sums to add. Look at her work to determine which two numbers were in her original equation.
 $216 + 382 = 598$
 $200 + 300 = 500$
 $10 + 80 = 90$
 $6 + 2 = 8$
 $500 + 90 + 8 = 598$

- How can you determine which addends are in the original equation by looking at the partial products?
Sample answer: The numbers in the partial sum equations represent the parts of the original addends.
- Tyrone spent 172 days in school last year. If he attends school the same number of days next year, how many days will he spend in school in two years? **344 days**

How can you find the sums in a different way?

$$\begin{array}{r}
 8. \quad 475 + 325 = 800 \\
 400 + 300 = 700 \\
 70 + 20 = 90 \\
 5 + 5 = 10 \\
 700 + 90 + 10 = 800 \\
 \hline
 475 \\
 + 325 \\
 \hline
 700 \\
 90 \\
 + 10 \\
 \hline
 800
 \end{array}$$

$$\begin{array}{r}
 9. \quad 238 \\
 + 271 \\
 \hline
 400 \\
 100 \\
 + 9 \\
 \hline
 509
 \end{array}
 \quad
 \begin{array}{l}
 238 + 271 = ? \\
 200 + 200 = 400 \\
 30 + 70 = 100 \\
 8 + 1 = 9 \\
 400 + 100 + 9 = 509
 \end{array}$$



10. Eleanor's watch shows her steps before lunch. Then she took 486 more steps. How many total steps did she take?
953 steps

11. **Error Analysis** Amal adds $378 + 141$. She decomposes each number and adds $300 + 100 = 400$. She writes $378 + 141 = 400$. How can you explain her mistake?

Sample answer: She needs to find the other partial sums. Then she needs to add the partial sums to find the total sum.

12. **Extend Your Thinking** How can you solve $249 + 401 + 276$ using partial sums? Show your work. **Sample answer:**
 $200 + 400 + 200 = 800$; $40 + 0 + 70 = 110$;
 $9 + 1 + 6 = 16$; $800 + 110 + 16 = 926$

Reflect

Why is understanding place value important when using the partial sums strategy to add?

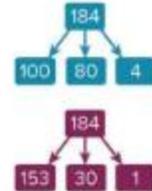
Answers may vary.

Math is... Mindset

What strengths did you use today? What can you work on?

Learn

Samir and Jen subtract $353 - 184$. Samir decomposes one number to subtract. Jen decomposes the same number in a different way to subtract.



Will Jen find the same difference as Samir?

One Way You can decompose one number by place value.

$$\begin{array}{l}
 353 - 184 = ? \\
 353 - 100 = 253 \\
 253 - 80 = 173 \\
 173 - 4 = 169 \\
 \hline
 353 - 184 = 169
 \end{array}$$

Another Way You can decompose one number in a different way.

$$\begin{array}{l}
 353 - 184 = ? \\
 353 - 153 = 200 \\
 200 - 30 = 170 \\
 170 - 1 = 169 \\
 \hline
 353 - 184 = 169
 \end{array}$$

One subtraction strategy is to decompose one number and then subtract the parts from the total. You can decompose numbers in different ways to subtract.

Math is... Explaining

Why is the difference the same when the number is decomposed differently?

Work Together

Hannah subtracts $572 - 378$. How can Hannah decompose one number in two different ways to subtract?

Sample answer: 378 could be decomposed into 300, 70, 2 and 6; $572 - 300 = 272$, $272 - 70 = 202$, $202 - 2 = 200$, $200 - 6 = 194$; 378 could also be decomposed into 372 and 6; $572 - 372 = 200$, $200 - 6 = 194$

On My Own



Name _____

How can you decompose the number in 2 ways?

1. 367
Sample answer:
 $300 + 60 + 7$;
 $350 + 10 + 7$
2. 876
Sample answer:
 $800 + 70 + 6$;
 $800 + 70 + 5 + 1$

How can you decompose one number to subtract? Why did you choose that way?

3. $495 - 122$
Sample answer:
 $100 + 20 + 2$; I can subtract the hundreds, tens, and ones quickly.
4. $639 - 370$
Sample answer:
 $300 + 30 + 40$; I can subtract 3 tens from 3 tens, then subtract 40 from 300.

How can you find the difference? Show the strategy you used.

5. $284 - 182 = \underline{102}$
Sample answer:
 $284 - 100 = 184$;
 $184 - 80 = 104$;
 $104 - 2 = 102$
6. $\underline{219} = 333 - 114$
Sample answer:
 $333 - 100 = 233$;
 $233 - 10 = 223$;
 $223 - 3 = 220$;
 $220 - 1 = 219$
7. $502 - 382 = \underline{120}$
Sample answer:
 $502 - 300 = 202$;
 $202 - 2 = 200$;
 $200 - 80 = 120$
8. $744 - 466 = \underline{278}$
Sample answer:
 $744 - 400 = 344$;
 $344 - 44 = 300$;
 $300 - 20 = 280$;
 $280 - 2 = 278$

9. **Error Analysis** Juan subtracts $345 - 101$. He decomposes 101 into 100 and 10 and subtracts the parts from 345. How can you help him understand his mistake?

Sample answer: He decomposed 101 incorrectly. $100 + 10 = 110$ not 101. He can decompose 101 into $100 + 1$ and subtract the parts from 345.

10. The table shows the number of people who attended the school fun fair each day. Show a strategy to find the difference between the greatest and least number of people.

Fun Fair Visitors	
Day	Number of People
Thursday	103
Friday	168
Saturday	257
Sunday	224

**$257 - 100 = 157$,
 $157 - 3 = 154$; 154 people**

11. A baker bakes 268 bread rolls. 155 are cinnamon rolls. The rest are plain rolls. How many plain rolls does she bake?
113 plain rolls
12. **Extend Your Thinking** Ana subtracts $438 - 342$ by decomposing 342. She subtracts 2, then 300, and finally 40. Can she subtract the parts in any order? Explain your reasoning.

Yes. Sample answer: The order does not matter if all parts of 342 are subtracted from 438.

Reflect

How do you decide how to decompose one number to subtract?

Answers may vary.

Math is... Mindset

How did creative thinking help you solve a problem?

On My Own



Name _____

How can you adjust the equation to solve?

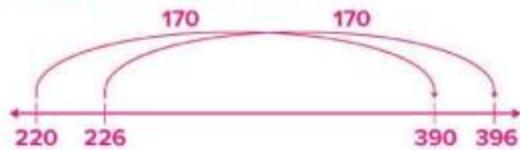
- | | |
|---|---|
| 1. $272 - 99 = \underline{173}$
Sample answer:
$273 - 100 = 173$ | 2. $139 + 216 = \underline{355}$
Sample answer:
$140 + 215 = 355$ |
| 3. $847 - 332 = \underline{515}$
Sample answer:
$845 - 330 = 515$ | 4. $398 + 147 = \underline{545}$
Sample answer:
$400 + 145 = 545$ |
| 5. $491 - 226 = \underline{265}$
Sample answer:
$495 - 230 = 265$ | 6. $129 + 139 = \underline{268}$
Sample answer:
$130 + 138 = 268$ |

7. Alex adjusted the equation $109 + 119 = ?$ to $110 + 118 = ?$. Describe how he adjusted the equation. Why do you think he did it in that way?

Sample answer: Alex took 1 away from 119 and added that 1 to 109 to make 110, which is an easier number to work with.

8. Show how you can adjust $396 - 226$. Use a number line to show that the new equation has the same difference.

Sample answer: $390 - 220 = 170$



Learn

There are 224 Tigers fans and 212 Hawks fans at the town football game. 109 more Tigers fans arrive late to the game.



How many more Tigers fans than Hawks fans are at the game?

Adjust Addition Equations

$$\begin{array}{r} 224 + 109 = ? \\ \begin{array}{cc} \boxed{-1} & \boxed{+1} \\ \downarrow & \downarrow \end{array} \\ 223 + 110 = 333 \end{array}$$

Subtract from one addend and add that amount to the other.

Adjust Subtraction Equations

$$\begin{array}{r} 333 - 212 = ? \\ \begin{array}{cc} \boxed{-2} & \boxed{-2} \\ \downarrow & \downarrow \end{array} \\ 331 - 210 = 121 \end{array}$$

Subtract or add the same amount to both numbers.

You can adjust numbers to get numbers that are easier to work with. Adjust both numbers to keep the sum or difference the same as the original.

Math is... Structure

How is adjusting a subtraction equation different from adjusting an addition equation?

Work Together

Marco adds $457 + 208$. He adjusts 457 to 460 and 208 to 211. He finds the sum 671. Do you agree with his strategy? Explain.

No. Sample answer: Marco added 3 to both addends. When you adjust addends, you need to subtract from one and add that amount to the other. He should add 3 to 457 and subtract 3 from 208 to add $460 + 205 = 665$.

9. You can adjust $236 - 119$ different ways. How can you explain one way you can adjust and why the equation is easier?

Sample answer: $237 - 120$ is easier because I can subtract 120 from 237 in just two parts. I can complete most of the subtraction mentally.

10. Melissa and Juan are finding $129 + 257$ by adjusting. Melissa tries solving using $130 + 258 = 388$ and Juan solves it using $130 + 256 = 386$. Which sum is correct? Explain.

Sample answer: 386 is correct because Juan kept the sum the same by adding 1 to 129 and subtracting 1 from 257.

11. **STEM Connection** Saffron completed 851 orders of pastries her first year. After her second year, she completed 926 orders. How many more pastry orders did she complete in her second year than in her first year?

Sample answer: $925 - 850 = 75$



12. **Extend Your Thinking** Yazmin adds $457 + 251$. She adjusts 251 to 250, but forgets to adjust 457. She adds $457 + 250 = 707$. How can she adjust the sum to fix her mistake? Explain your reasoning.

Sample answer: Because she subtracted 1 from 251, she can add 1 to her sum to find the correct sum for $457 + 251$.

Reflect

How can adjusting just one number affect the addition or subtraction equation?

Answers may vary.

Math is... **Mindset**

How have you worked as a team to achieve your goal?

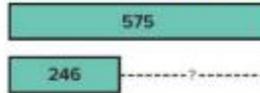
Learn

Adaline and her family are driving 575 miles to visit her grandmother. They drive 246 miles and stop for lunch.



How can you find how many miles they have left to drive?

You can represent the problem with a **bar diagram**.



You can write a subtraction equation with an unknown difference.

$$575 - 246 = ?$$

$$575 - 246 = \mathbf{329}$$

You can write an addition equation with an unknown addend.

$$246 + ? = 575$$

$$246 + \mathbf{329} = 575$$

Addition and subtraction are related. You can rewrite a subtraction equation as an addition equation with an unknown addend.

Math is... **Relationships**

How can using an unknown addend equation be helpful when you subtract?

Work Together

Deigo wants to use addition to solve the equation $478 - 326 = ?$. How can you explain this strategy?

Sample answer: He can rewrite the subtraction equation as an unknown addend equation $326 + ? = 478$. Then he can count on to find the difference. $478 - 326 = 152$

On My Own



How can you use the relationship between addition and subtraction to find the difference?

Name _____

How can you write a related addition equation for the subtraction equation?

1. $635 - 202 = ?$ **Sample answer: $202 + ? = 635$**

2. $400 - 151 = ?$ **Sample answer: $400 = 151 + ?$**

3. $825 - 134 = ?$ **Sample answer: $134 + ? = 825$**

4. **Error Analysis** Jayla knows she can use addition to subtract. She adds $301 + 447$ to find the difference of $447 - 301$. How can you help her understand how to use this strategy?

Sample answer: Jayla needs to rewrite her equation as $301 + ? = 447$ instead of adding the two numbers in the subtraction problem.

5. On Monday, 549 people visited the aquarium. On Friday, 823 people visited the aquarium. How many more people visited the aquarium on Friday?

a. How can you fill in the bar diagram to represent the problem?

823

549 -----?-----

b. How can you write an equation with an unknown to represent the bar diagram?

Sample answer: $549 + ? = 823$

6. $480 - 318 =$ 162 7. 121 = $300 - 179$

8. $705 - 239 =$ 466 9. $212 - 135 =$ 77

10. Evan and Kyle put together a 500-piece puzzle. Evan placed 247 pieces. How many pieces did Kyle place?

253 pieces

11. **STEM Connection** Saffron's Bake Shop can spend \$700 to buy a large and a small mixer. She spends \$411 on the large mixer. How much does she have left to spend on a small mixer?

\$289

12. **Extend Your Thinking** Kwan says that he can solve $445 - ? = 239$ by using the equation $445 + 239$. Do you agree? Explain why.

Sample answer: No. The sum of $445 + 239$ is 684. If you replaced the unknown with 684, the subtraction equation would not be true.



Reflect

How are addition and subtraction related?

Answers may vary.

Math is... Mindset

How did you show you understand how others are feeling?

Learn

Last year the library's collection of books grew from 350 to 722 books. This year 169 books were added to the library.

What strategies can you use to find the total number of books in the library?

Math is... Exploring

How can you decide which information in the problem is useful?

Partial Sums You can decompose each addend by place value and add the place values to find partial sums. Then add the partial sums to find the total.

$$722 + 169 = ?$$

$700 + 100 = 800$	$700 + 100$	800
$20 + 60 = 80$	$20 + 60$	80
$2 + 9 = 11$	$2 + 9$	11
$800 + 80 + 11 = 891$		891

Adjust Addends You can adjust the addends to numbers that are easier to work with. Subtract from one addend and add that amount to the other addend.

$$722 + 169 = ?$$

-1	$+1$
↓	↓
$721 + 170 = 891$	

You can use any addition strategy to find the sum. You can decide which addition strategy is most efficient for you.

Work Together

Angel and Daniel find the sum of $348 + 227$. Angel adjusts the addends. Daniel uses partial sums. Can either strategy be used to solve? Explain your reasoning.

Yes. Sample answer: You will find the sum 575 using either strategy. You can choose what strategy works best for you.

On My Own

Name _____

How can you solve the equation?

1. $437 + 269 = \underline{706}$ 2. $\underline{566} = 123 + 443$

3. $\underline{879} = 367 + 512$ 4. $791 + 111 = \underline{902}$

5. **Error Analysis** Priya is adding $327 + 478$. Priya adds 3 to 327 to add $330 + 478$. Then she subtracts 3 from the sum. Do you agree with her strategy? Explain.

Sample answer: Yes. Priya added 3 to one addend, but did not subtract 3 from the other addend, so she needs to subtract that same number from the sum.

6. Sam adds $249 + 281$ by writing his addends in a row. What is another way Sam can show $249 + 281$?

Sample answer: $249 + 281$

7. Max's little brother Henry is 2 years old. There are 365 days in a year. How many days old is Henry?

730 days old

How can you solve the equation? Explain your addition strategy.

8. $458 + 139 = \underline{597}$

Sample answer: I chose to adjust the addends because 458 is close to 450, which is easier to work with.

9. $719 + 234 = \underline{953}$

Sample answer: I chose to find partial sums because it was easy for me to add each number by place value.

10. Mr. Perez needs 650 sheets of construction paper for his class art project. How many packs of this construction paper should he buy?

3 packs



11. Tryon School raised \$345 at their school fundraiser and \$486 at their bake sale. They used \$650 of the money they raised to buy new playground equipment. How much money did Tryon School raise?

\$831

12. **Extend Your Thinking** The community center had 113 swimmers in the fall class and 235 swimmers in the winter class. The summer class had 105 more swimmers than both classes combined. How many swimmers were in the summer class?

453 swimmers

Reflect

How do you decide which addition strategy to use when solving a problem?

Answers may vary.

Math is... Mindset

How did you use your skills or interests to help you with your work?

Learn

Mateo sold 543 tickets to the newest action movie Friday night. He sold 134 fewer tickets on Saturday night than Friday. Then Sunday afternoon he sold 248 tickets.

Math is... Exploring

How is this problem like other problems you have solved?

What strategies can you use to find the number of tickets he sold Saturday?

Decompose One Number

You can decompose one number in different ways and subtract the parts.

$$543 - 100 = 443$$

$$443 - 30 = 413$$

$$413 - 3 = 410$$

$$410 - 1 = 409$$

$$543 - 134 = \mathbf{409}$$

Adjust Numbers

You can adjust the numbers to numbers that are easier to work with. Subtract from or add the same amount to both numbers.

$$543 - 134 = ?$$

$$\begin{array}{r} +6 \\ \downarrow \\ 549 \end{array} - \begin{array}{r} +6 \\ \downarrow \\ 140 \end{array} = ?$$

$$549 - 140 = 409$$

Related Addition Equation

You can write an addition equation with an unknown addend to find the difference.

$$543 - 134 = ?$$

$$134 + ? = 543$$

$$543 - 134 = \mathbf{409}$$

$$134 + \mathbf{409} = 543$$

You can use any subtraction strategy to find the difference. You can decide which subtraction strategy is most efficient for you.

Work Together

What strategy might be useful to solve $542 - 118$? Explain your reasoning.

Sample answer: I think decomposing 118 is a useful strategy. It is easier to subtract a number in parts.

On My Own



Name _____

How can you solve each equation?

1. $779 - 363 = \underline{416}$ 2. $562 - 295 = \underline{267}$
3. $934 - 874 = \underline{60}$ 4. $134 - 68 = \underline{66}$

5. At the airport baggage claim, there are 497 passengers and 632 pieces of luggage. How many more pieces of luggage are there than passengers?

135 pieces of luggage

6. Mark and Heidi are asked to solve $171 - 136$. Their work is shown. Which strategy would you choose to solve the problem?

Mark	Heidi
$170 - 135 = ?$	$136 + ? = 171$

Sample answer: I think Heidi's strategy is more efficient because you can count on by 4, then 30, and then 1, to find the difference of 35.

7. Cadence earned 299 points in her online game. This was 102 points greater than her last score. Marco earned 414 points. How many more points did Marco earn?

115 points

How can you solve the equation? Explain your subtraction strategy.

8. $400 - 349 = \underline{51}$ 9. $668 - 218 = \underline{450}$

Sample answer: I used an addition equation and counted on because 349 is close to 340.

Sample answer: I decomposed one number because subtracting the parts made it easier to solve.

10. On her family road trip, Zahara sees a road sign showing how many miles they are from different cities. How much farther is Fairbanks than Cantwell?



145 miles

11. **Error Analysis** Celia says that to subtract $249 - 117$ she can decompose 249 and subtract the parts from 117. Do you agree? Explain your reasoning. **No. Sample answer: Celia should decompose 117 and subtract the parts from 249 because 117 is the number being subtracted.**

12. **Extend Your Thinking** While playing his favorite board game, Armando wins 550 points. He decides to use 335 points to buy game spaces, 122 points on a game piece, and the rest he saves. Does Armando save more than 100 points? Show how you know. **No. Sample answer: $550 - 335 - 122 = 93$; 93 is less than 100.**

Reflect

How do you determine if a subtraction strategy is efficient?

Answers may vary.

Math is... Mindset

How have you worked to accomplish your goal today?

Learn

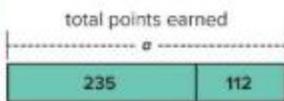
Lea earns 235 points playing her favorite dance video game. She plays the next level and earns 112 more points. Lea needs 475 points to buy a new song for the game.

How many more points does Lea need to buy a new song?

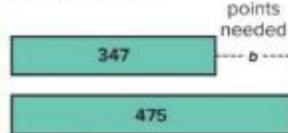
Math is... Modeling

How can you represent this problem in different ways?

Step 1 Determine how many points Lea has earned.



Step 2 Determine how many more points Lea needs.



You can use a letter to represent the unknown.

$$235 + 112 = a$$

$$235 + 112 = 347$$

Lea has 347 points.

$$475 - 347 = b$$

$$475 - 347 = 128$$

Lea needs 128 more points.

You can represent each step in a two-step problem using an equation with a letter for the unknown.

Work Together

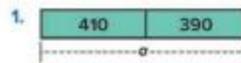
Students collect books to donate to other schools. The first week they collect 348 books. The next week they collect 405 books. They donate 250 books to one nearby school. How can you represent the number of books they have left to donate?

Sample answer: $348 + 405 = c$; $753 - 250 = c$; $753 - 250 = 503$; 503 books

On My Own

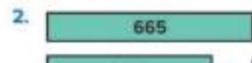
Name _____

How can you write an equation to represent the bar diagram?



Sample answer:

$$410 + 390 = a$$



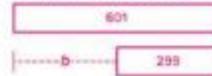
Sample answer:

$$532 + b = 665$$

How can you draw a bar diagram to represent the equation?

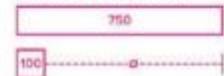
3. $601 - b = 299$

Sample answer:



4. $100 + a = 750$

Sample answer:



Represent and solve the problem. Use letters for the unknowns.

- Sam and Ben take turns driving. They traveled 417 miles in May and 454 miles in June. If Sam drove 502 of the miles, how many miles did Ben drive?
369 miles; Sample answer: $417 + 454 = a$; $871 = a$; $871 - 502 = b$; $369 = b$
- Jaya earned \$187 babysitting. She bought a wireless speaker for \$129 and a carrying case for \$26. How much money does she have left?
\$32; Sample answer: $187 - 129 = f$; $58 = f$; $58 - 26 = g$; $32 = g$
- Judy has 323 beads. Sarah has 142 more beads than Judy. How many beads do they have together?
788 beads; Sample answer: $323 + 142 = x$; $465 = x$; $465 + 323 = y$; $788 = y$

How can you solve for the unknown?

8. $m = 456 - 236$
 $m = \underline{220}$

9. $867 = 235 + k$
 $\underline{632} = k$

10. **STEM Connection** On Monday, Saffron bakes 324 pastries in the morning and some more in the afternoon. She sells 584 pastries. At the end of the day she has 52 pastries left. How many pastries did she bake in the afternoon?

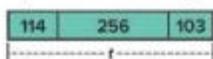
She baked 312 pastries.



11. Elroy's Balloon Emporium sells boxes of balloons. There are 100 balloons in a box. In January, they sell 3 boxes. In February, they sell 6 boxes. If they started with 10 boxes, how many balloons do they have left to sell?

100 balloons

12. **Extend Your Thinking** The bar diagram represents a two-step word problem. Write a two-step word problem that could represent the bar diagram.



Sample answer: Jenna had 114 stickers. Kya gave her 256 more stickers. Then Jenna bought 103 stickers. How many stickers does Jenna have now?

Reflect

How can you make sense of a two-step problem?

Answers may vary.

Math is... Mindset

How do you know that you made good decisions?

Unit Review

Name _____

Vocabulary Review

Choose the correct word to complete each sentence.

compatible number decompose
estimate expanded form
round

- When you **decompose** addends, you break them apart. (Lesson 2-7)
- You can **estimate** an answer when you do not need an exact answer. (Lesson 2-3)
- When you **round** a number, you find a number that is close to the original number. (Lesson 2-2)
- A **compatible number** is a number that is close to a number but is easy to work with. (Lesson 2-3)
- The representation of a number as a sum of the values of each digit is called **expanded form**. (Lesson 2-1)

Review

6. Which is the standard form of three thousand, eight hundred forty? (Lesson 2-1)
- A. 384
 B. 3,408
 C. 3,804
 D. 3,840

7. Circle the choice that correctly shows rounding to the nearest 10. (Lesson 2-2)
- 784 → 785
 563 → 560
 492 → 500
 535 → 530

Complete the following using properties of addition. (Lesson 2-4)

8. $289 + 621 = 621 + \underline{289}$
9. $78 + \underline{418} + 212 = 418 + 212 + 78$

10. Sasha spent 284 minutes swimming the first week and 247 minutes the second week. What is an estimate of the total time Sasha spent swimming? Explain your reasoning. (Lesson 2-3)

Sample answer: I can round 284 to 280 and 247 to 250. I add $280 + 250$ to get the estimate 530.

Will the sum be even or odd? Write even or odd. (Lesson 2-5)

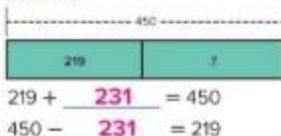
11. The sum of two numbers that are both odd will always be even.
12. The sum of an odd number and an even number will always be odd.
13. Use partial sums to help find the sum. (Lesson 2-6)
 $506 + 472 = \underline{978}$

14. Decompose one number to help find the difference. (Lesson 2-7)
 $367 - 228 = \underline{139}$

15. Gabe is trying to solve $246 + 367$. Which equation shows how he could adjust the addends to find the sum? (Lesson 2-8)

- A. $250 + 360 = ?$
 B. $250 + 370 = ?$
 C. $250 + 363 = ?$
 D. $250 + 371 = ?$

16. Use the bar diagram to help you find the missing number. (Lesson 2-9)



17. Do you think it makes more sense to decompose both addends or adjust both addends to solve $388 + 472$? Explain. (Lesson 2-10)

Sample answer: I would adjust both addends. I would adjust 388 by adding 2 to make 390 and would adjust 472 by subtracting 2 to make 470.

18. Which of the following equations can you use to solve this subtraction equation? (Lesson 2-11)

- $836 - 377 = ?$
- A. $377 + 459 = 836$
 B. $459 - 377 = 836$
 C. $459 - 836 = 377$
 D. $836 + 459 = 377$

19. Enrique read 249 pages of his book in June and 227 pages of his book in July. The book has a total of 638 pages and Enrique wants to know how many pages he has left to read. (Lesson 2-12)

Which set of equations could be used to solve the problem?

- A. $227 + 249 = 476$
 $638 - 227 = 411$
 B. $249 + 277 = 476$
 $638 - 476 = 162$
 C. $638 - 249 = 389$
 $389 + 227 = 616$
 D. $638 - 227 = 411$
 $411 + 249 = 660$

Performance Task

Saffron is helping in a new pastry shop that has been open for two weeks.

Pastry Shop Customers	
Week	Number of Customers
1	324
2	289
3	?

Part A How many total customers did the pastry shop have in Weeks 1 and 2? $324 + 289 = 613$ customers

Part B What is the difference between the number of customers in Weeks 1 and 2? $324 - 289 = 35$ customers

Part C The pastry shop's goal is to have 800 customers within the first 3 weeks. How many customers must visit in Week 3 for the shop to reach the goal?

$324 + 289 = 613$ customers, $800 - 613 = 187$ customers in Week 3 to meet her goal

Part D If the pastry shop has 847 visitors in the first 3 weeks, which week would have more customers: Week 1 or Week 3? How many more?

Week 1 would have more customers, 324 to 234. There were 90 more customers in Week 1.

Reflect

How can you use strategies to add and subtract multi-digit numbers?

Answers may vary.

Fluency Practice

Name _____

Fluency Strategy

You can use a 10 to add or subtract.

Make a 10 to add $49 + 22$.

49 is 1 away from a ten.
Subtract 1 from 22 and add 1 to 49.

$$\begin{array}{r} 49 + 22 = ? \\ \begin{array}{cc} +1 & -1 \\ \downarrow & \downarrow \end{array} \\ 50 + 21 = 71 \end{array}$$

Use a 10 to subtract $75 - 43$.

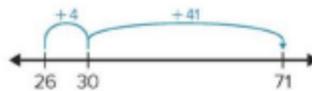
43 is 3 away from a ten.
Subtract 3 from 75 and subtract 3 from 40.

$$\begin{array}{r} 75 - 43 = ? \\ \begin{array}{cc} -3 & -3 \\ \downarrow & \downarrow \end{array} \\ 72 - 40 = 32 \end{array}$$

Fluency Flash

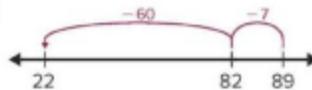
How can you represent the number line with an equation?

1.



$$26 + 45 = 71$$

2.



$$89 - 67 = 22$$

Fluency Check

How can you find the sum or difference?

- | | |
|--------------------------|---------------------------|
| 3. $49 + 16 =$ <u>65</u> | 10. $58 + 2 =$ <u>60</u> |
| 4. $75 + 0 =$ <u>75</u> | 11. $89 - 23 =$ <u>66</u> |
| 5. $76 - 42 =$ <u>34</u> | 12. $19 + 2 =$ <u>21</u> |
| 6. $58 + 37 =$ <u>95</u> | 13. $52 - 1 =$ <u>51</u> |
| 7. $87 - 2 =$ <u>85</u> | 14. $54 - 31 =$ <u>23</u> |
| 8. $29 - 1 =$ <u>28</u> | 15. $17 + 25 =$ <u>42</u> |
| 9. $61 + 0 =$ <u>61</u> | 16. $49 + 48 =$ <u>97</u> |

Fluency Talk

How can you explain how to make 10 to add $28 + 17$?

Sample answer: Since $17 = 2 + 15$, add $28 + 2 = 30$, and then $30 + 15 = 45$.

How is adjusting to make a 10 different when subtracting than when adding?

Sample answer: When adding, you add to one number and subtract from the other. When subtracting, you add to both numbers or subtract from both numbers.

IGNITE!

Name _____

Broken Calculators

Part A: Your calculator can only add 2s and 5s.

How can you make numbers less than 100 with this calculator?

Sample answers: I can make numbers by adding 2s: 2, 4, 6, and so on. I can make numbers by adding 5s: 5, 10, 15, and so on. I can also make numbers by adding 2s and 5s.



Part B: Your calculator can only add 3s and 7s.

What whole numbers less than 12 cannot be made with this calculator?

1, 2, 4, 5, 8, 11

How can you make each of the whole numbers 12 through 16 with this calculator?

Sample answers: $3 + 3 + 3 + 3 = 12$;

$7 + 3 + 3 = 13$; $7 + 7 = 14$;

$3 + 3 + 3 + 3 + 3 = 15$; $3 + 3 + 3 + 7 = 16$

What is the quickest way to make 30 with this calculator? Explain.

Sample answer: 3 groups of 10 makes 30 and $3 + 7 = 10$. Add $3 + 7 + 3 + 7 + 3 + 7$.

Is there a number greater than 11 that cannot be made with this calculator? Explain.

No. 3 and 7 can be used to make all numbers greater than 11.



Learn

How can you represent the number of peaches in the three baskets?



<p>Each basket is one group.</p> <p>Each peach is one object.</p>	<p>Each basket has the same number of peaches.</p> <p>There are 3 equal groups with 5 objects in each group.</p> <p>3 equal groups of 5</p> $3 \times 5 = 15$
---	--

You use **multiplication** to represent equal groups.

Math is... Precision

Why is it important to say *equal groups*?

Work Together

Which show equal groups? Explain how you know.

A	B
C	D

Sample answer: A, B, and C show equal groups because there is the same number of objects in each group.

On My Own

Name _____

How many? Fill in the blanks.

1.



3 equal groups of 4

2.



2 equal groups of 5

How can you represent the equal groups?

3. 2 equal groups of 7

Sample answer: A drawing of 2 circles with 7 objects in each circle.

4. 4 equal groups of 5

Sample answer: A drawing of 4 circles with 5 objects in each circle.

How many objects?

5. 4 equal groups of 4 pencils

$4 \times 4 = \underline{16}$
16 pencils

6. 3 equal groups of 2 mittens

$3 \times 2 = \underline{6}$
6 mittens

What equation represents the equal groups?

7.



$2 \times 3 = 6$

8.



$4 \times 2 = 8$

9. **STEM Connection** Finn has 3 construction sites.

He assigns 8 workers to each site. How many workers does he assign? Explain how you know.

Sample answer: 3 equal groups of 8 equal 24 or $3 \times 8 = 24$. Finn assigns 24 workers.



10. Mateo knows 8 equal groups of 4 objects equal 32 objects. How can he find the total number of objects in 9 equal groups of 4? Explain.

He can add 4 to 32 to find the total number of objects in 9 equal groups of 4 because 9 groups of 4 is just one more group of 4. $9 \times 4 = 36$

11. Nisha will find the total number of markers in the box. She knows there is the same number of markers in each section. How can she find the total?



Sample answer: She can count the number of markers in one section and then multiply that number by the number of sections in the box.

12. **Extend Your Thinking** Tess prepares 5 gift bags for her party. Decide on the equal number of toys that she will place in each bag. How many toys does she need to fill her bags? Explain how you know.

Sample answer: If Tess places 4 toys in each bag, she needs 20 toys. $5 \times 4 = 20$

Reflect

How does multiplication represent equal groups?

Answers may vary.

Math is... Mindset

What have you done to be an active listener today?

Learn

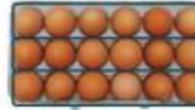
Greta needs 15 eggs.



If she buys this carton of eggs, will she have enough eggs? How do you know?

The eggs are in an **array**. The eggs are in rows. Each row has the same number of eggs.

3 rows



6 eggs in each row

You can use addition.



$$6 + 6 + 6 = 18$$

You can use multiplication.



$$3 \times 6 = 18$$

factors product

Greta has enough eggs.

Arrays have rows of equal groups or columns of equal groups.

Arrays represent multiplication.

Math is... Structure

What is another way to represent 3 groups of 6?

Work Together

How can you draw an array that represents 4 equal groups of 5?

Sample answer: an array with 4 rows of 5 objects

On My Own

Name _____

How many? Complete the equations.



$$4 + 4 + 4 = \underline{12}$$

$$3 \times 4 = \underline{12}$$



$$5 + 5 = \underline{10}$$

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

Write one addition equation. Write one multiplication equation.



$$3 + 3 = 6$$

$$2 \times 3 = 6$$



$$8 + 8 + 8 = 24$$

$$3 \times 8 = 24$$

How can you draw an array to represent the equation?

5. $4 \times 4 = 16$

Sample answer: an array with 4 rows of 4 objects

6. $3 \times 5 = 15$

Sample answer: an array with 3 rows of 5 objects

7. Mauricio planted a garden with 5 rows and 7 plants in each row. How can you represent the total number of plants in his garden? Choose all that apply.

A. $7 + 7 + 7 + 7 + 7$

B. $5 + 5 + 5 + 5 + 5$

C. 5×7

D. 7×5

8. Hyun has a carton of eggs. There are 2 rows of eggs with 6 eggs in each row.

a. Draw an array to represent the problem.

Students should draw an array with 2 rows of 6 objects.

b. Write an equation to represent the problem.

$2 \times 6 = 12$ or $6 + 6 = 12$

c. How many eggs does Hyun have?

12 eggs

9. **Error Analysis** Frankie says she can add $3 + 5$ to find the total number of ice cubes in the tray. Do you agree? Explain.



Sample answer: No. She needs to multiply 3×5 to find the total.

10. **Extend Your Thinking** Mrs. Ruiz is placing 18 chairs in equal rows. What multiplication equations can represent different arrays she can create with the chairs?

Sample answer: $2 \times 9 = 18$ and $9 \times 2 = 18$;

$3 \times 6 = 18$ and $6 \times 3 = 18$

Reflect

How can arrays represent multiplication?

Answers may vary.

Math is... Mindset

What motivated you to do your best work today?

Name _____

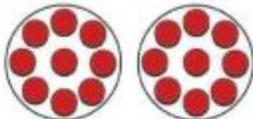
Decide if the example shows a way to think about 3×6 .

Circle Yes or No.

1. $6 + 6 + 6$

Does this show 3×6 ?Yes NoExplain why you chose
Yes or No.**Explanations will vary.**

2.

Does this show 3×6 ?Yes No Explain why you chose
Yes or No.**Explanations will vary.**

3. 3, 6, 9, 12, 15, 18

Does this show 6×3 ?Yes NoExplain why you chose
Yes or No.**Explanations will vary.**Does this show 3×6 ?Yes NoExplain why you chose
Yes or No.**Explanations will vary.**

5. ★ ★ ★ ★ ★

Does this show 3×6 ?Yes No Explain why you chose
Yes or No.**Explanations will vary.****Reflect On Your Learning**I am
confused.I'm still
learning.

I understand.

I can teach
someone else.

Learn

Hector wants to make 12 muffins.

Which tray should he use?



This tray has 3 rows.
Each row has 4 cups.



$$3 \times 4 = 12$$

This tray has 4 rows.
Each row has 3 cups.



$$4 \times 3 = 12$$

Hector can use either tray. The factors and products are the same. The trays can make the same number of muffins.

You can multiply two factors in any order and the product stays the same. This is a property of multiplication.

Math is... Structure

How are 3 groups of 4 and 4 groups of 3 similar?

Work Together

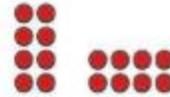
For the bake sale, Tom put 3 muffins each into 7 boxes. Emily put 7 muffins each into 3 boxes. How can you show that Emily has the same number of muffins as Tom?

Sample answer: an array with 3 rows of 7 objects and an array with 7 rows of 3 objects; $3 \times 7 = 21$ and $7 \times 3 = 21$

On My Own

Name _____

1. What two multiplication equations represent these arrays?



$$4 \times 2 = 8 \quad 2 \times 4 = 8$$

2. Sam says that 6×2 and 2×6 have the same product. Do you agree with Sam? Explain why or why not.

Sample answer: Yes. 6 groups of 2 and 2 groups of 6 both equal 12. The order of the factors does not change the product.

What makes the equation true? Fill in the blank.

3. $5 \times 6 = 6 \times$ 5

4. $9 \times 0 =$ 0 $\times 9$

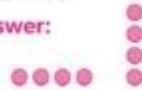
5. Use representations to show 2×3 is equal to 3×2 .

Sample answer:



6. Use representations to show 1×4 is equal to 4×1 .

Sample answer:



7. **STEM Connection** Finn's construction team just finished placing windows in the building. What two multiplication equations can represent the total number of windows in the front of the building?

$$4 \times 5 = 20; 5 \times 4 = 20$$



8. How can you explain whether this statement is true or false?
 $7 \times 2 = 14$, so $14 \times 2 = 7$.

This is false. Sample answer: 14 groups of 2 is not 7.

9. How does knowing the product of 9×6 help you find the product of 6×9 ?
10. Use 3, 30, and 10 to write 2 true multiplication equations.

Sample answer: They both have the same factors, so the product is the same.

Sample answer:
 $3 \times 10 = 30$
 $10 \times 3 = 30$

11. Oliver has 3 sheets of stickers with 4 stickers on each sheet. Sara has 4 sheets of stickers with 3 stickers on each sheet. Who has more stickers? Explain.

Sample answer: They both have the same number because the order of the factors does not change the product.

12. **Extend Your Thinking** Explain how this array represents 9×3 and 3×9 .



Sample answer: There are 3 rows of 9 counters and 9 columns of 3 counters.

Reflect

How does knowing that the order of the factors does not change the product help you multiply?

Answers may vary.

Math is... Mindset

How have you shown that you value the ideas of others?

Learn

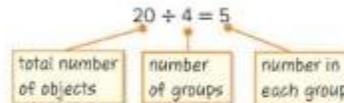
Devian, Hugo, Tanith, and Marcy share 20 grapes.

Can each friend have the same number of grapes?

You equally share by placing the same number of grapes on each plate. There are 5 grapes on each plate.



20 objects shared equally into 4 groups is 5 objects in each group.



The four friends can have the same number of grapes.

When you share equally, you divide to make equal groups.

Division means equal sharing.

Math is... Explaining

How does the division equation represent 4 friends sharing 20 grapes equally?

Work Together

Can 5 friends equally share 24 grapes? Explain how you know.

No. Sample answer: Four friends would each get 5 grapes and one friend would get 4 grapes.

On My Own

Name _____

How can you complete the equation?

1. $12 \div 2 = \underline{\quad 6 \quad}$ 2. $16 \div 4 = \underline{\quad 4 \quad}$



How can you draw a representation for the equation?

Sample answers shown.

3. $18 \div 3 = 6$



4. $21 \div 7 = 3$



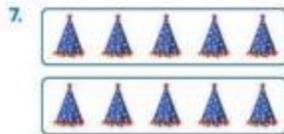
5. $24 \div 3 = 8$



6. $14 \div 2 = 7$



How can you write a division equation for the representation?



$10 \div 2 = 5$



$12 \div 3 = 4$

Draw a representation and write an equation for each situation.

9. There are 25 crackers to be shared equally among 5 bowls.

Sample answer: $25 \div 5 = 5$

10. **STEM Connection** The construction manager equally divides 24 bundles of lumber among 6 carpenters.

Sample answer:



$24 \div 6 = 4$



11. Emma picks 32 peaches. She needs 8 peaches for each batch of jam. If she makes 4 batches, will she have any peaches left over? Justify your answer. **Sample answer:**

No. Emma can divide 32 peaches equally into 4 batches. Each batch will use 8 peaches and no peaches will be left over.

12. **Extend Your Thinking** Ms. Bain has 3 art tables. She shares 27 markers equally among the tables so each student gets 3 markers. How many students sit at each table? Explain how you know. **3 students; Sample answer: $27 \div 3 = 9$, so each table gets 9 markers. If each student at the table gets 3 markers, then 9 markers can be shared equally among 3 students; $9 \div 3 = 3$**

Reflect

How does equal sharing represent division?

Answers may vary.

Math is... Mindset

How did you help in building a safe classroom culture?

Learn

These students will work in groups of 3.

How many groups of 3 will there be?



You can use counters to represent the students.

Put the counters in groups of 3.	There are 7 groups of 3.
Division can represent equal grouping.	
$21 \div 3 = 7$ <div style="display: flex; justify-content: space-around; align-items: center;"> dividend divisor quotient </div>	

Division can mean equal sharing or equal grouping.

Math is... Structure

How is division with equal grouping like division with equal sharing?

Work Together

Only 15 students are in class. Can there be equal groups of 4 students? Draw to explain how you know.

No. Sample answer: One group would have only 3 students.



On My Own

Name _____

How can you draw a representation and answer the question? **See students' drawings.**

- 6 dogs
2 dogs at each water bowl
How many water bowls? **3**
- 8 balloons
2 balloons for each child
How many children? **4**
- 10 plates
5 plates on each table
How many tables? **2**
- 12 beads
4 beads for each bracelet
How many bracelets? **3**

Which division equation describes the representation?

- 5.
- A. $15 \div 3 = 5$
 B. $15 = 3 \div 3$
 C. $15 \div 5 = 5$
 D. $12 \div 5 = 5$

- 6.
- A. $12 \div 4 = 4$
 B. $12 = 3 \div 4$
 C. $12 \div 5 = 4$
 D. $12 \div 3 = 4$

How can you write and solve an equation for the situation?

7. 8 students divided into 4 groups
 $8 \div 4 = 2$

8. 10 players divided into 2 teams
 $10 \div 2 = 5$

Draw a representation for each box listed in the table below. Use your representations to complete the table.

9. The Sun and Shades Company uses 4 different boxes to ship sunglasses to customers.

Name of box	Sunglasses per box	Rows in each box	Sunglasses in each row
Box A	6	3	2
Box B	8	4	2
Box C	12	6	2
Box D	14	7	2

10. The company adds Box E that holds 18 sunglasses. What division equation shows the total number of glasses, the number of rows, and 2 sunglasses in each row? $18 \div 9 = 2$
11. **Error Analysis** James needs to distribute 20 papers. Each student needs 4 papers. James makes 4 piles and places 1 paper in each pile until the paper is gone. How can you explain and correct his mistake? **Sample answer: James needs to make groups of 4 until the paper is gone. He will make 5 piles of paper.**
12. **Extend Your Thinking** Describe a situation that represents $20 \div 5 = 4$. **Sample answer: There are 20 chairs divided into 5 rows with 4 chairs in each row.**

Reflect

How is division with equal grouping different than division with equal sharing?

Answers may vary.

Math is... Mindset

How did you use your abilities and skills to be successful today?

Learn

Kiko states that she can represent both multiplication and division with one model.

How can she create a model with her counters that shows both multiplication and division?

Math is... Explaining

Why can one model represent both multiplication and division?

One Way Arrays

3 groups of 2 = 6



$$3 \times 2 = 6$$

6 divided by 3 = 2



$$6 \div 3 = 2$$

Another Way Equal Groups

2 groups of 3 = 6



$$2 \times 3 = 6$$

6 divided by 2 = 3



$$6 \div 2 = 3$$

Arrays and equal groups represent both multiplication and division. Multiplication and division are related.

Work Together

How can you draw to represent $5 \times 3 = 15$ and $15 \div 5 = 3$?

Sample answer: an array with 5 rows of 3 objects

On My Own



Name _____

How can you draw an array to represent the situation?

- | | |
|---|--|
| <p>1. 4 groups of 2 = 8
8 divided by 4 = 2
an array with 4 rows of 2 objects</p> | <p>2. $2 \times 8 = 16$
$16 \div 2 = 8$
an array with 2 rows of 8 objects</p> |
|---|--|

How can you draw an equal group to represent the situation?

- | | |
|--|---|
| <p>3. 4 groups of 3 = 12
12 divided by 4 = 3
a drawing of 4 groups with 3 objects in each group</p> | <p>4. $3 \times 5 = 15$
$15 \div 3 = 5$
a drawing of 3 groups with 5 objects in each group</p> |
|--|---|

How can you write a division equation for the representation?

- | | |
|---|---|
| <p>5. 
$2 \times 5 = 10$
$10 \div 2 = 5$</p> | <p>6. 
$3 \times 6 = 18$
$18 \div 3 = 6$</p> |
|---|---|

7. Jason says that because he knows $6 \times 2 = 12$, he also knows a related division equation. Explain why you agree or disagree. **Sample answer: I agree because division is related to multiplication. $12 \div 6 = 2$ is related to $6 \times 2 = 12$ and $2 \times 6 = 12$.**

Write a multiplication and a division equation to represent each model.

- | | |
|--|---|
| <p>8. 
$5 \times 4 = 20$
$20 \div 5 = 4$</p> | <p>9. 
$7 \times 3 = 21$
$21 \div 7 = 3$</p> |
|--|---|

10. **STEM Connection** Finn has 245 days to complete 3 parts of a construction project. He wants to spend the same number of days on each part. How can you write a multiplication and a division equation to represent the problem? Use a ? for the unknown.



$245 \div 3 = ?$; $3 \times ? = 245$

11. How can 9 pairs of shoes represent a multiplication and a division equation? **Sample answer: 9 pairs of shoes show 9 equal groups of 2, or $9 \times 2 = 18$. 18 shoes divided into 9 groups of 2 is $18 \div 9 = 2$.**
12. **Extend Your Thinking** Mr. Mack gives 3 pencils to each of his students. He had 24 pencils. How can you use the multiplication equation $8 \times 3 = 24$ to find how many students he has in class? **Sample answer: $8 \times 3 = 24$ is related to $24 \div 8 = 3$ because both equations describe 8 groups of 3.**

Reflect

How are multiplication and division related?

Answers may vary.

Math is... Mindset

How did organizing your work help you today?

Learn

Oliver has 24 shirts in his dresser drawers. There are the same number of shirts in each drawer.



What questions might you ask?

Group Size Unknown

Oliver has 24 shirts in 4 dresser drawers.

How many shirts are in each drawer?



$$24 \div 4 = \square$$

$$4 \times \square = 24$$

6 shirts

Number of Groups Unknown

Oliver has 24 shirts in dresser drawers. There are 6 shirts in each drawer.

How many drawers are filled with shirts?



$$24 \div \square = 6$$

$$\square \times 6 = 24$$

4 drawers

You can use equal groups or arrays to find the unknown.

Math is... Explaining

How can you use representations to find the unknown in multiplication and division problems?

Work Together

Ricardo needs 6 pens. Pens are sold in packs of 2. How can you use a representation and an equation to determine how many packs Ricardo needs to buy?

Sample answer:



$$? \times 2 = 6 \text{ or } 6 \div 2 = ?$$

3 packs

On My Own

Name _____

Use the representation. What is the unknown?

1. $4 \times \underline{3} = 12$



2. $\underline{3} \times 7 = 21$



3. Robert has 16 pencils. He puts an equal number of pencils in 2 boxes. How many pencils does he put in each box?



$$16 \div 2 = \underline{8}$$

$$2 \times \underline{8} = 16$$

How can you draw a representation to find the unknown?

4. $4 \div 2 = \underline{2}$

Sample answer: a drawing of 2 equal groups of 2

5. $6 \times \underline{3} = 18$

Sample answer: an array with 6 rows of 3

6. $18 \div 2 = \underline{9}$

Sample answer: an array with 2 rows of 9

7. $\underline{3} \times 3 = \underline{9}$

Sample answer: a drawing of 3 equal groups of 3

8. Lauren and Miguel make 20 paper snowflakes. If they make the same number of snowflakes, how many do Lauren and Miguel each make?

10 snowflakes; Sample answer: a drawing of 2 equal groups of 10; $2 \times ? = 20$; $20 \div 2 = ?$; $2 \times 10 = 20$

9. Calvin has 15 books. He places an equal number of books on a bookshelf with 3 shelves. How many books are on each shelf?

5 books; Sample answer: an array with 3 rows of 5; $15 \div 3 = ?$

10. There are 36 photos in a photo book. There are 6 photos on each page. Rocio says she can count the number of 6s it takes to equal 36 to find the number of pages. Do you agree? Explain your reasoning. **Sample answer: Yes. You can find the number of groups of 6 in 36 by skip counting or adding on.**

11. **Error Analysis** Liam and Ava need to find the number to make this equation true. Liam says it is 16. Ava says it is 4. Who do you agree with? Draw a picture to support your answer.

$8 = 2 \times \square$

Ava; Sample answer: I can draw 2 groups. There are 4 objects in each group.



12. **Extend Your Thinking** Charles writes the equation $? \div 5 = 10$. Explain how he might use the known numbers in the equation to solve for the unknown.

Sample answer: The equation represents 5 groups and 10 objects in each group. Or the equation represents 10 groups and 5 objects in each group. Charles can use $10 \times 5 = 50$ to solve.

Reflect

How can you find the unknown in a word problem?

Answers may vary.

Math is... Mindset

What helped you make sense of a situation today?

Unit Review

Name _____

Vocabulary Review

Use the vocabulary to complete each sentence.

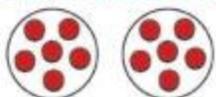
division	equal groups
factors	multiplication
product	quotient

1. You use **multiplication** to find the product of two or more numbers. (Lesson 3-1)
2. When you share objects equally among groups, you use **division** to determine the number of objects in each group. (Lesson 3-4)
3. Groups that have the same number of objects are called **equal groups**. (Lesson 3-1)
4. A multiplication equation always has two or more **factors**. (Lesson 3-2)
5. The **product** is the answer to a multiplication equation. (Lesson 3-2)
6. The **quotient** is the answer to a division equation. (Lesson 3-5)

Review

7. How can you represent these groups of counters? (Lesson 3-1)

Sample answer shown.



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

8. How can you complete the equations? (Lesson 3-3)

$$5 \times \underline{7} = 35$$

$$7 \times \underline{5} = 35$$

9. What number makes the equation true? (Lesson 3-7)

$$2 \times ? = 16$$

A. 7

B. 8

C. 9

D. 10

10. What equation represents the stars shown? (Lesson 3-2)

Sample answer shown.



$$\underline{3} \times \underline{5} = \underline{15}$$

11. Which equation represents this model? Choose all that apply. (Lesson 3-6)

(Lesson 3-6)



A. $4 \times 8 = 32$

B. $36 \div 4 = 9$

C. $4 \times 9 = 36$

D. $9 \div 4 = 36$

12. Clara has 20 glue bottles to place at 5 tables. She will place the same number of bottles on each table.

Which equation represents the problem? (Lesson 3-4)

A. $5 \div 4 = 20$

B. $5 \div 20 = 4$

C. $4 \div 5 = 20$

D. $20 \div 5 = 4$

13. Mason will place 18 pennies into jars. He will place 9 pennies in each jar.



What equation represents the problem? (Lesson 3-3)

$$\underline{18} \div \underline{9} = \underline{2}$$

Sample answer shown.

14. Sophia will buy 6 tomato plants. The plants cost \$5 each. How much money does Sophia need to buy the plants? (Lesson 3-1)

$$\underline{\$ 30}$$

15. Victor has 16 ice cubes. He wants to place 4 ice cubes in each glass of water. How many glasses will he need? (Lesson 3-5)

A. 4

B. 5

C. 6

D. 7

16. Jane has a total of 54 seeds in 6 packets. Each packet has the same number of seeds.

Which equations represent the problem? Choose all that apply. (Lesson 3-7)

(Lesson 3-7)

A. $54 \div 6 = ?$

B. $6 \div 54 = ?$

C. $54 \times 6 = ?$

D. $6 \times ? = 54$

17. Lola places cards in 4 rows of 6. How many cards does she use? (Lesson 3-2)

$$\underline{24} \text{ cards}$$

18. At recess, 28 students make 4 teams to play a game. What equation represents the number of students on each team? (Lesson 3-4)

$$\underline{28} \div \underline{4} = \underline{7}$$

Sample answer shown.

6. Polly places some oranges into 3 rows. There are 8 oranges in each row. Which equation correctly represents the total number of oranges?
- A. $3 + 8 = 11$
B. $8 + 8 + 8 = 24$
 C. $3 + 8 + 3 + 8 + 3 + 8 = 33$
 D. $3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 21$

7. In which pattern would the next number be 20? Choose all that apply.
- A. 12, 13, 14, 15, ___
B. 12, 14, 16, 18, ___
 C. 9, 12, 15, 18, ___
D. 0, 5, 10, 15, ___

8. Mia wrote the equation $4 + 4 + 4 = 12$ to represent the total counters in an array. Which of the following correctly represents the array?

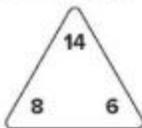
- A. 3 rows of 4 columns**
 B. 2 rows of 6 columns
 C. 4 rows of 2 columns
 D. 12 rows of 4 columns

9. Which correctly shows how to skip count by 5s?

- A. 5, 10, 20, 25, 30...
 B. 5, 10, 15, 25, 35...
 C. 5, 10, 15, 25, 30...
D. 5, 10, 15, 20, 25...

10. Which equations could be used to show the relationship among the numbers in the given fact triangle? Choose all that apply.

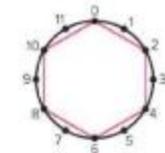
- A. $14 - 8 = 6$**
 B. $8 - 14 = 6$
 C. $14 + 6 = 20$
D. $8 + 6 = 14$



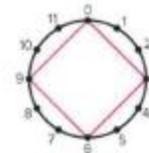
Name _____

Skip Counting into Shapes

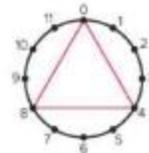
Draw line segments to connect the points as you skip count.



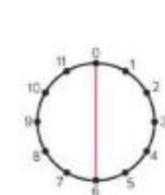
- a. Count by 2s:
0, 2, 4, ...



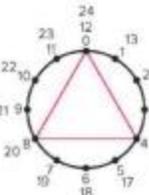
- b. Count by 3s:
0, 3, 6, ...



- c. Count by 4s:
0, 4, 8, ...



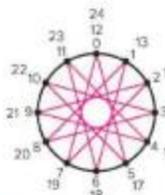
- d. Count by 6s.



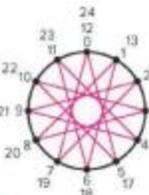
- e. Count by 8s.



- f. Count by 9s.



- g. Count by 5s.



- h. Count by 7s.

Learn

Melanie will double the salsa recipe.

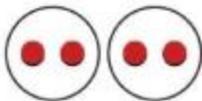
How can you determine how much of each ingredient she needs?

Salsa recipe

- 1 onion
- 2 cloves of garlic
- 3 wedges of lime
- 4 peppers
- 5 tomatoes

One Way You can represent each ingredient with counters and double the amount.

2 groups of 2 cloves of garlic



Another Way Multiply each ingredient by 2. Use a multiplication fact table to determine multiples of 2.

X	0	1	2	3	4	5
0	0	0	0	0	0	0
1	0	1	2	3	4	5
2	0	2	4	6	8	10
3	0	3	6	9	12	15
4	0	4	8	12	16	20
5	0	5	10	15	20	25

There is a pattern with multiples of 2.

$1 \times 2 = 2$ $2 \times 2 = 4$ $3 \times 2 = 6$ $4 \times 2 = 8$ $5 \times 2 = 10$

Multiplying by 2 is the same as doubling.

The multiples of 2 always have a 0, 2, 4, 6, or 8 in the ones place.

Math is... Connections

How is multiplying by 2 related to doubling?

Work Together

Melanie packs 1 yogurt, 7 baby carrots, and 9 grapes. She packs the same lunch for her brother. How can you find the number of each item she needs to pack 2 lunches? **Multiply each number by 2: 2 yogurts, 14 baby carrots, and 18 grapes.**

On My Own

Name _____

1. Byron is making loaves of bread. He uses 2 cups of flour for each loaf. Complete the table to show how many cups of flour he needs for each number of loaves.

Loaves of Bread	Cups of Flour
5	10
6	12
7	14

2. Arya is buying balloons for her two brothers. She wants to give them both the same number of balloons. How can you write an equation to represent the total number of balloons Arya might buy?

Sample answer: $2 \times 9 = 18$. If Arya buys both of her brothers 9 balloons each, she buys 18 balloons in all.

3. Peter is cooking potatoes in a large pot. The recipe calls for 2 minutes of boiling for every pound of potatoes. How many minutes will it take Peter to cook 8 pounds of potatoes?

16 minutes

4. Draw a line to connect the related equations:

$2 \times ? = 4$ $7 + 7 = ?$
 $2 \times ? = 10$ $2 + 2 = ?$
 $2 \times ? = 14$ $5 + 5 = ?$

How can you complete the equation?

5. $2 \times 9 = \underline{18}$

6. $\underline{20} = 2 \times 10$

7. $6 \times 2 = \underline{12}$

8. $8 = \underline{4} \times 2$

9. $\underline{3} \times 2 = 6$

10. $7 \times 2 = \underline{14}$

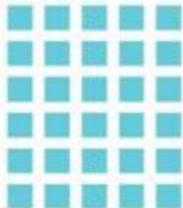
Learn

Ryo puts photos in an album.
He puts 5 photos on each page.

How can you determine the number of photos he uses to fill 3, 4, 5, and 6 pages?



One Way You can use an array to represent the problem. **Skip count** by 5s to find multiples of 5.



5, 10, 15, 20, 25, 30
6 rows of 5 equal 30

Another Way You can multiply each number by 5. Use a multiplication fact table to find the products.

\times	0	1	2	3	4	5	6
0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6
2	0	2	4	6	8	10	12
3	0	3	6	9	12	15	18
4	0	4	8	12	16	20	24
5	0	5	10	15	20	25	30
6	0	6	12	18	24	30	36

$$3 \times 5 = 15 \quad 4 \times 5 = 20$$
$$5 \times 5 = 25 \quad 6 \times 5 = 30$$

Math is... Modeling
How does the array represent the problem?

There is a pattern with multiples of 5.
Multiples of 5 have a 0 or 5 in the ones place.

Work Together

Cho is giving each of her friends 5 trading cards. What do you know about the total number of cards Cho will give away?

Sample answer: The total number of cards will have a 0 or 5 in the ones place.

On My Own

Name _____

How can you use what you know about multiplication with 5 to answer the question?

1. What can you say about the products of $\times 5$ facts?

Sample answer: Multiples of 5 have 0 or 5 in the ones place. If the other factor is even, the product is even. If the other factor is odd, the product is odd.

2. Sheila says that knowing 3×5 can help you remember 5×3 . Is she correct? Explain.

Sample answer: 3×5 and 5×3 have the same product, 15. Changing the order of the factors does not change the product.

3. Marcel is decorating a poster with stickers. He arranges the stickers into 5 rows. Each row has the same number of stickers. How many stickers might Marcel have in all?

Sample answer: Marcel could have 40 stickers if he places 8 stickers in each row.

How can you complete the equation?

4. $5 \times 9 = \underline{45}$ 5. $\underline{35} = 5 \times 7$
6. $6 \times 5 = \underline{30}$ 7. $25 = 5 \times \underline{5}$
8. $10 \times 5 = \underline{50}$ 9. $3 \times 5 = \underline{15}$
10. $\underline{2} \times 5 = 10$ 11. $8 \times 5 = \underline{40}$

12. Mary Lou does 5 jumping jacks. If she does the same number of jumping jacks for 4 days in a row, how many jumping jacks does Mary Lou do?

20 jumping jacks

13. Sara puts the same number of fish shown in each of 5 tanks. How many fish does she have?

35 fish



14. Which equations are true? Choose all that apply.

- A. $5 \times 3 = 3 + 3 + 3$ **B.** $3 \times 5 = 5 + 5 + 5$
 C. $5 \times 2 = 5 + 2$ **D.** $5 \times 4 = 4 + 4 + 4 + 4 + 4$

15. **Extend Your Thinking** Lee has 32 books. He says he can make 5 stacks of books with the same number of books in each stack. Is he correct? Explain. **No. Sample answer: Since 32 does not have a 0 or a 5 in the ones place, it cannot be a multiple of 5.**

Reflect

What patterns can you use to recall multiplication facts with 5? Explain.

Answers may vary.

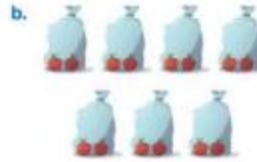
Math is... Mindset

What steps did you take to focus on your work today?

Name _____

Consider the equation $2 \times 7 = 14$.

1. Circle *all* drawings that show 2 groups of 7.

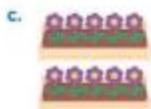


Explain or show your thinking.

Explanations may vary.

Consider the equation $5 \times 2 = 10$.

2. Circle *all* drawings that show 5 groups of 2.



Explain or show your thinking.

Explanations may vary.

Learn

Joon has a collection of dimes.

How can you find the value of Joon's dimes?



► **One Way** You can skip count by 10s to find the value in cents of different numbers of dimes.



► **Another Way** Multiply 10 by the number of dimes. Use a multiplication fact table to find the product.

$$1 \times 10 = 10 \quad 6 \times 10 = 60$$

$$2 \times 10 = 20 \quad 7 \times 10 = 70$$

$$3 \times 10 = 30 \quad 8 \times 10 = 80$$

$$4 \times 10 = 40 \quad 9 \times 10 = 90$$

$$5 \times 10 = 50 \quad 10 \times 10 = 100$$

\times	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

When you multiply 10 by a digit, the product has the same digit in the tens place and a 0 in the ones place.

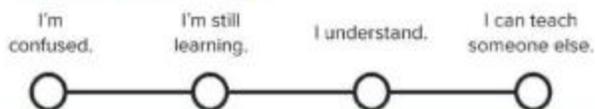
Math is... Structure

How can you use the multiplication fact table to skip count by 10?

Work Together

Cornell says he knows the product of 8×10 is 80 without skip counting or multiplying. What pattern might have helped Cornell find the product? **Sample answer: When you multiply 10 by a digit, the product has the same digit in the tens place and a 0 in the ones place. 80 has 8 in the tens place and 0 in the ones place.**

Reflect On Your Learning



On My Own



Name _____

How can you use what you know about multiplication with 10 to answer the question?

1. What do you know about products of multiplication facts with a factor of 10? **Sample answer: Multiples of 10 have a 0 in the ones place.**

2. Paolo has a pile of dimes. Can the value of the dimes be 58¢? Explain. **No. Sample answer: Since dimes are worth 10¢, the value must have a 0 in the ones place.**

3. **STEM Connection** Grace needs to write 10 lines of code for her character to complete one action. How many lines of code does she need to write for her character to complete 7 actions?

70 lines of code



4. Janelle is arranging her rock collection. She arranges the rocks into rows as shown. She has fewer than 11 rows. How many rocks might Janelle have in all?



Sample answer: 70 rocks; if she has 7 rows, she would have 7 rows of 10.

How can you complete the equation?

5. $5 \times 10 = \underline{50}$

6. $10 \times \underline{7} = 70$

7. $\underline{60} = 6 \times 10$

8. $\underline{20} = 10 \times 2$

9. $\underline{9} \times 10 = 90$

10. $8 \times 10 = \underline{80}$

11. There are 3 logs in the pond. There are 10 frogs on each log. How many frogs are there?

30 frogs

12. Larry walks 5 miles in a week. He walks the same number of miles for 10 weeks. How many miles does Larry walk?

50 miles

13. Which equations are true? Circle all that are correct.

A. $5 \times 8 = 4 \times 10$

B. $3 \times 5 = 3 \times 10$

C. $10 + 10 = 10 \times 10$

D. $10 + 10 = 2 \times 10$

14. **Extend Your Thinking** How does knowing 5×4 help you remember 10×4 ?

Sample answer: I can double the product in a $\times 5$ equation to find the product in a $\times 10$ equation. $5 \times 4 = 20$, and I can double 20 to find $10 \times 4 = 40$.

Reflect

What patterns can you use to recall multiplication facts with 10? Explain.

Answers may vary.

Math is... Mindset

How were you flexible in your thinking to help you make good decisions?

Learn

Quinn has two pencil cases. In each case is one pencil.



How many pencils are in the two pencil cases?

Multiply to find the number of pencils in two pencil cases.



2 cases each with 1 pencil

$$2 \times 1 = 2$$

2 pencils

Multiply to find the number of pencils in two pencil cases.



2 cases each with 0 pencils

$$2 \times 0 = 0$$

0 pencils

There are patterns with multiples of 1 and 0.

$$3 \times 1 = 3 \quad 4 \times 1 = 4 \quad 5 \times 1 = 5 \quad 6 \times 1 = 6$$

$$3 \times 0 = 0 \quad 4 \times 0 = 0 \quad 5 \times 0 = 0 \quad 6 \times 0 = 0$$

Any number multiplied by 1 equals itself.

Any number multiplied by 0 equals 0.

Math is... Explaining

How is 2×1 related to 1×2 ?

Work Together

There are 3 blue eggs, 2 white eggs, 1 spotted egg, and 0 brown eggs in each nest. How many of each type of egg are in 4 nests?

Sample answer: There are $3 \times 4 = 12$, 12 blue eggs; $2 \times 4 = 8$, 8 white eggs; $1 \times 4 = 4$, 4 spotted eggs; $0 \times 4 = 0$, 0 brown eggs.

On My Own

Name _____

How can you complete the equation?

1. $7 \times 1 = \underline{7}$

2. $0 = \underline{0} \times 1$

3. $4 \times \underline{0} = 0$

4. $\underline{1} \times 1 = 1$

5. $0 \times 6 = \underline{0}$

6. $8 = 1 \times \underline{8}$

7. Kelly and Yusif want to share a box of crackers. They open the box and share all of the crackers in the box. They each get 0 crackers. How many crackers were in the box?

0 crackers

8. Eli checks out some books from the library. He reads 1 book per day. How many days will it take Eli to read all his books?

Sample answer: If Eli checks out 8 books and reads 1 book per day, it will take him 8 days to read all 8 books.

9. Carter starts playing a new game. He completes 0 levels per day for a week. How many levels will Carter complete by the end of the week? **Sample answer:** 0 levels per day \times 7 days = 0 levels. Carter completes 0 levels in a week.

10. Mr. Mustafa buys 1 jersey for each player on his daughter's team. There are 9 players. How can you write an equation to find the number of jerseys he buys?

Sample answer: $9 \times 1 = 9$; 9 jerseys

11. There are 3 bins. Each bin has 1 book. How can you write an equation to show the number of books there are?

Sample answer: $3 \times 1 = 3$; 3 books

12. Which equations are true? Circle all that are correct.

A. $6 \times 0 = 6$

B. $8 \times 1 = 2 \times 4$

C. $0 \times 3 = 9 \times 0$

D. $1 \times 10 = 5 \times 1$

13. **Error Analysis** Elijah says that multiplying 4 by 0 is like adding 0 to 4. His work is shown. Do you agree? Explain.



No. Sample answer: When you multiply by 0, the product is always 0.

14. **Extend Your Thinking** Does the equation $1 \times 0 = ?$ follow the pattern of multiples of 0, multiples of 1, or both? Justify your reasoning.

Sample answer: Both; $1 \times 0 = 0$; The product of 0 and any factor is 0. The product of 1 and any factor is the other factor, which is 0 in this equation.

Reflect

What patterns can you use to recall multiplication facts with 1 and 0? Explain.

Answers may vary.

Math is... Mindset

How did a different perspective help you with your work today?

Learn

Zion fills each of 4 gift bags with 10 stickers, 2 cars, 5 sticky hands, and 1 bottle of bubbles. He puts 0 stamps in the gift bags.



How can he use patterns to determine the number of each type of toy he needs?

When you multiply a digit by 10, the product has the same digit in the tens place and a 0 in the ones place.

$4 \times 10 = 40$ 40 stickers

Math is... Patterns

How are multiplying with 2 and multiplying with 10 the same? How are they different?

Multiples of 2 have a 0, 2, 4, 6, or 8 in the ones place.

$4 \times 2 = 8$ 8 cars



Multiples of 5 have a 0 or 5 in the ones place.

$4 \times 5 = 20$ 20 sticky hands



The product of any number and 0 is 0.

$4 \times 0 = 0$ 0 stamps



The product of any number and 1 is itself.

$4 \times 1 = 4$ 4 bottles of bubbles



You can use patterns to help recall facts with factors 0, 1, 2, 5, and 10.

Work Together

Dina arranges her stickers into 10 equal rows. Each row has fewer than 7 stickers. How many stickers might Dina have in all?

Sample answer: Dina might have 0, 10, 20, 30, 40, 50, or 60 stickers.

On My Own



Name _____

How can you use what you know about multiplication to answer the question?

- Multiples of 2 and 10 are always even.
- Multiples of 10 always have a 0 in the ones place.
- The product of any number and 1 is itself.
- The product of any number and 0 is always 0.

How can you complete the equation?

- $5 \times 3 = \underline{15}$
- $2 \times 7 = \underline{14}$
- $\underline{0} \times 8 = 0$
- $\underline{40} = 10 \times 4$
- $\underline{30} = 5 \times 6$
- $9 \times \underline{1} = 9$

11. Felix has fewer than 10 nickels in his piggy bank. How many cents might he have? Explain how you know. **Sample answer:** Felix could have up to 9 nickels, so he could have 5, 10, 15, 20, 25, 30, 35, 40, or 45 cents.

12. The Lee family buys pairs of mittens for their vacation. Can the Lee family buy 17 mittens in all? Explain. **No. Sample answer:** The total number of mittens must be even. 2 mittens are in a pair, and multiples of 2 are even.

Unit 4 • Use Patterns to Multiply by 0, 1, 2, 5, and 10 149

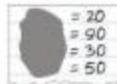
13. Marcel is placing cards in an array. He places the cards into some rows of 5. How many cards might Marcel have in all?

Sample answer: Marcel might have 40 cards if he has 8 rows of 5.

14. **Error Analysis** Kayla thinks of a number. She tells her friend it is an odd number, a product of 5, and a product of 10. Her friend says that isn't possible. Who is correct? Explain.

Sample answer: Her friend is correct. All products of 10 are even numbers.

15. **Extend Your Thinking** Setsuko spills her drink on her homework and can only see the answers. What multiplication facts could she have been practicing? Explain.



Sample answer: She could have been practicing her 2s, 5s, and/or 10s facts. The products match the patterns for all 3 factors.

Reflect

How can you describe the patterns when multiplying by 0, 1, 2, 5, or 10?

Answers may vary.

Math Is... Mindset

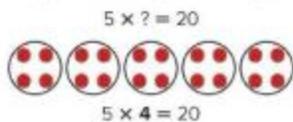
How have you helped to build a relationship with a classmate today?

Learn

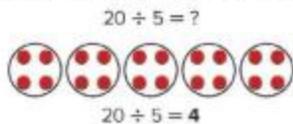
There are 20 children in 5 equal groups on the sky ride.

How many children are in each group?

► **One Way** Use multiplication to represent the problem.



► **Another Way** Use division to represent the problem.



There are 4 children in each group.

You can use a multiplication equation or a division equation to represent and solve problems involving equal groups.

Math is... Patterns

How can you use multiplication patterns to check that your solution is correct?

Work Together

Ten more children join the group. How can you find the number of children in each of the five carts on the sky ride if there are the same number of children in each cart?

Sample answer: $20 + 10 = 30$; $30 \div 5 = ?$;
Use counters to make 5 equal groups of 6.
There are 6 children in each cart.

On My Own

Name _____

How can you write a multiplication and division equation for the problem? Write a ? for the unknown.

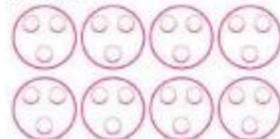
- Eight friends share 40 apple slices. If each friend receives the same amount of apple slices, how many does each person receive?
 $8 \times ? = 40$ and $40 \div 8 = ?$
- Bobbie, Wendy, and Winston spent a total of \$21 to go to the movies. If it cost each person the same amount, how much did each person spend?
 $3 \times ? = 21$ and $21 \div 3 = ?$
- Jermaine ran 56 minutes over seven days. If he ran the same amount of time each day, how many minutes did he run each day?
 $7 \times ? = 56$ and $56 \div 7 = ?$
- June earns \$25 for working five hours. If she earns the same amount each hour, how much does she get paid per hour?
 $5 \times ? = 25$ and $25 \div 5 = ?$

How can you draw a representation for the set of equations?

5. $6 \times ? = 18$
 $18 \div 6 = ?$



6. $8 \times ? = 24$
 $24 \div 8 = ?$



7. $9 \times ? = 36$
 $36 \div 9 = ?$



8. $3 \times ? = 21$
 $21 \div 3 = ?$



9. Sam bought tickets to the county fair. How much did each ticket cost if each costs the same amount? **\$6**



10. Carlos spends 35 minutes on homework. He spends the same amount of time on each of his 5 assignments. How long does he spend on each assignment? **7 minutes**

11. **STEM Connection** It takes Grace 24 hours to write a computer program for 4 robots. If each program takes the same amount of time to write, how long does it take Grace to write one program? Explain.



6 hours; Sample answer: 24 hours divided into 4 equal groups is 6 hours in each group. $24 \div 4 = 6$

12. **Extend Your Thinking** Describe a situation that could be represented by the equations $4 \times ? = 12$ and $12 \div 4 = ?$. Then solve.

Sample answer: There are 12 seats on the roller coaster. There are 4 rows of the same number of seats. How many seats are in each row? $4 \times 3 = 12$ and $12 \div 4 = 3$

Reflect

How can you solve word problems involving equal groups?

Answers may vary.

Math is... Mindset

How was it useful to consider different possible solutions to a problem?

Unit Review Name _____

Vocabulary Review

Choose the correct word to complete each sentence.

product	pattern
multiplication fact table	unknown
skip count	equal groups

- Groups that have the same number of objects are referred to as **equal groups**. (Lesson 4-6)
- A **multiplication fact table** is a tool that shows you the products for pairs of numbers. (Lesson 4-7)
- The **product** is the answer to a multiplication equation. (Lesson 4-8)
- You can find a **pattern** by looking for a rule that relates numbers to each other. (Lesson 4-2)
- When you solve an equation, you find the value of the **unknown**. (Lesson 4-6)

Review

6. Write *true* or *false*.
When a whole number is multiplied by 10, the product will always have a 0 in the ones place. (Lesson 4-3)
true
7. David uses pennies to make an array with 2 rows and 5 columns. How many pennies does David use to make his array? (Lesson 4-1)
A. 5
B. 7
C. 10
D. 25
8. Aya has 2 equal groups of tokens. There are 16 tokens in all. How many tokens are in each group? (Lesson 4-6)
A. 7
B. 8
C. 9
D. 16
9. Each book at the book fair was on sale for \$5. Dvora bought 9 books. How much did she spend on books at the book fair? (Lesson 4-2)
A. \$30
B. \$35
C. \$40
D. \$45
10. Jake collects 10 trading cards each week. If he collects 10 cards for 6 weeks, how many cards will Jake collect? (Lesson 4-3)
The equation $\underline{6} \times 10 = ?$ can be used to show that Jake will collect 60 cards.
11. Archer spends \$35 on computer games. Each game costs \$5. How many computer games does Archer buy? (Lesson 4-2)
Archer buys 7 computer games.
12. John found 4 dimes. How much money does John have? (Lesson 4-3)
A. 14¢
B. 20¢
C. 40¢
D. 4¢
13. Greg read 60 books during the past 10 months. If he read the same number of books every month, how many books did Greg read each month? (Lesson 4-6)
A. 5
B. 6
C. 50
D. 600
14. Lydia is buying packs of books for 6 cousins. Each pack has several books and Lydia buys each cousin 1 pack. How many packs of books does Lydia buy? (Lesson 4-4)
A. 1
B. 7
C. 6
D. 3
15. Kyndall places 28 pieces of construction paper into 1 basket. How many pieces of construction paper are in each basket? (Lesson 4-4)
A. 14
B. 28
C. 7
D. 4
16. Travis is on a road trip and drives 60 miles in one hour. How far can Travis drive in 0 hours? (Lesson 4-6)
Travis can drive 0 miles in 0 hours.
17. Hannah has 15 trading cards and 0 photographs. She wants to divide them equally onto each of 5 pages of her binder. How many trading cards and photographs will be on each page? (Lesson 4-6)
3 trading cards
0 photographs

Performance Task

Grace needs to write 30 lines of code for a computer program.

Part A If she writes the same number of lines of code each day, could Grace write the code in 5 days? Explain.

Yes. Sample answer: $5 \times 6 = 30$; Grace can finish writing the code in 6 days.

Part B Grace tries to speed up her work and write 10 lines of code per day. But every day she ends up with 3 lines of code that is not usable. How long would it take her to finish writing the code for her program at this pace? Show your work.

5 days; Sample answer: $10 - 3 = 7$. So, Grace writes 7 lines of usable code each day. I know that $4 \times 7 = 28$ and $5 \times 7 = 35$. So, Grace will finish writing the code in 5 days.

Reflect

How can you use patterns to multiply numbers by 0, 1, 2, 5, and 10?

Answers may vary.

Unit 4

Fluency Practice

Name _____

Fluency Strategy

You can decompose one number by place value to subtract.

	Decompose
Decompose 39.	$97 - 39 = ?$
Subtract the tens.	$97 - 30 = 67$
Subtract the ones.	$67 - 9 = 58$
	$97 - 39 = 58$

1. How can you decompose to find the difference?

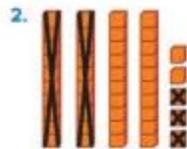
$$49 - 28 = ?$$

$$49 - \underline{20} = 29$$

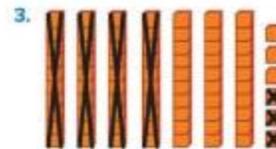
$$29 - \underline{8} = \underline{21}$$

Fluency Flash

How can you write an equation to represent the base-ten blocks?



$$45 - 23 = 22$$



$$76 - 43 = 33$$

Fluency Check

How can you find the sum or difference?

- | | |
|--------------------------|---------------------------|
| 4. $58 - 35 =$ <u>23</u> | 9. $86 - 32 =$ <u>54</u> |
| 5. $68 - 47 =$ <u>21</u> | 10. $32 + 29 =$ <u>61</u> |
| 6. $55 - 23 =$ <u>32</u> | 11. $24 + 66 =$ <u>90</u> |
| 7. $38 + 17 =$ <u>55</u> | 12. $48 - 27 =$ <u>21</u> |
| 8. $87 - 52 =$ <u>35</u> | 13. $37 + 39 =$ <u>76</u> |

Fluency Talk

Why would you choose to decompose a number by place value to subtract two 2-digit numbers?

Sample answer: I would choose to decompose to make the subtraction easier. Then I can do some of the subtraction mentally.

Which subtraction strategy do you find most efficient?

Sample answer: I think decomposing to subtract is more efficient because I can complete most of the math in my head.

Unit 5

How Ready Am I?

Name _____

1. Which expression can be used to represent the array?



A. $4 + 4 + 4 + 4$

B. $4 + 3$

C. 4×3

D. $4 \times 4 \times 4$

2. Jenny is selling lip balm. She places 5 rows of lip balm on the counter. There are 3 lip balms in each row. How many lip balms does Jenny place on the counter?

A. 8

B. 9

C. 10

D. 15

3. Ben has 3 rows of tomato plants in his garden. There are 6 plants in each row. Which equation represents how many tomato plants Ben has in his garden?

A. $6 + 6 + 6 = 18$

B. $6 + 6 + 6 + 6 = 24$

C. $3 + 3 + 3 + 3 + 3 = 15$

D. $3 + 3 + 3 + 3 + 3 + 3 + 3 = 21$

4. In which equation will 6 make the equation true?

A. $3 \times \square = 24$

B. $4 \times \square = 28$

C. $5 \times \square = 30$

D. $8 \times \square = 40$

5. Martin will visit his cousins in 2 weeks. The number of days in 2 weeks is shown in the multiplication problem.
- $$2 \times 7 = \square$$
- How many days are there until Martin visits his cousins?
- A. 4 days
 B. 9 days
 C. 11 days
 D. 14 days

6. Mabel grows carrots in her garden as shown. Which multiplication fact shows how many carrots grow in Mabel's garden?



- A. $6 \times 6 = 36$
 B. $8 \times 6 = 48$
 C. $6 \times 9 = 54$
 D. $9 \times 9 = 81$

7. Kira and Brandon tie 2 balloons to each chair at a table. They use 8 balloons in all. Which equation can be used to find how many chairs are at the table?

- A. $8 = 2 \times \square$
 B. $8 \times 2 = \square$
 C. $\square = 2 \times 8$
 D. $8 \times \square = 2$

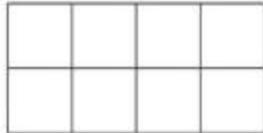
8. Rosie plants 5 rows of flowers. She plants 7 flowers in each row. Which of the following equations represents the number of flowers Rosie plants?

- A. $5 + 5 = 10$ B. $5 + 7 = 12$
 C. $5 \times 7 = 35$ D. $7 \times 7 = 49$

9. Which multiplication equation is true?

- A. $2 \times 5 = 15$ B. $2 \times 6 = 12$
 C. $2 \times 8 = 10$ D. $2 \times 9 = 16$

10. Which multiplication equation does the array represent?



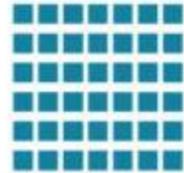
- A. $2 \times 4 = 8$ B. $4 = 8 \times 2$
 C. $2 \times 8 = 4$ D. $4 \times 8 = 2$

Learn

Rocco places game cards into 6 rows of 7.

How can you find the total number of cards?

You can decompose 6 or 7 to help you multiply.



Decompose 6 into 5 and 1.

$$6 \times 7 = 1 \times 7 + 5 \times 7$$

$$6 \times 7 = 7 + 35$$

$$6 \times 7 = 42$$

Decompose 7 into 5 and 2.

$$6 \times 7 = 6 \times 5 + 6 \times 2$$

$$6 \times 7 = 30 + 12$$

$$6 \times 7 = 42$$

You can decompose a factor in a multiplication fact to help you find the product. A property of multiplication explains why this strategy can be used.

Math is... Generalizations

How can you decide how to decompose a factor?

Work Together

How can you decompose 3×8 to find the total number of crayons in the box? **Sample answer:**

You can decompose 3 into 2 and 1. So $3 \times 8 = 2 \times 8 + 1 \times 8$. That is $16 + 8 = 24$, so $3 \times 8 = 24$.



On My Own



Name _____

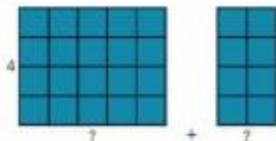
Solve. **Sample answers shown.**

1. How can you use the representation to decompose 7?

$$4 \times 7 = 4 \times \underline{5} + 4 \times \underline{2}$$

$$4 \times 7 = \underline{20} + \underline{8}$$

$$4 \times 7 = \underline{28}$$



2. How can you decompose 9×6 ?

$$9 \times 6 = \underline{5} \times \underline{6} + \underline{4} \times \underline{6}$$

$$9 \times 6 = \underline{30} + \underline{24}$$

$$9 \times 6 = \underline{54}$$

What number makes the equation true?

3. $? \times 7 = 3 \times 7 + 3 \times 7$

$$? = \underline{6}$$

4. $7 \times ? = 5 \times 8 + 2 \times 8$

$$? = \underline{8}$$

5. $1 \times 9 + 5 \times 9 = 9 \times ?$

$$\underline{6} = ?$$

6. $6 \times 2 + 6 \times 2 = 6 \times ?$

$$\underline{4} = ?$$

How can you decompose one of the factors to find the product?

Sample answers shown.

7. $8 \times 6 = \underline{4} \times \underline{6} + \underline{4} \times \underline{6}$

$$8 \times 6 = \underline{24} + \underline{24}$$

$$8 \times 6 = \underline{48}$$

8. $9 \times 7 = \underline{5} \times \underline{7} + \underline{4} \times \underline{7}$

$$9 \times 7 = \underline{35} + \underline{28}$$

$$9 \times 7 = \underline{63}$$

9. $9 \times 8 = \underline{9} \times \underline{4} + \underline{9} \times \underline{4}$

$$9 \times 8 = \underline{36} + \underline{36}$$

$$9 \times 8 = \underline{72}$$

10. $8 \times 4 = \underline{8} \times \underline{2} + \underline{8} \times \underline{2}$

$$8 \times 4 = \underline{16} + \underline{16}$$

$$8 \times 4 = \underline{32}$$

11. **STEM Connection** Some nurses work 8 hours each day for 7 days. How many hours do some nurses work in 7 days? Explain your strategy.

56 hours; Sample answer:

I decomposed 8 into two 4s. Then I doubled the product of 4×7 to get 56.



12. **Extend Your Thinking** If you decompose a factor in a multiplication equation in different ways to multiply, will the product always be the same? Explain.

Yes. Sample answer: I know this is true because if you represent the equation with an array, the total number in the array does not change no matter how you decompose it.

Reflect

How can decomposing a factor help solve a multiplication equation?

Answers may vary.

Math is... Mindset

How did your strengths in other areas help you in math?

Learn

Yazmin set up 3 rows of 9 chairs for the talent show.



How can you find the total number of chairs?

You can represent the problem with an array and a multiplication equation.

Decompose 3 into 2 and 1.

$$3 \times 9 = ?$$



$1 \times 9 = ?$

Math is... Structure

How can decomposing a 3s fact help you find the product of 3×9 ?

Find the product of the 2s fact and 1s fact. Then add the products together.

$$3 \times 9 = ?$$



You can decompose 3s facts into a 2s fact and a 1s fact. Then, find the sum of the products.

Work Together

James places 7 cans each on the 3 shelves in the kitchen pantry. How can you decompose 3 to find the total number of cans?

Sample answer: I can decompose 3 into 2 and 1. $2 \times 7 + 1 \times 7 = 21$. 21 cans

On My Own

Name _____

What number completes the equation?

- $3 \times 4 = \underline{12}$
- $3 \times \underline{6} = 6 \times 3$
- $24 = 3 \times \underline{8}$
- $3 \times \underline{2} = 6$
- $3 \times 10 = 10 \times \underline{3}$
- $0 \times 3 = \underline{0}$
- $3 \times \underline{1} = 3$
- $\underline{27} = 3 \times 9$

How can you decompose a factor to solve the problem? Show your thinking.

- Wyatt saves \$5 each week. How much money will he have after 3 weeks?
**Sample answer: $2 \times 5 + 1 \times 5 = 15$
\$15**
- Otto has 7 packs of 3 erasers. How many erasers does Otto have in all?
**Sample answer: $2 \times 7 + 1 \times 7 = 21$
21 erasers**
- Caitlyn walks dogs 3 times a day. She walks dogs 6 days in a row. How many walks does she take during those 6 days?
**Sample answer: $2 \times 6 + 1 \times 6 = 18$
18 walks**

Choose the correct answer.

12. Which is equal to 3×9 ?

- A. $2 \times 9 + 7 \times 9$
- B. $2 \times 1 + 7 \times 9$
- C. $3 \times 9 + 1 \times 9$
- D. $2 \times 9 + 1 \times 9$**

13. Which is equal to 3×6 ?

- A. $2 \times 6 + 1 \times 6$**
- B. $2 \times 1 + 3 \times 3$
- C. $3 \times 6 + 1 \times 6$
- D. $3 \times 3 + 1 \times 2$

14. Doris played in 3 basketball games. The number of baskets she made is shown. If all her baskets were 2-pointers, how many points did she score per game? What if they were all 3-pointers? Complete the table.

Number of Baskets	2-Pointers	3-Pointers
4	$2 \times 4 = 8$	$3 \times 4 = 12$ or $4 \times 3 = 12$
3	$2 \times 3 = 6$ or $3 \times 2 = 6$	$3 \times 3 = 9$
5	$2 \times 5 = 10$ or $5 \times 2 = 10$	$3 \times 5 = 15$ or $5 \times 3 = 15$

15. **Extend Your Thinking** Moustafa decomposes 3 to find the product of 3×8 is 24. Now Moustafa needs to find the product of 8×3 . He says he can decompose the fact into 8×2 and add 8. How can Moustafa use a different strategy to solve? **Sample answer: Moustafa can use a property of multiplication to solve. The order of the factors does not change the product. So the product of 3×8 is the same as the product of 8×3 , 24.**

Reflect

How can you use properties to recall facts that multiply with 3?

Answers may vary.

Math is... Mindset

What helped you to do your best work?

Learn

Jane is going on vacation in exactly 4 weeks.



$4 \times 7 = ?$

How can you find the number of days until her vacation?

You can represent the problem with an array and a multiplication equation.

Decompose 4 into two 2s and multiply each by 7.



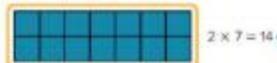
$2 \times 7 = ?$



$2 \times 7 = ?$

$4 \times 7 = ?$

Find the product of the 2s facts. Then add the products together.



$2 \times 7 = 14$



$2 \times 7 = 14$

28

$4 \times 7 = 28$

You can decompose 4s facts into two 2s facts to multiply.

Find the product of one 2s fact, and then double the product to find the product of a 4s fact.

Math is... Generalizations

How are the 2s facts related to the 4s facts?

Work Together

What strategy could you use to find 4×8 ? Show your thinking.

Sample answer: You can decompose the 4 into two 2s. Find the product of 2×8 and then double the product. $2 \times 8 = 16$; $16 + 16 = 32$; $4 \times 8 = 32$

On My Own

Name _____

How can you use the 2s fact to find the unknown?

- $8 \times 2 = 16$ $4 \times 8 = \underline{32}$
- $2 \times 3 = 6$ $4 \times \underline{3} = 12$
- $2 \times 9 = 18$ $9 \times 4 = \underline{36}$
- $5 \times 2 = 10$ $5 \times \underline{4} = 20$
- $6 \times 2 = 12$ $6 \times 4 = \underline{24}$

How can you decompose to solve the problem?

Show your thinking.

- Mrs. Turner uses 9 eggs every week to make breakfast for her family. How many eggs does she use in 4 weeks?
Sample answer: $2 \times 9 + 2 \times 9 = 36$
36 eggs
- Tyler made 4 friendship bracelets for each of his friends. How many bracelets did he make if he has 8 friends?
Sample answer: $2 \times 8 = 16$; $16 + 16 = 32$
32 bracelets
- Luis babysits for 4 hours. He makes \$6 per hour. How much does he make in all?
Sample answer: $6 \times 2 + 6 \times 2 = 24$
\$24



9. **Error Analysis** Zara found the product of 4×7 .

She followed these steps.

- First, she found the product of 2×7 , which is 14.
- Then, she added $14 + 14 = 28$.

Zara says that $4 \times 7 = 28$. Do you agree or disagree? Explain.

Agree; Sample answer: I agree because when you double a 2s fact, you get the product of a 4s fact.

10. What completes the equation?

$$\begin{array}{ll} 3 \times 4 = \underline{12} & 28 = \underline{7} \times 4 \\ 4 \times \underline{10} = 10 \times 4 & 5 \times \underline{4} = 20 \\ 4 = 4 \times \underline{1} & 6 \times 4 = \underline{4} \times 6 \\ 16 = 4 \times \underline{4} & \underline{36} = 4 \times 9 \end{array}$$

11. Which is equal to 9×4 ?

- A. $9 \times 2 + 9 \times 2$ B. $9 \times 4 + 9 \times 1$
C. $5 \times 2 + 4 \times 2$ D. $2 \times 4 + 2 \times 4$

12. **Extend Your Thinking** How can you use properties to find the products of 4×2 , 4×6 , and 4×0 ? Explain.

Sample answer: I know that $2 \times 4 = 8$ so 4×2 also equals 8. I can decompose 4×6 into two 2s facts and double the product to find 24. I know any number multiplied by 0 equals 0 so $4 \times 0 = 0$.

Reflect

How can you use a 2s fact to find a 4s fact? Explain your reasoning.

Answers may vary.

Math is... Mindset

How have different ideas and viewpoints helped you learn better?

Learn

Oscar rides a roller coaster with 6 rows of 4 seats.

How many people can fit on the roller coaster each ride?

Math is... Structure
What are the different ways you can decompose 6 to multiply by 6?

<p>You can decompose the factor 6 into 5 and 1.</p> <p>$6 \times 4 = ?$</p> <p>$5 \times 4 = 20$</p> <p>$1 \times 4 = 4$</p> <p>$6 \times 4 = 24$</p>	<p>You can decompose the factor 6 into 3 and 3.</p> <p>$6 \times 4 = ?$</p> <p>$3 \times 4 = 12$</p> <p>$3 \times 4 = 12$</p> <p>$6 \times 4 = 24$</p>
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You can decompose a 6s fact in different ways.

Find the product of a 5s fact and add one more group to find the product.

Double the product of a 3s fact to find the product.

Work Together

Oscar rides another roller coaster that has 6 rows of 8 seats. How can you decompose 6 to find the number of people that can ride the roller coaster?

Sample answer: Decompose 6 into 3 and 3;
 $3 \times 8 + 3 \times 8 = 48.$

On My Own

Name _____

How can you use the 3s facts to find the unknown?

- $3 \times 9 = 27$ $6 \times 9 = \underline{54}$
- $15 = 3 \times 5$ $\underline{30} = 5 \times 6$
- $24 = 8 \times 3$ $8 \times 6 = \underline{48}$
- $6 \times 3 = 18$ $6 \times \underline{6} = 36$

How can you decompose to solve the problem?

Show your thinking.

- Paul packs 8 boxes of snack bags for a school picnic. There are 6 snack bags in each box. How many snack bags does Paul pack in all?
Sample answer: $3 \times 8 + 3 \times 8 = 48$ 48 snack bags
- Roger places 5 basketballs in each crate. There are 6 crates. How many basketballs does Roger place in crates?
Sample answer: $5 \times 1 + 5 \times 5 = 30$ 30 basketballs
- Error Analysis** Brittany places action figures on 7 shelves with 6 on each shelf. She decomposes to find the total number of action figures. Do you agree with her work shown below? Explain.
 $7 \times 6 = 4 \times 3 + 3 \times 3$ **No. Sample answer: She decomposed 7 and 6, but she should have only decomposed 6.**
 $7 \times 6 = 12 + 9$
 $7 \times 6 = 21$

What completes the equation?

8. $6 \times 7 = \underline{42}$

9. $30 = \underline{5} \times 6$

10. $12 = \underline{6} \times 2$

11. $4 \times 6 = \underline{6} \times 4$

12. $9 \times 6 = \underline{54}$

13. $\underline{60} = 6 \times 10$

14. $1 \times 6 = 6 \times \underline{1}$

15. $6 \times 8 = \underline{48}$

16. Which are equal to 6×5 ?

Choose all that apply.

- A. 5×6
- B. $3 \times 5 + 3 \times 5$
- C. $5 \times 4 + 1 \times 1$
- D. 6×3
- E. $5 \times 5 + 1 \times 5$
- F. $3 \times 3 + 4 \times 1$



17. **Extend Your Thinking** How can you explain why a number that is a product of 6 is also a product of 3?

Sample answer: You can double the product of a 3s fact to get the product of a 6s fact. The product of 6×2 is 12. This is double the product of 3×2 or is the same as 3×4 .

Reflect

How can you use a property of multiplication to find the product of 6×7 in two different ways? Show your thinking.

Answers may vary.

Math is... Mindset

How did you make sure you shared your thinking clearly?

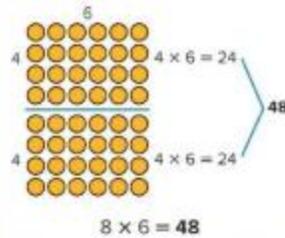
Learn

A gardener plants 8 rows of 6 sunflowers.

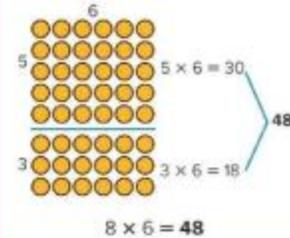
How can you find the total number of sunflowers he planted?



You can double the product of 4×6 to determine the product of 8×6 .



You can use a 5s fact and a 3s fact to determine the product of 8×6 .



You can decompose 8s facts in different ways.

Double the product of a 4s fact to find a product of 8.

You can use a 5s fact to recall an 8s fact.

Math is... Structure

How can you explain why the product of an 8s fact is always double the product of a 4s fact?

Work Together

What multiplication facts can help you find the product of 7×8 , and how can you use them?

Sample answer: A 4s fact or a 5s fact can help you find the product. You can double the product of 7×4 . You can add the products of 7×5 and 7×3 .

On My Own



Name _____

1. The array represents 3×4 . How can you use it to find the product of 3×8 ? Draw to show your work.



See students' drawings.

$$3 \times 8 = \underline{24}$$

2. Jonathan placed cubes in 8 rows, with 6 cubes in each row. How can you decompose a factor to find the number of cubes he placed?

Sample answer: $4 \times 6 = 24$; $24 + 24 = 48$

48 cubes

3. How can you find the products of 1×8 and 8×1 without decomposing?

Sample answer: I can use properties of multiplication. Any number multiplied by 1 is itself and the order of the factors does not change the product so both products equal 8.

How can you use 2s and 4s facts to complete 8s facts?

4. $2 \times 3 = \underline{6}$ $4 \times 3 = \underline{12}$ $8 \times 3 = \underline{24}$
 5. $2 \times 4 = \underline{8}$ $4 \times 4 = \underline{16}$ $8 \times 4 = \underline{32}$
 6. $2 \times 5 = \underline{10}$ $4 \times 5 = \underline{20}$ $8 \times 5 = \underline{40}$

7. Complete each step to find the product of 8×9 using a 5s fact and a 3s fact.

$$5 \times 9 = \underline{45}$$

$$\underline{3} \times 9 = 27$$

$$27 + \underline{45} = \underline{72}$$

$$8 \times 9 = \underline{72}$$

8. **Error Analysis** Tobias says that he can find the product of 4×8 by decomposing either of the factors into equal parts. Do you agree or disagree? Explain.

Agree. Sample answer: He can decompose 4 into 2 and 2 or 8 into 4 and 4.

How can you complete the equation?

9. $\underline{24} = 3 \times 8$

10. $7 \times 8 = \underline{56}$

11. $6 \times 8 = \underline{48}$

12. $\underline{80} = 10 \times 8$

13. $8 \times 4 = \underline{32}$

14. $8 \times 8 = \underline{64}$

15. **Extend Your Thinking** Each player in a game has 8 tokens. There are 7 players in the game. How can you decompose in two different ways to find the total number of tokens?

Sample answer: $3 \times 7 + 5 \times 7 = 21 + 35 = 56$ or double 4×7

Reflect

How can you use different properties of multiplication to recall 8s facts?

Answers may vary.

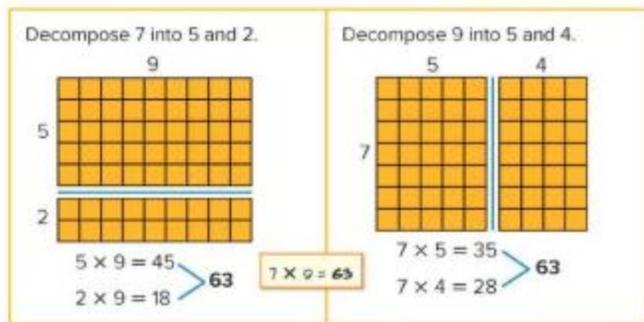
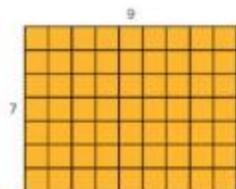
Math is... Mindset

How confident are you that you were successful today?

Learn

Dustin places 9 books on each of 7 shelves.

How can you find the total number of books he places on the shelves?



You can decompose to find products of 7s and 9s facts.

Use a 5s fact to help recall a 7s fact or 9s fact.

Math is... Structure

How can you explain why an array that represents 7×9 also shows 9×7 ?

Work Together

Carley hangs 9 photos in each of 6 rows on the wall. How can you decompose 9 to find the number of photos she hangs?

Sample answer: You can decompose 9 into 5 and 4, then add the products of 6×5 and 6×4 ; 54 photos.

On My Own

Name _____

What number completes the equation?

- $7 \times 9 = \underline{63}$
- $9 \times 6 = \underline{54}$
- $\underline{2} \times 9 = 18$
- $5 \times 7 = 7 \times \underline{5}$
- $\underline{3} \times 7 = 21$
- $\underline{49} = 7 \times 7$
- $9 \times 9 = \underline{81}$
- $\underline{9} \times 10 = 10 \times 9$
- $8 \times 7 = \underline{56}$

How can you decompose to solve?

10. Alex arranges his rock collection in 9 rows with 4 rocks in each row. How can you use a 5s fact to find how many rocks Alex has in all?

Sample answer: Students may draw a 9 by 4 array, show decomposing 9 into 4 and 5, then show $4 \times 4 = 16$, $5 \times 4 = 20$, and $16 + 20 = 36$.

36 rocks

11. Lula's mother buys 7 packs of smoothies. Each pack has 6 smoothie bottles. How can you use a 5s fact to find how many smoothies she buys in all?

Sample answer: Students may draw a 7 by 6 array, show decomposing 7 into 5 and 2, then show $5 \times 6 = 30$, $2 \times 6 = 12$, and $30 + 12 = 42$.

42 smoothies

12. Tony knows his 4s and 5s facts well. How can he use properties of multiplication to find the products of 7×4 and 9×5 ? Explain your thinking.

Sample answer: The order of the factors does not change the product. So, if Tony knows $4 \times 7 = 28$ and $5 \times 9 = 45$ he knows $7 \times 4 = 28$ and $9 \times 5 = 45$.

13. **STEM Connection** There are 7 rows of desks in Grace's computer lab. Each row has 5 desks. Draw an array to represent her computer lab, and then decompose one of the factors to find the total number of desks in the lab.

35 desks; Sample answer:
 $5 \times 5 + 2 \times 5 = 25 + 10 = 35$;
Check students' drawings.



14. **Extend Your Thinking** Ava has 10 packages of erasers. Each pack has 6 erasers. She gives 1 pack of the erasers to a friend. How many erasers does Ava have left? Show each step.

54 erasers; Sample answer: $10 - 1 = 9$;
 $9 \times 6 = 9 \times 3 + 9 \times 3 = 54$.

Reflect

What is a strategy you can use to recall a 7s fact and a 9s fact?

Answers may vary.

Math is... Mindset

What did you do to stay focused on your work?

Unit 5

Multiply by 7 and 9



Name _____

Decide which strategies can be used to find the product of the two factors.

1. Which of these show a strategy for multiplying 7×6 ?

Circle *all* correct strategies.

- a. $7 \times 5 + 7 \times 1$
 b. $7 \times 5 + 1$
 c. $7 \times 3 + 7 \times 3$
 d. $7 \times 7 + 6$

Explain or show your thinking.

Explanations may vary.

2. Which of these show a strategy for multiplying 7×7 ?

Circle *all* correct strategies.

- a. $7 \times 5 + 7 \times 2$
 b. $7 \times 5 + 2$
 c. $7 \times 3 + 7 \times 4$
 d. $7 \times 7 + 8$

Explain or show your thinking.

Explanations may vary.

Decide which strategies can be used to find the product of the two factors.

3. Which of these show a strategy for multiplying 9×7 ? Circle *all* correct strategies.

- a. $9 \times 5 + 9 \times 2$
- b. $9 \times 5 + 2$
- c. $9 \times 4 + 9 \times 3$
- d. $9 \times 10 + 3$

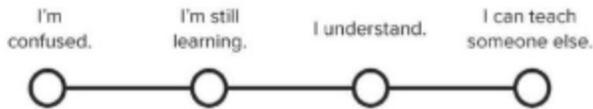
Explain or show your thinking.
Explanations may vary.

4. Which of these show a strategy for multiplying 9×9 ? Circle *all* correct strategies.

- a. $9 \times 5 + 9 \times 4$
- b. $9 \times 5 + 4$
- c. $9 \times 7 + 9 \times 2$
- d. $9 \times 10 + 1$

Explain or show your thinking.
Explanations may vary.

Reflect On Your Learning

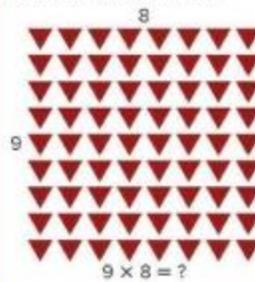


Learn

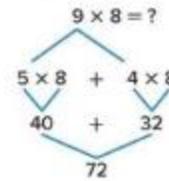
Kyla needs to add 8 flags to each of 9 swimming pool lanes for an upcoming meet.

How many flags does she need in total?

Draw an array and write an equation to represent the unknown in the problem.



Decompose a factor to help you find the product.



$9 \times 8 = 72$

Kyla needs 72 flags.

You can represent a multiplication problem with an array and equation.

You can decompose a factor to help you solve the problem.

Math is... Structure

How could you decompose 8, instead of 9, to solve the problem?

Work Together

An artist places 7 clay bowls on each of 6 shelves in a display case. How can you decompose a factor to find the number of bowls the artist displays?

Sample answer: You can decompose 6 into $3 + 3$. You can double the product of $7 \times 3 = 21$ to find the artist displays 42 bowls.

On My Own



Name _____

How can you draw an array and decompose a factor to show your work?

1. A box of soup cans is arranged in 8 rows with 6 cans in each row. How many cans of soup are in the box?
Sample answer: Students may draw an 8 by 6 array, decompose 8 into $4 + 4$, then double the product of $4 \times 6 = 24$ to find 48.
48 cans of soup
2. The cafeteria has 6 tables and 4 seats at each table. How many seats are in the cafeteria?
Sample answer: Students may draw a 6 by 4 array, decompose 6 into $3 + 3$, then double the product of $3 \times 4 = 12$ to find 24.
24 seats

What completes the equation?

- | | |
|-------------------------------|--------------------------------|
| 3. $8 \times 5 =$ <u>40</u> | 4. <u>42</u> $= 7 \times 6$ |
| 5. $6 \times$ <u>9</u> $= 54$ | 6. $3 \times 7 =$ <u>21</u> |
| 7. $9 \times 3 =$ <u>27</u> | 8. $4 \times$ <u>9</u> $= 36$ |
| 9. <u>7</u> $\times 8 = 56$ | 10. $72 =$ <u>9</u> $\times 8$ |
| 11. <u>32</u> $= 4 \times 8$ | 12. $4 \times 7 =$ <u>28</u> |

13. **STEM Connection** Finn is drawing a picture of a hotel. The first floor has 9 hallways with 9 doors in each hallway. The second floor has 9 hallways with some doors in each hall.



- a. How many doors are on the first floor?
81
 - b. How many doors are on the second floor if there are 6 doors in each hallway?
54
14. Sawyer wants to find 7×9 . She starts by drawing an array. Number her next steps in the correct order to find the product.
- 2** She finds the products 7×4 and 7×5 .
 - 4** She finds the product of $7 \times 9 = 63$.
 - 1** She decomposes the factor 9 into 4 and 5.
 - 3** She adds 28 and 35.
15. **Extend Your Thinking** Braxton lost his homework assignment, but he still has his answer sheet. For one of the problems, he drew an array with one factor decomposed into 5 and 2. What might have been the problem? Explain.
Sample answer: 7×8 ; his problem could have been any multiplication equation with the factor 7.

Reflect

What is a strategy you can use to solve a multiplication problem with an array?

Answers may vary.

Math is... Mindset

How did you know when there was a problem?

Unit Review

Name _____

Vocabulary Review

Choose the correct word to complete each sentence.

array	product
decompose	unknown
multiplication	

- When you **decompose**, you break a number into different parts. (Lesson 5-3)
- You can decompose a factor in a **multiplication** fact to help find the product. (Lesson 5-3)
- The **product** is the answer to a multiplication equation. (Lesson 5-3)
- Arrays can be used to find the **unknown** in a word problem. (Lesson 5-7)
- A(n) **array** is an arrangement of objects in rows and columns. (Lesson 5-3)

Review

- There are 3 bags of marbles. Each bag holds 4 marbles. Which equation could be used to determine the total number of marbles? (Lesson 5-3)
A. $3 \times 2 + 3 \times 1 = ?$
B. $3 \times 2 + 3 \times 2 = ?$
C. $4 \times 2 + 4 \times 2 = ?$
D. $4 \times 4 + 4 \times 1 = ?$
- There are 7 cars in the parking lot, and each car has 4 tires. Which equation could be used to show how many tires there are in total in the parking lot? (Lesson 5-6)
A. $7 \times 4 + 7 \times 1 = ?$
B. $7 \times 2 + 7 \times 2 = ?$
C. $4 \times 2 + 3 \times 2 = ?$
D. $4 \times 4 + 3 \times 1 = ?$
- A bucket containing 8 markers is placed on each table. There are 7 tables in the classroom. How many markers are there in all? (Lesson 5-6)
There are **56** markers.
- Coach Kofi buys 8 packages of tennis balls. Each package has 6 tennis balls. Complete the equation to show how many balls he buys in all. (Lesson 5-5)
 $8 \times 6 = 6 \times \underline{4} + \underline{6} \times 4$
 $8 \times 6 = \underline{24} + \underline{24}$
 $8 \times 6 = \underline{48}$
- Kelly buys 3 bags of erasers. Each bag has 8 erasers. To find how many erasers she buys in all, she doubles 8 to get 16. What should she do next? (Lesson 5-2)
Sample answer: She should add one more 8 to 16, or find $16 + 8 = 24$.
- Explain how knowing $2 \times 9 = 18$ can help solve 4×9 . (Lesson 5-3)
Sample answer: You can double the product of 2×9 to get 4×9 . 18 doubled is 36, $4 \times 9 = 36$.

Performance Task

Part A: The nurse needs to deliver medication to 7 patients and it will take about 8 minutes for each patient. How many minutes will it take to deliver all the medication? Represent two different ways to decompose to solve the problem.

56 minutes; Sample answer: $8 \times 7 = 4 \times 7 + 4 \times 7$;
 $8 \times 7 = 8 \times 5 + 8 \times 2$; $8 \times 7 = 56$

Part B: The nurse provides medication to each of his 7 patients. Each patient receives 2 units of medication. They take this medication 2 times each day. How many units of medication does he need to provide medication to all his patients in one day? Show your work.

28 units; Sample answer: $7 \times 2 = 14$;
 $14 \times 2 = 10 \times 2 + 4 \times 2$

Part C: It takes the nurse 6 minutes to review and update a patient's chart. How long will it take him to review 2 patients' charts? 4 patients' charts? 8 patients' charts? Explain how you found your answers.

12 minutes; 24 minutes; 48 minutes; Sample answer: I know $2 \times 6 = 12$. I can double the product of 2 and 6 to find the product of 4 and 6, 24. Then I can double the product of 4 and 6 to find the product of 8 and 6, 48.

Reflect

What are some different strategies you can use to multiply?

Answers may vary.

Unit 5

Fluency Practice

Name _____

Fluency Strategy

You can use partial sums to find a sum.

Partial Sums	
	265
	$+ 513$
$200 + 500$	700
$60 + 10$	70
$5 + 3$	8
	778
$265 + 513 = 778$	

1. Use partial sums to add.

	536
	$+ 143$
$500 + 100$	600
$30 + 40$	70
$6 + 3$	9
	679

Fluency Flash

How can you write equations to add each place value and add the partial sums? Use the base-ten blocks to help.

2. 

$1 + 5 = 6$;
$20 + 50 = 70$;
$200 + 100 = 300$;
$6 + 70 + 300 = 376$

Fluency Check

How can you find the sum or difference?

- | | |
|-----------------------------|------------------------------|
| 3. $284 + 315 =$ <u>599</u> | 10. $84 + 12 =$ <u>96</u> |
| 4. $74 - 13 =$ <u>61</u> | 11. $106 + 292 =$ <u>398</u> |
| 5. $354 + 214 =$ <u>568</u> | 12. $65 - 24 =$ <u>41</u> |
| 6. $36 + 48 =$ <u>84</u> | 13. $323 + 412 =$ <u>735</u> |
| 7. $182 + 604 =$ <u>786</u> | 14. $88 - 47 =$ <u>41</u> |
| 8. $96 - 32 =$ <u>64</u> | 15. $572 + 415 =$ <u>987</u> |
| 9. $346 + 520 =$ <u>866</u> | 16. $52 + 34 =$ <u>86</u> |

Fluency Talk

How would you explain to a friend how to use partial sums for adding two 3-digit numbers?

Sample answer: $214 + 572 = 786$. To find the sum of $214 + 572$, I added the hundreds $200 + 500$, the tens $10 + 70$, and the ones $4 + 2$. Finally, I added the partial sums, 700 , 80 and 6 , to find the sum, 786 .

Use an example to explain how you would subtract two 2-digit numbers using decomposing.

Sample answer: $65 - 42 = 23$; First you would subtract the tens. $65 - 40 = 25$. Then you would subtract the ones. $25 - 2 = 23$.

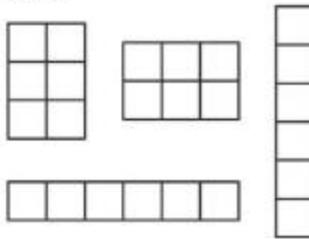


Name _____

How Many Rectangles?

Look at each rectangle. What do you notice?

Part A



Part B

How many square tiles between 10 and 15 will make the most rectangles? 12

Use square tiles to make all of the possible rectangles for each number. Use the table to record your results.

See students' work.

Number of Tiles	Number of Rectangles	Dimensions of Each Rectangle
10		
11		
12		
13		
14		
15		

Learn

Grayson will cover a bulletin board with square sheets of paper. He wants to use the fewest sheets, without any gaps or overlaps.

How can Grayson determine the number of sheets he will need?



You can place **unit squares** on a figure without gaps or overlaps. This is called tiling.

unit square 1 unit
1 unit



Count the unit squares that cover the figure.

unit square 1 unit
1 unit

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15

Grayson will need 15 sheets to cover the bulletin board.

Area is the amount of surface inside a figure. You can find the area of a figure by tiling it. The area of the bulletin board is 15 **square units**.

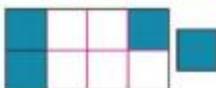
You can find the area of a figure by tiling, and then counting the unit squares that cover the figure.

Math is... Quantities
How might the area be different if there were gaps or overlaps?

Work Together

How can you find the area of this figure?

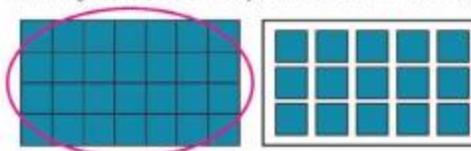
Sample answer: I can tile the figure with unit squares with no gaps or overlaps. 8 unit squares cover the figure.



On My Own

Name _____

1. Which figure is tiled correctly to find the area? Circle it.



What is the area of the figure? Draw to complete the tiling.

2.



area = **18** square units

3.



area = **16** square units

4.



area = **24** square units

5.

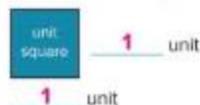


area = **18** square units

6. Why is it important that there are no gaps or overlaps when tiling a figure?

Sample answer: If there are gaps, you might count fewer tiles than you need. If there are overlaps, you might count more tiles than you need.

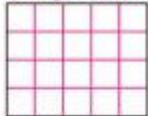
7. Label the length of each side of the unit square.



Draw to represent the area by tiling.

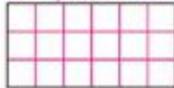
8. area = 20 square units

Sample answer:



9. area = 18 square units

Sample answer:



10. **STEM Connection** Sam designs a doghouse.

He plans to cover the floor with a mat and will need to know the area. How can you tile the figure below to find the area of the doghouse floor?

6 square units



11. Why is using unit squares rather than circles better to determine the area of a figure?

Sample answer: Unit squares can be placed together without gaps or overlaps.

12. **Extend Your Thinking** How does the number of unit squares along the side of a figure relate to the length of the figure? Explain. Sample answer: The length of a side of a figure is equal to the sum of the lengths of unit squares that cover that side of the figure.

Reflect

How does tiling a figure help you find the area of the figure? Explain.

Answers may vary.

Math is... Mindset

How have you built a positive relationship with classmates?

Learn

Misha is choosing a new rug for her room.

How can she decide which rug will cover the greater area?



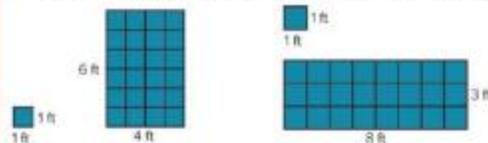
You can tile each figure with unit squares. You can use square feet to measure the area of each rug.



Math is... Precision

What information helps you decide which unit square to choose?

Count the number of square feet that cover each figure.



Both rugs have an area of 24 square feet.

Area can be found by tiling a figure and counting the unit squares. Unit squares can have specific side length measurements.

Work Together

A red carpet is 4 meters long and 3 meters wide. A green carpet is 4 meters long and 5 meters wide. Which carpet covers a greater area? Explain how you know.

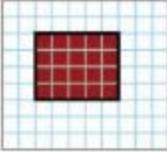
Green carpet; Sample answer: I can draw to represent tiling each carpet. The area of the red carpet is 12 square meters. The area of the green carpet is 20 square meters.

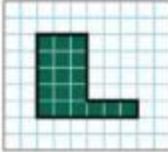
On My Own

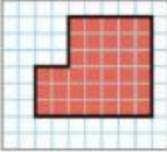


Name _____

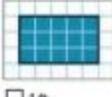
How can you find the area of the figure? Label the area with the unit.

1.  area = 20 square units

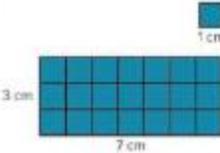
2.  area = 18 square units

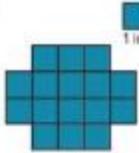
3.  area = 36 square units

4. 
 \square 1 m
 1 m area = 13 square meters

5. 
 \square 1 ft
 1 ft area = 15 square feet

6. 
 \square 1 yd
 1 yd area = 25 square yards

7. 
 3 cm
 7 cm area = 21 square centimeters

8. 
 1 in.
 1 in. area = 16 square inches

9. How do you decide the unit to label the area of a figure?

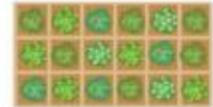
Sample answer: Use the same unit that is given for the side lengths of the figure being tiled. For example, if the side lengths are measured in inches, the area is measured in square inches.

10. Jaime's workshop table is 20 square feet. Which of these could be the side lengths of the table? Explain.

2 feet and 10 feet 4 feet and 5 feet 2 feet and 5 feet

2 feet and 10 feet; 4 feet and 5 feet; Sample answer: I drew grids of squares and counted the squares. 2 rows of 10 is 20; 4 rows of 5 is 20; 2 rows of 5 is 10

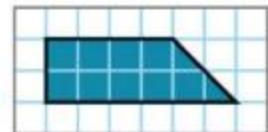
11. **STEM Connection** Sam designs a school garden. Each planter box will be 1 foot by 1 foot. What is the area of the garden?



18 square feet

12. **Extend Your Thinking** How can you find the area of the figure? Explain.

The area is 10 square units. Sample answer: Count the unit squares. The 2 half squares make 1 whole square.



Reflect

How can you use unit squares to determine the area of a rectangle?

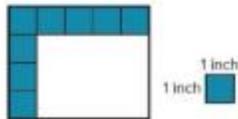
Answers may vary.

Math Is... Mindset

What helped you feel calm when you felt angry?

Learn

Marcus is trying to find the area of the rectangle with square inch tiles, but he runs out of tiles.

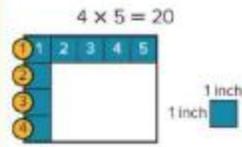


What strategy might he use to determine the area of the rectangle?

One Way Count the number of tiles in one row. Then draw to complete the tiling and count the number of tiles.



Another Way Count the number of rows and the number of tiles in one row. Then write a multiplication equation to represent the total number of tiles.



The area of the rectangle is 20 square inches.

Multiplication can be an efficient way to determine the area of a square or rectangle.

Math is... Explaining
Why might you use multiplication instead of tiling to find the area?

Work Together

How can you find the area of the square using the side length?

Sample answer: A square has 4 equal side lengths. I can use 5×5 to find the area. The area is 25 square centimeters.

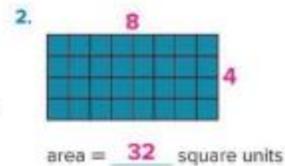
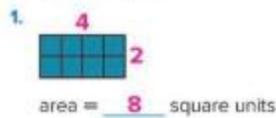
5 cm



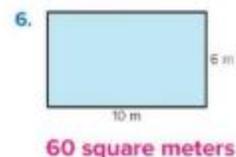
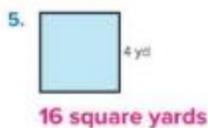
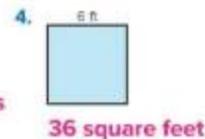
On My Own

Name _____

How can you label the side lengths and find the area of the rectangle?



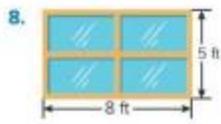
How can you determine the area of the figure? Label the area with the units.



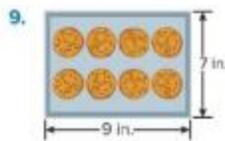
7. Why does tiling to find the area of a rectangle result in the same answer as multiplying to find the area? Explain.

Sample answer: Tiling a rectangle creates rows with the same number of tiles in each row, like an array. You can write a multiplication equation to show the number of rows multiplied by the tiles in each row, which is the same result as the number of tiles used to cover the figure.

How can you find the area of the object?



The area of the window is **40** square **feet**.



The area of the baking sheet is **63** square **inches**.

10. Enrique painted a mural on his sister's wall. The side lengths of the wall are shown. What is the area of the wall that Enrique painted?

72 square feet



11. Tonya is wrapping the front cover of her notebook. The cover is 10 inches long and 8 inches wide. What is the area of the cover?

80 square inches

12. **Extend Your Thinking** A closet floor is the shape of a rectangle. The area of the floor is 18 square feet. What could be the length and width of the floor?

Sample answer: 3 feet and 6 feet; I know 3 multiplied by 6 equals 18.

Reflect

How can you use multiplication to find the area of a rectangle?

Answers may vary.

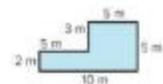
Math is... Mindset

What consequences were there for your decisions?

Learn

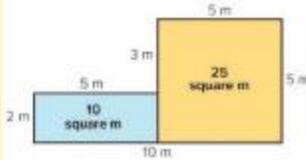
Deka's school is planning to put in a new playground.

How can you determine the area needed for the new playground?



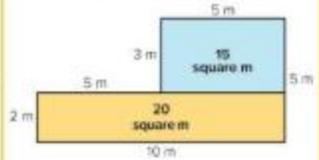
The playground is a **composite figure**. It is made of two or more figures.

One Way Decompose the figure into a square and rectangle.



$$\begin{aligned} 5 \times 5 &= 25 \\ 2 \times 5 &= 10 \\ 25 + 10 &= 35 \end{aligned}$$

Another Way Decompose the figure into two rectangles.



$$\begin{aligned} 5 \times 3 &= 15 \\ 2 \times 10 &= 20 \\ 15 + 20 &= 35 \end{aligned}$$

You can determine the area of a composite figure by decomposing it into rectangles or squares. Then you find the area of each figure and add the areas.

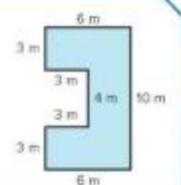
Math is... Quantities

What changes when you decompose a composite figure in a different way?

Work Together

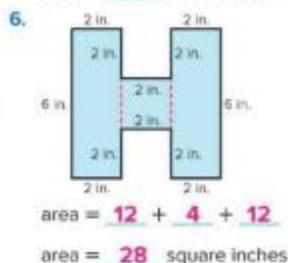
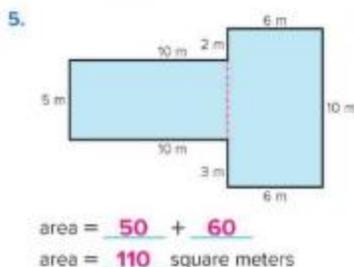
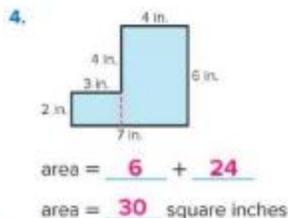
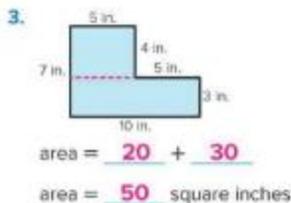
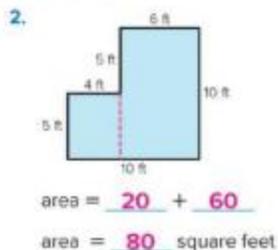
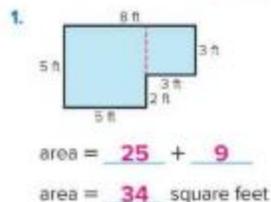
How can you decompose the figure to find the area of the playground?

Sample answer: Decompose the figure into 3 rectangles, find the area of each, and add them; $9 + 9 + 30 = 48$; 48 square meters.



Name _____

Draw one or more lines to partition each figure. Then find the area of the composite figure. **Sample answers shown.**

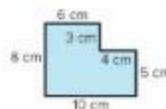


7. A composite figure is made of a rectangle and a square. The area of the composite figure is 44 square inches. The area of the square is 12 square inches. How can you determine the area of the rectangle?

Sample answer: You can subtract $44 - 12 = 32$. The area of the rectangle is 32 square inches.

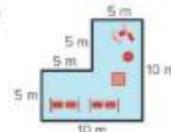
8. Paul says that the area of the figure is 68 square centimeters. How might he have determined the area?

Sample answer: Decompose the figure into 2 rectangles. $18 + 50 = 68$; 68 square centimeters.



9. **STEM Connection** Sam designs a playground for the city park. What is the area of the playground?

75 square meters

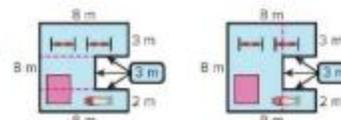


10. **Extend Your Thinking**

The same park is shown twice. How can you find the area of the park two different ways?

55 square meters;

Sample answer: $24 + 15 + 16 = 55$; $40 + 9 + 6 = 55$.



Reflect

How do you determine how to decompose a composite figure to find its area?

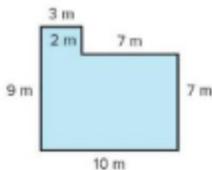
Answers may vary.

Math is... Mindset

What happened when you showed others you respect their ideas?

Name _____

Four students show expressions to find the area of the following figure.



Decide if each student's process will provide a correct way to determine the area.

1. Student A
 $9 \times 10 + 7 \times 7$

Circle Yes or No.

Yes No

Explain why you chose yes or no.

Explanations may vary.

2. Student B
 $7 \times 7 + 9 \times 3$

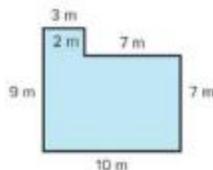
Circle Yes or No.

Yes No

Explain why you chose yes or no.

Explanations may vary.

Four students show expressions to find the area of the following figure.



Decide if each student's process will provide a correct way to determine the area.

3. Student C
 $3 \times 2 + 10 \times 7$

Circle Yes or No.

Yes No

Explain why you chose yes or no.

Explanations may vary.

4. Student D
 $9 \times 2 + 3 \times 7$

Circle Yes or No.

Yes No

Explain why you chose yes or no.

Explanations may vary.

Reflect On Your Learning

I am confused.

I'm still learning.

I understand.

I can teach someone else.



Learn

In the cafeteria, a table is 18 feet long and 4 feet wide.



How can you determine the area of the table?

Step 1 Decompose a side length. Find the area of each part.

Step 2 Add the areas of each part to find the total area.

$$18 \times 4 = 10 \times 4 + 8 \times 4$$

$$40 + 32$$

$$72$$

$18 \times 4 = 72$
The area of the table is 72 square feet.

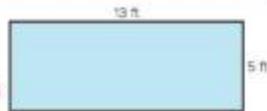
You can find the area of a rectangle by decomposing a side length and adding the areas of the smaller parts.

Math is... Thinking

Why would you decompose the side length into 10 and 8?

Work Together

How can you decompose the rectangle to find the area?



Sample answer: Decompose 13 into 10 and 3. Multiply 10×5 and 3×5 and then add the products, $50 + 15 = 65$. The area is 65 square feet.

On My Own

Name _____

How can you decompose to find the area of each rectangle?

- $$4 \times 8 = 4 \times 5 + 4 \times 3$$

$$4 \times 8 = 20 + 12$$

$$4 \times 8 = 32 \text{ square cm}$$
- $$6 \times 15 = 6 \times 5 + 6 \times 10$$

$$6 \times 15 = 30 + 60$$

$$6 \times 15 = 90 \text{ square m}$$
- $$8 \times 13 = 8 \times 10 + 8 \times 3$$

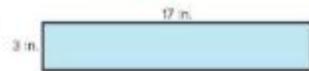
$$8 \times 13 = 80 + 24$$

$$8 \times 13 = 104 \text{ square in.}$$
- $$8 \times 14 = 8 \times 9 + 8 \times 5$$

$$8 \times 14 = 72 + 40$$

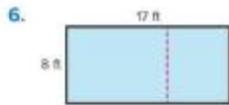
$$8 \times 14 = 112 \text{ square ft}$$

5. **Error Analysis** Joseph finds the area of the rectangle. His work is shown below.
- $$3 \times 17 = 2 \times 10 + 1 \times 7$$
- Will the area be correct? Explain.



No. Sample answer: The area will not be correct. Joseph should multiply 3×10 and 3×7 and add the products to find the area of the rectangle.

How can you decompose the rectangle into two smaller rectangles to find the area? **Sample answers shown.**



$$8 \times 17 = 8 \times 10 + 8 \times 7$$

$$8 \times 17 = 80 + 56$$

$$8 \times 17 = 136 \text{ square ft}$$

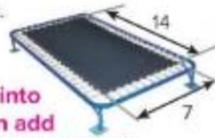


$$5 \times 16 = 5 \times 10 + 5 \times 6$$

$$5 \times 16 = 50 + 30$$

$$5 \times 16 = 80 \text{ square m}$$

8. The trampoline has a rectangular jumping mat. How can you decompose to find the area of the jumping mat?



Sample answer: I can decompose 14 into 10 and 4 and multiply each by 7. Then add the products, $70 + 28$. The area is 98 square feet.

9. **Extend Your Thinking** Jordan multiplies to find the area of a rectangle in square inches. His work is shown.

$$9 \times 3 + 9 \times 11 = 126$$

What are the width and length of the rectangle? Explain.

9 ft and 14 ft; Sample answer: Since 9 is used as a factor twice, it is the width. $3 + 11 = 14$, so the length is 14.

Reflect

How can you decompose to determine the area of a rectangle?

Answers may vary.

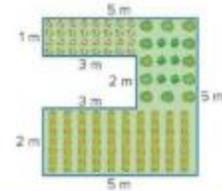
Math is... Mindset

How did it help to understand your feelings today?

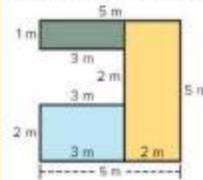
Learn

Guillaume helps plant a city garden in the park.

What is the area of the garden?

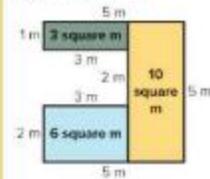


You can decompose the composite figure into 3 rectangles. Determine the area of each rectangle.



$$1 \times 3 = 3 \quad 2 \times 3 = 6 \quad 2 \times 5 = 10$$

Add the areas.



$$3 + 6 + 10 = 19$$

The area of the garden is 19 square meters.

You can use representations to help you make sense of area problems. One strategy to help you solve area problems is to decompose the figure.

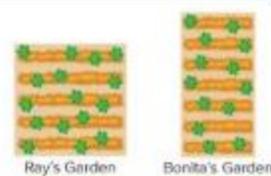
Math is... Explaining

How can you decompose the figure a different way?

Work Together

Ray's garden is 4 yards wide and 4 yards long. Bonita's garden is 3 yards wide and 5 yards long. Whose garden has a greater area? Show how you know.

Ray's; Sample answer:
 $4 \times 4 = 16$; $3 \times 5 = 15$



On My Own



Name _____

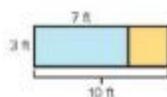
How can you solve the problem?

1. Merissa is making a banner that is 15 feet long and 4 feet wide. What is the area of the banner?



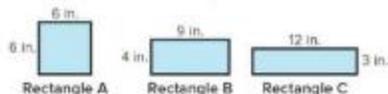
60 square feet

2. Some students are making a rectangular poster for school. Their poster is 7 feet long and 3 feet wide. The teacher wants them to increase the length of the poster to 10 feet. How will the new length change the size of the poster? Explain.



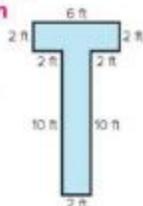
The area will increase by 9 square feet. Sample answer: The original area is 21 square feet. The new area is 30 square feet. $30 - 21 = 9$.

3. For a project, Huang cuts three rectangles from felt. How do their areas compare? Explain.



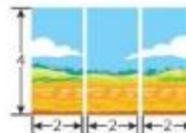
The areas are all equal. Sample answer: Multiply the length and width of each rectangle to get 36 square inches.

4. Talia paints a large T on the wall of her room. How much of the wall is covered by the T?



32 square feet

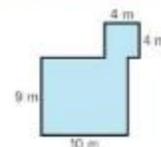
5. **Error Analysis** An artist produced a painting on three panels, which are to be set side-by-side. JoAnn and Joshua each find the same total area of the painting. Is their work correct? Explain.



JoAnn $4 \times 2 = 8$ $8 \times 3 = 24$ 24 square units	Joshua $2 + 2 + 2 = 6$ $6 \times 4 = 24$ 24 square units
---	---

They are both correct. Sample answer: JoAnn found the area of one panel and then multiplied by 3. Joshua added the widths of the decomposed rectangle to find the total width, and then multiplied by the length to find the area.

6. Alejandro designs a patio for his backyard. What is the area of the patio?



106 square meters

7. **Extend Your Thinking** A piece of fabric has an area of 24 square inches.

- What could be the length and width of the piece of fabric?
Sample answer: 4 inches, 6 inches
- How can you find all possible lengths and widths of the piece of fabric?
Sample answer: I can find all the basic facts with a product of 24.

Reflect

When might you decompose a side length to find the area of a rectangle?

Answers may vary.

Math is... Mindset

How did you show that you understood your partner's point of view?

Unit Review

Name _____

Vocabulary Review

Choose the correct word(s) to complete each sentence.

multiplication	square units
decompose	area
composite figure	unit square

- The **area** of a figure is the amount of surface inside the figure. You can find area by counting the number of square units that cover the figure with no overlaps or gaps. (Lesson 6-1)
- When you **decompose** a figure, you break it into parts. (Lesson 6-5)
- Square units** are used to measure area. (Lesson 6-1)
- A(n) **unit square** has side lengths of 1 unit. (Lesson 6-1)
- A(n) **composite figure** is made up of two or more figures. (Lesson 6-4)
- You can use the side lengths and **multiplication** to find the area of a rectangle. (Lesson 6-3)

Review

- How can you find the area of the rectangle using tiling and unit squares? Explain. (Lesson 6-1)



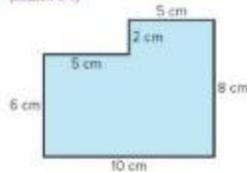
Sample answer: Tile the rectangle with unit squares with no gaps or overlaps. Create 7 rows of 10 unit squares. The area is 70 square units.

- Which equation can be used to determine the area of the rectangle? (Lesson 6-5)



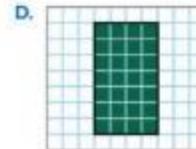
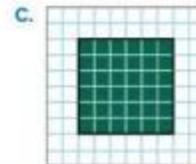
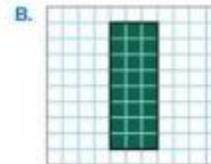
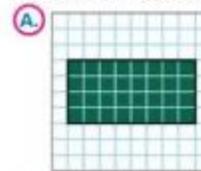
- $5 + 10 + 5 + 5 = ?$
- $5 \times 10 \times 5 \times 5 = ?$
- $5 \times 1 + 5 \times 5 = ?$
- $5 \times 10 + 5 \times 5 = ?$

- What is the area of the figure? (Lesson 6-4)

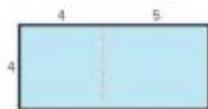


70 square centimeters

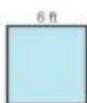
- Which rectangle has an area of 32 square units? (Lesson 6-2)



11. Which equations can be used to find the area of the figure? Choose all that apply. (Lesson 6-5)

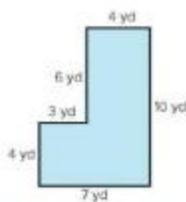


- A. $4 \times 4 \times 5 = ?$
 B. $4 \times 9 = ?$
 C. $4 \times 4 + 4 \times 9 = ?$
 D. $4 \times 4 + 4 \times 5 = ?$
 E. $4 + 9 = ?$
 F. $4 + 4 + 4 + 5 = ?$
12. How can you write an equation to find the area of the square? Explain. (Lesson 6-3)



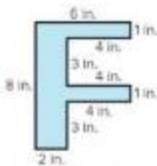
Sample answer: $6 \times 6 = 36$; Area = 36 square feet; I know a square has 4 equal sides so I know I can multiply 6 by 6.

13. Milan is putting carpet in a room. He measures the room. What is the area of the room? (Lesson 6-6)



52 square yards

14. Frank is making a block letter F for his name. How many square inches of paper does Frank need to make the F? (Lesson 6-6)



24 square inches

Performance Task

Sam is drawing plans for a room he is adding on to a house.

Part A: How can you explain the steps Sam needs to take to find the total area of the room?

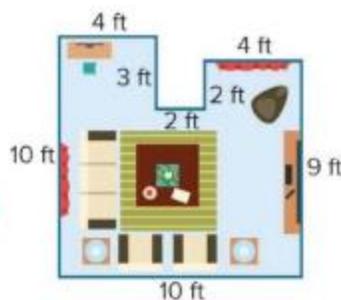
Sample answer: First, partition the figure into three rectangles. Next, find the area of each rectangle. Then, add the areas together to find the total area of the figure.

Part B: What equations can you use to find the area of the room?

Sample Answer: $4 \times 3 = 12$; $2 \times 4 = 8$; $7 \times 10 = 70$; $12 + 8 + 70 = 90$

Part C: Sam wants to cover the floor of the room with carpet. How many square feet of carpet does he need?

90 square feet



Reflect

How are area and multiplication related?

Answers may vary.

Fluency Practice

Name _____

Fluency Strategy

You can decompose by place value to subtract.

Decompose

$$498 - 257 = ?$$

$$\text{Decompose 257. } 257 = 200 + 50 + 7$$

$$\text{Subtract the hundreds. } 498 - 200 = 298$$

$$\text{Subtract the tens. } 298 - 50 = 248$$

$$\text{Subtract the ones. } 248 - 7 = 241$$

$$498 - 257 = 241$$

1. How can you decompose to find the difference?

$$763 - 421 = ?$$

$$421 = \underline{400} + \underline{20} + \underline{1}$$

$$763 - \underline{400} = 363$$

$$363 - \underline{20} = 343$$

$$343 - \underline{1} = \underline{342}$$

Fluency Flash

How can you write an equation to represent the base-ten blocks?

2. 

$$344 - 223 = 121$$

3. 

$$479 - 343 = 136$$

Fluency Check

How can you find the sum or difference?

- | | |
|------------------------------|------------------------------|
| 4. $496 - 135 =$ <u>361</u> | 11. $86 - 55 =$ <u>31</u> |
| 5. $858 - 624 =$ <u>234</u> | 12. $572 + 317 =$ <u>889</u> |
| 6. $997 - 265 =$ <u>732</u> | 13. $371 + 426 =$ <u>797</u> |
| 7. $142 + 256 =$ <u>398</u> | 14. $764 - 321 =$ <u>443</u> |
| 8. $284 + 112 =$ <u>396</u> | 15. $678 - 245 =$ <u>433</u> |
| 9. $98 - 24 =$ <u>74</u> | 16. $865 - 124 =$ <u>741</u> |
| 10. $569 - 451 =$ <u>118</u> | 17. $79 - 12 =$ <u>67</u> |

Fluency Talk

How would you decompose a number by place value to subtract two 3-digit numbers?

Sample answer: First, I write the number being subtracted in expanded form. Then I subtract the hundreds. Then I subtract the tens. Finally, I subtract the ones.

How does place value help you use partial sums to add two 3-digit numbers?

Sample answer: After I write the addends by place value, I can add the hundreds together, the tens together, and then the ones together. Then I add the partial sums.

Glossary/Glosario

English

Spanish/Español

Aa

area The amount of surface inside a 2-dimensional figure. Area can be measured by covering the region with unit squares.



área La cantidad de superficie dentro de una figura bidimensional. El área se puede medir cubriendo la región con unidades cuadradas.



Cc

compatible numbers Numbers in a problem or related numbers that are easy to work with mentally.

números compatibles Números en un problema o números relacionados que son fáciles de calcular mentalmente.

composite shape A composite shape is made up of two or more polygons.

figura compuesta Figura conformada por dos o más figuras.

Dd

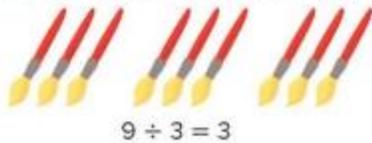
denominator The bottom number in a fraction.

In $\frac{5}{6}$, 6 is the denominator.

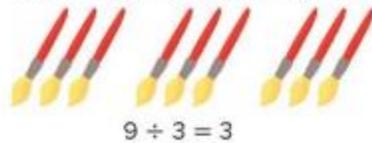
denominador El número inferior en una fracción.

En $\frac{5}{6}$, 6 es el denominador.

divide To separate into equal groups.



divider Separar en grupos iguales.



Ee

equal groups Groups that have the same number of objects.

grupos iguales Grupos que tienen el mismo número de objetos.

equal sharing Equal sharing means that objects are shared equally among groups.

reparto equitativo Compartir equitativamente significa que los objetos se comparten por igual entre grupos.

equivalent fractions Fractions that have the same value.

fracciones equivalentes Fracciones que tienen el mismo valor.

expanded form The representation of a number as a sum that shows the value of each digit.

forma desarrollada Representación de un número como una suma que muestra el valor de cada dígito.

Example: 536 is written as $500 + 30 + 6$.

Ejemplo: 536 se escribe como $500 + 30 + 6$.

Ff

factor(s) A number that divides a whole number evenly. Also a number that is multiplied by another number.

factor Número que divide exactamente a otro número entero. También es un número multiplicado por otro número.

$$3 \times 6 = 18$$

$$3 \times 6 = 18$$

fraction A number that represents equal parts of a whole or a set.

fracción Número que representa partes iguales de un entero o un conjunto.

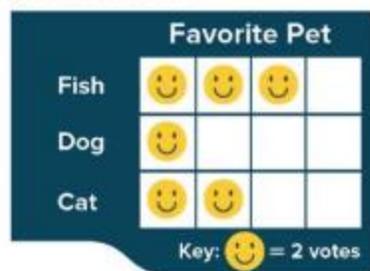
Gg

gram A metric unit for measuring mass.

gramo Una unidad métrica para medir masa.

Kk

key Tells what or how many each symbol stands for.



clave Indica qué significa o cuánto vale cada símbolo.



kilogram A metric unit for measuring mass.

1,000 grams

kilogramo Unidad métrica de masa.

1,000 gramos

LI

line plot A graph that uses columns of Xs above a number line to show frequency of data.

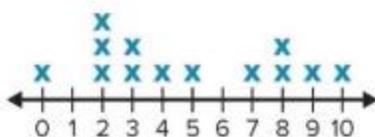
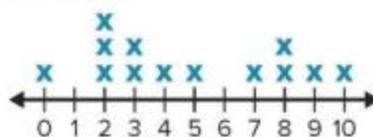


diagrama lineal Gráfica que usa columnas de X sobre una recta numérica para mostrar la frecuencia de los datos.



liquid volume The amount of liquid in a container.

volumen líquido La cantidad de líquido en un recipiente.

Mm

mass The amount of matter in an object. Two examples of units of measure would be pound and kilogram.

masa Cantidad de materia de un cuerpo. Dos ejemplos de unidades de medida son la libra y el kilogramo.

English**Spanish/Español**

multiple A multiple of a number is the product of that number and any whole number.

Example: 15 is a multiple of 5 because $3 \times 5 = 15$.

multiply To find the product of two or more numbers.

Example: $4 \times 3 = 12$. Four groups of three are equal to twelve. It can also be thought of as repeated addition: $3 + 3 + 3 + 3 = 12$.

múltiplo Un múltiplo de un número es el producto de ese número por cualquier otro número entero.

Ejemplo: 15 es múltiplo de 5 porque $3 \times 5 = 15$.

multiplicar Calcular el producto.

Ejemplo: $4 \times 3 = 12$. Cuatro grupos de tres son igual a doce. También se puede pensar como una suma repetida: $3 + 3 + 3 + 3 = 12$.

Nn

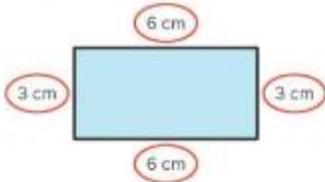
numerator The top number in a fraction; the part of the fraction that tells how many of the equal parts are being used.

numerador El número superior en una fracción; la parte de la fracción que indica cuántas partes iguales se están usando.

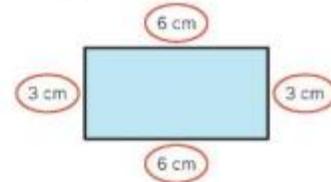
Pp

perimeter The distance around a shape or region.

perímetro Distancia alrededor de una figura o región.



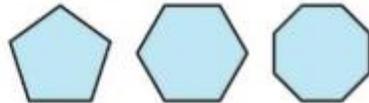
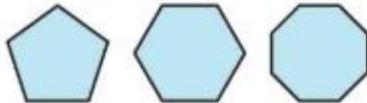
$$6 \text{ cm} + 3 \text{ cm} + 6 \text{ cm} + 3 \text{ cm} = 18 \text{ cm}$$



$$6 \text{ cm} + 3 \text{ cm} + 6 \text{ cm} + 3 \text{ cm} = 18 \text{ cm}$$

polygon A closed plane figure formed using line segments that meet only at their endpoints.

polígono Figura plana cerrada formada por segmentos de recta que sólo concurren en sus extremos.



English**Spanish/Español**

product The result of multiplying two or more numbers.

$$3 \times 4 = 12$$

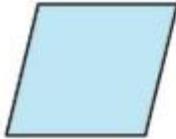


product El resultado de multiplicar dos o más números.

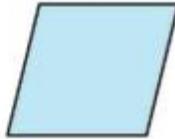
$$3 \times 4 = 12$$

**Rr**

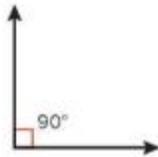
rhombus A quadrilateral with four sides of the same length.



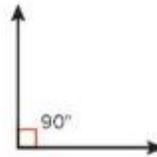
rombo El cuadrilátero con cuatro lados del mismo largo.



right angle An angle of a square corner (90°).



ángulo recto Ángulo que mide 90°.



round To change the value of a number to one that is easier to work with. To find the nearest value of a number based on a given place value.

Example: 27 rounded to the nearest ten is 30.

redondear Cambiar el valor de un número por uno con el que es más fácil trabajar.

Ejemplo: 27 redondeado a la décima más cercana es 30.

Ss

scale Equally spaced marks along an axis of a graph.

escala Conjunto de números igualmente separados en un lado de una gráfica.

scaled picture graph A scaled picture graph uses a symbol to represent more than one amount or value.

pictografía a escala La pictografía a escala usa símbolos para representar más de una cantidad o un valor.

Tt

thousands A place value of a number.

millares Valor de posición de un número.

Example: In the number 1,253, the 1 is in the thousands place.

Ejemplo: 1,253, el 1 está en el lugar de las unidades de millar.

time interval The time that passes from the start of an activity to the end of an activity.

intervalo de tiempo Tiempo que transcurre entre el comienzo y el final de una actividad.

Uu

unit fraction Any fraction with a numerator of 1.

fracción unitaria Cualquier fracción cuyo numerador es 1.

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$$

$$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$$

unknown factor The missing number, or the number to be solved for, in a multiplication equation.

incógnita El número faltante o el número que se debe hallar en una ecuación de multiplicación.