1–1 Class Activity

Name _____ Date _____

Vocabulary

equation

▶ Equal Groups

The students below do not remember how to find 4 × 8, but they know other multiplications. Help them find the answer by using what they already know.

8 8 2 × 8 = 16 Marco knows that 2 × 8 = 16. How can he find 4 × 8?	8 8 8 8 8 5 × 8 = 40 Hannah knows that 5 × 8 = 40. How can she find 4 × 8?
8 8 8 3 × 8 = 24 Alison knows that 3 × 8 = 24. How can she find 4 × 8?	7 7 7 7 4 × 7 = 28 Collin knows that 4 × 7 = 28. How can he find 4 × 8?

Tony and Anna do not remember how to find 24/4 (24 ÷ 4). Help them find the division answer by using what they know.

4 4 4 4 4 4 4 8 12 16 20 24 Tony knows how to count by fours. How can he find 24 ÷ 4?	4 4 4 4 4 5 × 4 = 20 Anna knows that there are 5 fours in 20. How can she find how many fours there are in 24?

Find the unknown number in each of the following equations.

1. 4 × 3 = _____
2. 7 × _____ = 28
3. 27 / 9 = _____
4. 30 ÷ 5 = _____
5. 9 • 3 = _____
6. 8 × _____ = 16
7. 6 × _____ = 18
8. 21 ÷ 7 = _____
9. 35 / 7 = _____

1–1 Class Activity

Name _____ Date _____

▶ Solve Word Problems

Write an equation for each word problem and solve the problem.

Show your work.

10. Tyler has 32 peaches. He wants to divide them equally among his 4 friends. How many peaches will each friend get?

_____

11. A guitar has 6 strings. If Trent has 4 complete packs of guitar strings, how many strings does he have in all?

_____

12. Ernesto's photograph album holds 6 pictures on each page. Ernesto has 48 pictures. How many pages will he fill?

_____

13. Rosa runs 3 miles every day. How many miles does she run in a week?

_____

14. Ali has a board 36 inches long. He wants to saw it into equal pieces 9 inches long. How many pieces will he get?

_____

15. Write and solve a multiplication and division word problem of your own.

_____

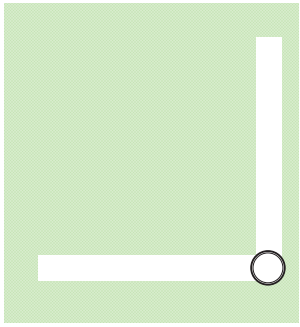
_____

_____

_____

Dear Family,

Your child has studied multiplication and division in past years but may not have reached total mastery. Unit 1 of *Math Expressions* guides students as they deepen and extend their knowledge. The main goals of this unit are
(1) to help students gain speed and accuracy in multiplying and dividing single-digit numbers
(2) to help students see how multiplication and division relate to real-world situations
(3) to introduce algebraic expressions and equations that feature these operations
(4) to begin exploring proportions.



Target

For the first goal, students discover patterns in the multiplication table that strengthen their understanding and also serve as memory aids. For example, knowing that the products of 9 form the pattern 10 – 1, 20 – 2, 30 – 3 (9, 18, 27) and so on is a memory aid, and knowing that the digits add up to 9 is a useful check. Students are given a variety of special materials that help them practice effectively. One tool that you will see coming home is the Target, which is used for individual practice. Ask your child to explain how it works, and encourage him or her to use it for a few minutes each day to practice those facts that still need to be mastered. Also have your child use the other practice materials that will come home.

The second goal, applying multiplication and division to real-world situations, is accomplished mainly through word problems. The various types of situations are described on the first page of your child's Student Activity Book. These include area, arrays, equal groups, comparisons, and combinations. Multiplication and division are not separated, but are treated together from the start so that students can see how these operations relate to each other.

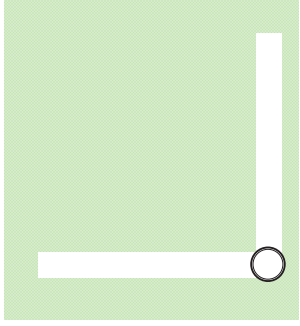
Puzzles. Students can solve these puzzles and also create them when they understand the relationships among all of these numbers. Proportional thinking will come into play again later as the class works with equivalent fractions, ratios, and similarity geometry.

If you have questions or problems, please contact me.

Sincerely,
Your child's teacher

Estimada familia:

En años anteriores, su niño ha estudiado la multiplicación y la división, pero es posible que necesite practicar un poco más. La Unidad 1 de *Math Expressions* guía a los estudiantes a medida que refuerzan y amplían sus conocimientos. Los objetivos principales de esta unidad son:
(1) ayudar a los estudiantes a adquirir rapidez y exactitud al multiplicar y dividir números de un dígito
(2) ayudar a los estudiantes a ver de qué manera están relacionadas la multiplicación y la división con situaciones de la vida real
(3) presentar expresiones algebraicas y ecuaciones que contienen estas operaciones
(4) empezar a explorar las proporciones



Objetivo

El primer objetivo se logra de varias maneras. Los estudiantes descubren, en la tabla de multiplicación, patrones que refuerzan sus conocimientos y que les ayudan a memorizar. Por ejemplo, saber que los productos de 9 forman el patrón 10 – 1, 20 – 2, 30 – 3 (9, 18, 27), y así sucesivamente, es una ayuda para memorizar. Además, saber que los dígitos suman 9 es una manera de comprobar. Los estudiantes reciben una variedad de materiales especiales que los ayudan a practicar de manera efectiva. Uno de los materiales que llevarán a casa es el *Objetivo*, el cual se usa para la práctica individual. Pida a su niño que explique cómo funciona, y anímelo a usarlo varios minutos cada día para practicar las operaciones que no domine. Pidale que use también los otros materiales de práctica que lleva a casa.

El segundo objetivo, aplicar la multiplicación y la división a situaciones de la vida real, se logra principalmente por medio de problemas verbales. Los diferentes tipos de situaciones se describen en la primera página del libro de su niño. Dichas situaciones incluyen área, matrices, grupos iguales, comparaciones y combinaciones. La multiplicación y la división se tratan de manera conjunta desde el principio, de modo que los estudiantes puedan ver cómo se relacionan entre sí.

Algunas situaciones de la vida real son demasiado complejas como para resolverlas sin recurrir al álgebra. El tercer objetivo, usar métodos algebraicos simples, se presenta por medio de problemas como éste:

Un camión transportó 6 sillas y una mesa que pesaba 40 libras. Juntas, las sillas y la mesa pesan 100 libras. ¿Cuánto pesa cada silla?

Ecuación:
$6C + 40 = 100$

Por último, se presentan las proporciones con casillas de factores, como se muestra en la ilustración de la derecha. Cuando un número es desconocido, éstas se llaman rompecabezas de factores. Los estudiantes pueden resolverlos y también crearlos cuando llegan a entender las relaciones entre todos estos números. Además, pensar en proporciones les servirá más adelante cuando la clase trabaje con fracciones equivalentes, razones y geometría de semejanzas.

3	18
5	

3	18
5	30

Si tiene alguna duda o comentario, por favor comuníquese conmigo.

Atentamente,
El maestro o la maestra de su niño o niña

1–2 Class Activity

Name _____ Date _____

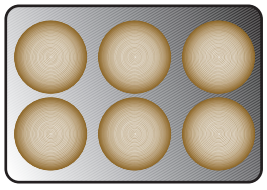
Vocabulary

array	column
row	area

▶ Discuss Arrays and Area

An **array** is a rectangular shape. The objects in an array could have spaces between them, like muffins in a tin, or they could be touching, like the squares in a quilt. An array has **rows** going across and **columns** going down.

We can find the total number in an array by multiplying the number of rows by the number of columns.

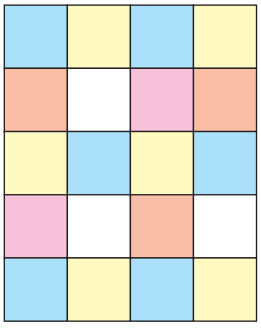


1. How many muffins are there on the tray?

_____

2. What equal groups do you see in the array of muffins?

_____



3. How many squares are there in the quilt?

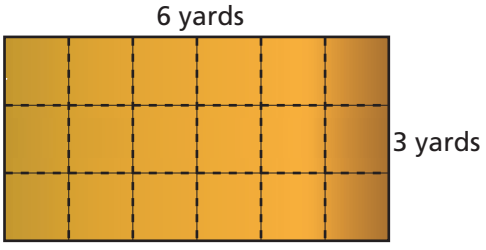
_____

4. What equal groups do you see in the quilt?

_____

Area is like an array. When we find the area of a rectangle, we find the number of square units that cover the rectangle. We don't usually see the square units.

The floor shown here is 6 yards long and 3 yards wide.

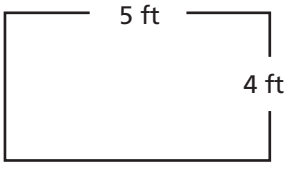


5. What is the area of this floor? _____

6. How should we label the answer? _____

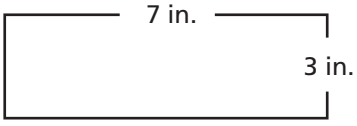
Find the area of each rectangle.

7.



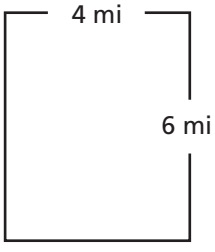
_____

8.



_____

9.



_____

1–2 Class Activity

Name _____ Date _____

▶ Applications for Real-World Situations

Decide if each word problem is an array, area, or equal groups situation. Then solve it.

Show your work.

10. A roller coaster with 7 identical cars can carry 42 people at the same time. How many people will each car carry?

_____

11. A package of stickers has 4 rows and 8 columns. How many stickers are there in the package?

_____

12. A porch is 9 feet long and 5 feet wide. What is the area of the porch?

_____

13. A little theater has 72 seats in all. There are 8 seats in each row. How many rows are there in the theater?

_____

14. A door is 7 feet tall. Its area is 21 square feet. How wide is the door?

_____

15. Lisa needs to buy 30 cans of apple juice for the class picnic. How many packages of 6 cans of apple juice should Lisa buy?

_____

16. A garden has an area of 36 square feet. It is 4 feet long. How wide is the garden?

_____

17. Mr. Brown bought a pack of 27 erasers. He can give his students 3 erasers each. How many students does he have?

_____

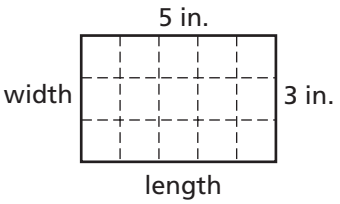
Name _____ Date _____

Vocabulary
length
width

▶ Use Letters for the Unknown Number

When you work with equations you can use a letter to represent an unknown number.

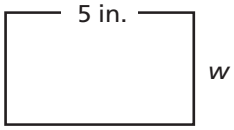
We know the length and width of this rectangle but we do not know its area. When we write an equation, we can use the letter *A* to represent the unknown area.



$5 \times 3 = A$

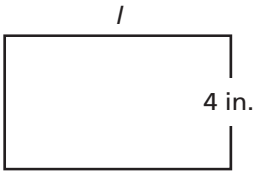
For this rectangle the **width** is unknown. We can use the letter *w* to represent the width.

$5 \times w = 15$ sq in.



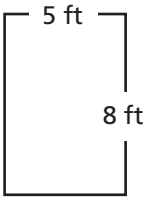
For this rectangle the **length** is unknown. We can use the letter *l* to represent the length.

$l \times 4 = 24$ sq in.



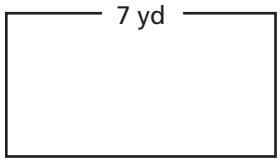
Write an equation for each rectangle below, using *A*, *w*, or *l* to represent the unknown number. Then find the unknown number.

18.



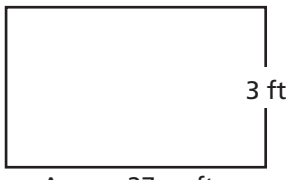
_____

19.



_____

20.



_____

The length and the width of each rectangle are whole numbers. How many different pairs of lengths and widths are there? List them.

21. $A = 21$

_____

22. $A = 24$

_____

23. $A = 16$

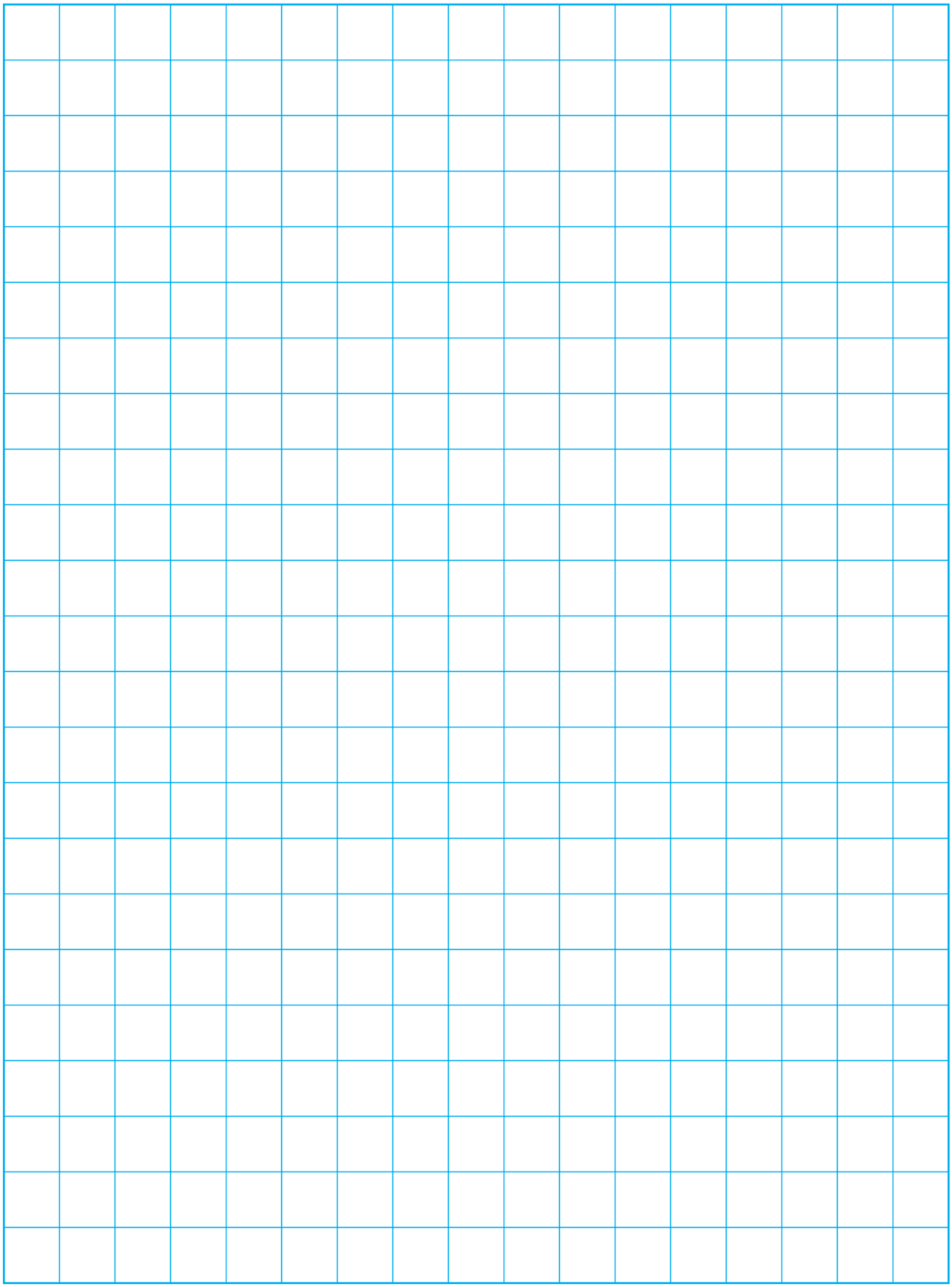
_____

24. $A = 13$

_____

25. On the Back Draw all the rectangles for exercise 23.

Name _____ **Date** _____



1–3 Class Activity

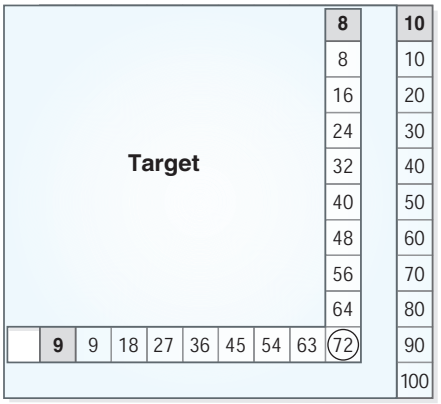
Name _____ Date _____

Vocabulary

Commutative Property
inverse operations

▶ Look for Patterns

Discuss the patterns in the Multiplication Table. Then use your Target with the Multiplication Table. Place it as shown.



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

Think about the Commutative Property and inverse operations as you solve each problem.

1. If $16 \times 5 = 80$, then what is 5×16?

_____

2. If $18 \times 7 = 126$, then what is $126 \div 7$?

_____

3. If $192 \div 16 = 12$, then what is $192 \div 12$?

_____

4. If $12 \times 8 = 96$ and $8 \times d = 96$, then what number is d?

_____

5. If $432 \div 18 = 24$, then what is 18×24?

_____

6. If $a \times b = c$, then what is $c \div b$?

_____

7. **Reasoning** Choose a problem above and explain how the Commutative Property helped you answer it. Choose another exercise and explain how inverse operations helped.

_____

_____

_____

1–3 Class Activity

Name _____ Date _____

Vocabulary

factor
product

▶ Complete a Multiplication Table

8. Look at the **factors** to complete the Multiplication Table. Leave blanks for the **products** you do not know.

×	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

9. Write the multiplications you need to practice.

1–4 Class Activity

Name _____ Date _____

Vocabulary

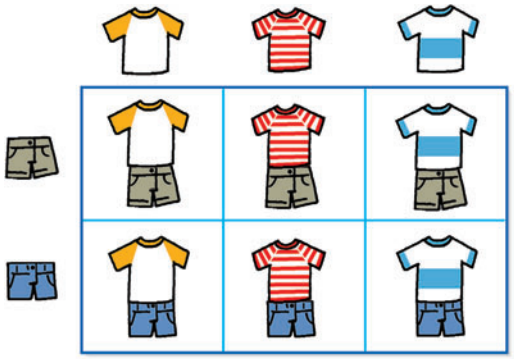
combination

▶ Discuss Combinations

Joel is taking 3 shirts and 2 pairs of shorts to camp.

How many different outfits can he put together? _____

A chart helps us see all of the **combinations**.



1. Write an equation. _____

Suppose we know that Joel has 6 different outfits for camp. He has 2 pairs of shorts and an unknown number of shirts.

2. How many shirts does he have? _____

3. Write an equation. _____

4. Can you think of another way to write the equation?

_____

5. A gift-wrapping counter has 6 kinds of wrapping paper and 3 kinds of ribbon. How many different combinations of paper and ribbon are possible?

_____

6. A cafe offers 32 different bagel combinations. If there are 4 kinds of spread, how many different bagels are there?

_____

7. Roberto wants to buy a new bicycle. The bicycles in the shop come in small, medium, and large. For each size, there is a choice of blue, red, black, and green. How many different kinds of bicycles are there to choose from?

_____

Show your work.

1–4 Class Activity

Name _____ Date _____

Vocabulary
product
factor

▶ Use Letters for the Unknown

Write an equation for each problem; then solve.

These equations have an unknown **product**.

8. What is p in these equations? _____
Can you think of other ways to write the equations?

_____

$6 \times 3 = p$
$p = 6 \times 3$

These equations have an unknown **factor**. Some are division and some are unknown multiplication.

9. What is f in these equations? _____
Can you think of other ways to write the equations?

_____

_____

$f = 18 \div 3$
$f = 18 / 3$
$3 \times f = 18$
$3 \cdot f = 18$

Another way to write unknown multiplication is without the multiplication sign. This form is used in algebra.

$3f = 18$

Solve each equation.

10. $7 \times 7 = a$
$a =$ _____

11. $b = 72 \div 8$
$b =$ _____

12. $4 \cdot 8 = c$
$c =$ _____

13. $63 \div 9 = d$
$d =$ _____

14. $6e = 48$
$e =$ _____

15. $30f = 60$
$f =$ _____

16. $90 \div 3 = g$
$g =$ _____

17. $2h = 50$
$h =$ _____

Write an equation for each word problem and solve it.

18. Hester and her friends are making kites. They have 7 colors of paper and 3 kinds of ribbon for the tail. How many different kites can they make? Let k stand for the unknown number of kites.

_____

19. Mr. Mason makes 4 sizes of toy trucks in several colors. Altogether there are 20 different trucks. How many colors are there? Let c stand for the unknown number of colors.

_____

1–4 Going Further

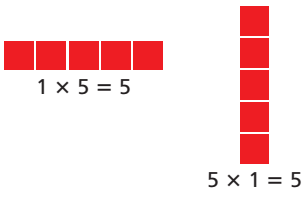
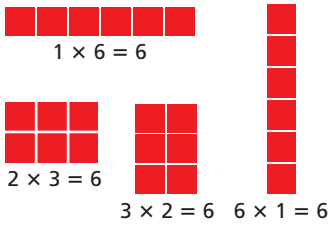
Name _____ Date _____

▶ Classify Numbers

Vocabulary
prime
composite

You can use factors to classify whole numbers into two groups: prime numbers and composite numbers. A **prime** number is a whole number that has only two factors—1 and itself. A **composite** number is a whole number that has more than two factors.

You can use arrays to determine if a number is prime or composite.

Prime Numbers	Composite Numbers
You can arrange 5 tiles in two different arrays.  The arrays show that 5 has only two factors: 1 and 5. So, 5 is a prime number.	You can arrange 6 tiles in four different arrays.  The arrays show that 6 has four factors: 1, 2, 3, and 6. So, 6 is a composite number.

List all the factors for each number. Then classify the number by writing *prime* or *composite* next to it.

1. 10 _____
Factors: _____

2. 7 _____
Factors: _____

3. 19 _____
Factors: _____

4. 8 _____
Factors: _____

5. 13 _____
Factors: _____

6. 25 _____
Factors: _____

7. 21 _____
Factors: _____

8. 11 _____
Factors: _____

9. 15 _____
Factors: _____

10. 12 _____
Factors: _____

11. 20 _____
Factors: _____

12. 23 _____
Factors: _____

13. On the Back Tell whether or not the number 1 is a prime number. Explain your thinking.

Name _____ **Date** _____

1–5 Class Activity

Name _____ Date _____

Vocabulary

comparison

▶ Comparisons With Unknown Numbers

You can use multiplication to solve **comparison** problems. All comparison problems involve a smaller amount and a larger amount.

1. There are 3 times as many deer as moose in the forest. If there are 5 moose, how many deer are there? *(The larger amount is unknown.)*

	$3 \times m$
Deer ($3m$)	
Moose (m)	5

_____

2. There are $\frac{1}{3}$ as many moose as deer in the forest. If there are 15 deer, how many moose are there? *(The smaller amount is unknown.)*

Deer (d)	15
Moose ($\frac{1}{3}d$)	
	$\frac{1}{3} \times d$

_____

3. There are 5 moose in the forest. There are 15 deer. How many times as many deer as moose are there? *(The multiplier is unknown.)*

	___ × m
Deer ($3m$)	15
Moose (m)	5

_____

4. Use the scoreboard to write 3 multiplication comparison word problems. Let each number be the unknown.

Red Team	Blue Team
6	24

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

1–5 Class Activity

Name _____ Date _____

▶ Solve Comparison Problems

Draw comparison bars, write an equation, and solve each problem.

Show your work.

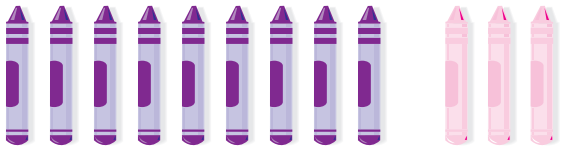
5. Farmer Ruiz has 6 times as many cows as goats. He has 7 goats. How many cows does he have?
Let c = the number of cows.

6. Nadia hiked 20 miles this weekend. Her sister Maria hiked only $\frac{1}{4}$ as many miles. How many miles did Maria hike?
Let m = the number of miles Maria hiked.

7. A baker made 35 apple pies today. He also made 7 peach pies. How many times as many apple pies as peach pies did he make?
Let t = how many times as many.

8. Nate practiced the trumpet for 10 hours last week. This week he practiced only $\frac{1}{5}$ as long. How long did Nate practice this week?
Let h = the number of hours Nate practiced this week.

9. How many times as many dark crayons are there as light crayons?
Let t = how many times as many.



1–5 Class Activity

Name _____ Date _____

▶ Comparisons and Graphs

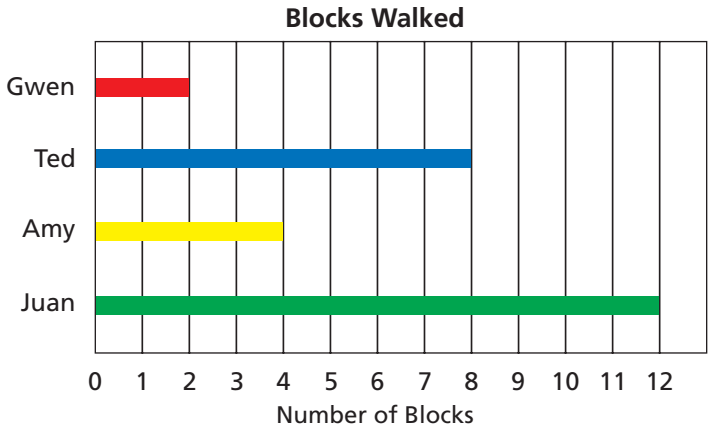
10. Brownville School and Highland School both bought new computers this year. Using multiplication, compare the number of computers the two schools bought. Express the comparison two ways.

Computers

Brownville	🖥🖥🖥🖥🖥🖥
Highland	🖥🖥

Key: Each 🖥 = 1 computer

11. The bar graph shows the number of blocks that four students walk to school. Write two multiplication comparison word problems about this bar graph.



12. On the Back First draw a vertical bar graph that shows the data in exercise 11. Then draw a pictograph for the same data. Let your icon equal 2 blocks.

Name _____ **Date** _____

1–6 Class Activity

Name _____ Date _____

Vocabulary

equal groups
array
area

▶ Write and Solve Situation Equations

You can multiply or divide to solve **equal groups** problems.

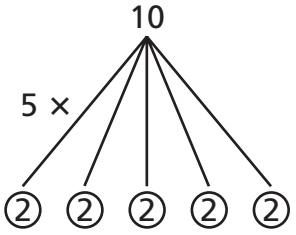
Write and solve an equation for each problem.

1. Amy has 5 cousins. She is making 2 puppets for each cousin. How many puppets will Amy need to make?

_____

2. Amy made 10 puppets to divide equally among her 5 cousins. How many puppets will each cousin get?

_____



3. Amy made 10 puppets for her cousins. Each cousin will get 2 puppets. How many cousins does Amy have?

_____

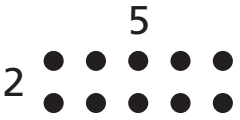
Things in an **array** are arranged in rows and columns.
The **area** of a figure is the number of square units that cover it.

4. A garden has 2 rows and 5 columns of bean plants. How many plants are there in all?

_____

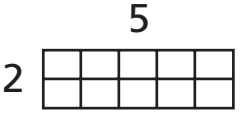
5. The garden is 2 yards wide and 5 yards long. What is its area?

_____



6. A garden has a total of 10 bean plants in 2 equal rows. How many columns does it have?

_____



7. The area of the garden is 10 square yards. It is 2 yards wide. How long is it?

_____

8. A garden has a total of 10 bean plants in 5 equal columns. How many rows does it have?

_____

1–6 Class Activity

Name _____ Date _____

Vocabulary

comparison
combination

▶ Comparisons and Combinations

Write and solve an equation for each problem.

Comparison problems always involve a larger number and a smaller number.

9. Bill has 2 apples. Kim has 5 times as many apples as Bill. How many apples does Kim have?

Bill (B) 

$B = \frac{1}{5} \times K$

Kim (K) 

$K = 5 \times B$

_____

10. Kim has 10 apples. Bill has $\frac{1}{5}$ as many apples as Kim. How many apples does Bill have?

_____

11. Bill has 2 apples. Kim has 10 apples. How many times as many apples does Kim have as Bill?

_____

You will use all possible pairs of fillings and breads to solve these **combination** problems.

12. Paco is making sandwiches on white bread and rye bread. The fillings are cheese, tuna, ham, peanut butter, and egg salad. How many combinations can he make?

	C	T	H	P	E
W	WC	WT	WH	WP	WE
R	RC	RT	RH	RP	RE

_____

13. Paco made 10 different sandwiches. He used 5 kinds of fillings. How many kinds of bread did he use?

_____

14. Paco made 10 different sandwiches. He used 2 kinds of bread. How many kinds of fillings did he use?

_____

1–7 Class Activity

Name _____ Date _____

▶ Patterns With 10s, 5s, and 9s

These grids help us see some patterns. Look at the numbers across, down, and on a diagonal.

10s

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

5s

1	11	21	31	41
2	12	22	32	42
3	13	23	33	43
4	14	24	34	44
5	15	25	35	45
6	16	26	36	46
7	17	27	37	47
8	18	28	38	48
9	19	29	39	49
10	20	30	40	50

1. What pattern do you see in the 10s count-bys?

_____

2. Look at the 5s and the 10s together. What patterns do you see?

_____

3. Look at the 9s count-bys. How does each 9s count-by relate to the 10s count-by in the same column?

_____

How could this pattern help you remember the 9s count-bys?

_____

_____

9s

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

4. Look at the digits in each 9s product. What is the sum of the digits in each 9s product?

_____

How could you use this knowledge to check your answers when you multiply by 9?

_____

Name _____ Date _____

▶ Patterns With Other Numbers

On these grids, find patterns with 2s, 4s, and 8s.

2s

1	11
2	**12**
3	13
4	**14**
5	15
6	**16**
7	17
8	**18**
9	19
10	**20**

4s

1	11	21	31
2	**12**	22	**32**
3	13	23	33
4	14	**24**	34
5	15	25	35
6	**16**	26	**36**
7	17	27	37
8	18	**28**	38
9	19	29	39
10	**20**	30	**40**

8s

1	11	21	31	41	51	61	71
2	12	22	**32**	42	52	62	**72**
3	13	23	33	43	53	63	73
4	14	**24**	34	44	54	**64**	74
5	15	25	35	45	55	65	75
6	**16**	26	36	46	**56**	66	76
7	17	27	37	47	57	67	77
8	18	28	38	**48**	58	68	78
9	19	29	39	49	59	69	79
10	20	30	**40**	50	60	70	**80**

5. Look at the ones digits in all the 2s, 4s, and 8s count-bys. What pattern do you see?

_____

6. Are the 2s, 4s, and 8s products even numbers or odd numbers?

_____

On these grids, look for patterns with 3s and 6s.

7. Look at the 3s and 6s count-bys together. What pattern do you see?

_____

_____

8. Look at the digits in each product. What is the sum of the digits in each of the products? Make a list. Write each different sum only once.

_____

3s

1	11	**21**
2	**12**	22
3	13	23
4	14	**24**
5	**15**	25
6	16	26
7	17	**27**
8	**18**	28
9	19	29
10	20	**30**

6s

1	11	21	31	41	51
2	**12**	22	32	**42**	52
3	13	23	33	43	53
4	14	**24**	34	44	**54**
5	15	25	35	45	55
6	16	26	**36**	46	56
7	17	27	37	47	57
8	**18**	28	38	**48**	58
9	19	29	39	49	59
10	20	**30**	40	50	**60**

Name _____ Date _____

▶ Patterns in the Zeros and Ones

Solve.

9. 8 × 0 = _____
10. 14 × 0 _____
11. 0 × 75 = _____
12. 0 ÷ 12 = _____
13. 0 × 98 = _____
14. 1 × _____ = 16
15. 68 × 1 = _____
16. 85 ÷ 1 = _____
17. 500 ÷ 1 = _____

18. What pattern do you find in the zeros?

_____

_____

19. What pattern do you find in the ones?

_____

_____

▶ Even-Odd Patterns

Solve.

20. If you multiply an odd number by an odd number, will the product be even or odd?

_____

21. If you multiply an even number by an even number, will the product be even or odd?

_____

22. If you multiply an even number by an odd number, will the product be even or odd?

_____

23. Which of these answers cannot be right? How do you know?

23 × 75 = 1,725 64 × 18 = 1,152 47 × 59 = 2,764

_____

_____

Name _____ Date _____

▶ The Puzzled Penguin

Help the Puzzled Penguin understand how Lucy did the mental math.

Dear Math Students,

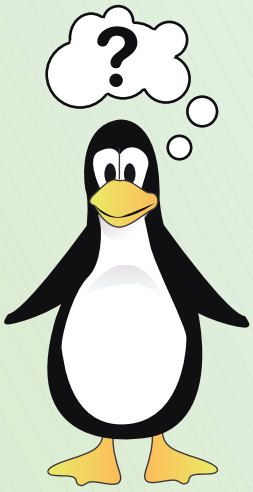
Today my friend Lucy and I sold lemonade for 5 cents a glass. When we were done, my friend said, "There are 24 nickels here, so we made $1.20."

"How did you figure that out so fast?" I asked.

Lucy answered, "I started by multiplying 24 by 10, and then I . . ."

At that moment Lucy heard her mother calling and had to leave. I can't figure out what Lucy did. Why would anyone start by multiplying by 10 when a nickel is worth only 5 cents? Can you explain Lucy's thinking?

Thanks for your help.
Puzzled Penguin



1–8 Class Activity

Name _____ Date _____

Vocabulary

function

▶ Input-Output Tables

A **function** is a rule that pairs each input with only one output. Functions can be shown in different ways. The table of input and output values at the right is one way to show a function.

The rule for the function table is *add 3* because every output is 3 more than its input. You can also write an equation as shown below the table. Write the output for the last row.

Rule: Add 3	
Input	Output
0	3
1	4
2	5
5	8
9	

$I + 3 = O$

Complete each table.

1.

Rule: Add 8	
Input	Output
1	9
2	
	11
4	
5	13

2.

Rule: Multiply by 5	
Input	Output
0	
6	30
8	40
9	
	20

For each table, write the rule and complete the table. Then write an equation.

3.

Rule:	
Input	Output
0	
2	8
3	12
4	16
	24

4.

Rule:	
Input	Output
7	14
2	
15	22
	10
11	18

1–8 Class Activity

Name Date

Vocabulary

variable

▶ Functions and Equations

Functions can describe many situations in your everyday life. The table below shows late fees for an overdue library book.

A function table will often contain variables. A **variable** is a letter that is used to represent a number.

We can represent the input (number of days late) by the variable *d* and the late fee by the variable *f*.

5. Write the rule in words and as an equation.

Rule in Words					
Equation					
Number of Days Late (*d*)	1	2	3	4	5
Late Fee (*f*)	10¢	20¢	30¢	40¢	50¢

For each function table, write the rule in words and as an equation. Then complete the table.

6.

Rule in Words					
Equation					
Bicycles (*b*)	1		3	4	5
Wheels (*w*)	2	4	6		10

7.

Rule in Words					
Equation					
Tricycles (*t*)	1	2		4	5
Wheels (*w*)	3	6	9		15

8.

Rule in Words					
Equation					
Tickets (*t*)	1	2	3	4	
Cost in dollars (*d*)	7	14		28	35

9.

Rule in Words					
Equation					
Inches of rain (*r*)	0	1		3	4
Inches of snow (*s*)	0	10	20	30	

Name _____ Date _____

▶ Add or Subtract from a Known Product

In each case, tell how you could find the unknown product.

1. You know 5 × 6 = 30, but don't know 6 × 6.

2. You know 5 × 8 = 40, but don't know 6 × 8.

3. You know 9 × 10 = 90, but don't know 9 × 9.

4. You know 7 × 7 = 49, but don't know 6 × 7.

5. You know 8 × 10 = 80, but don't know 8 × 11.

6. You know 6 × 12 = 72, but don't know 6 × 11.

Study the two tables.

5 × 6	30	5 sixes
6 × 6	30 + 6	5 sixes + 1 six
7 × 6	30 + 12	5 sixes + 2 sixes
8 × 6	30 + 18	5 sixes + 3 sixes
9 × 6	30 + 24	5 sixes + 4 sixes

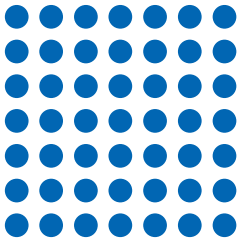
5 × 8	40	5 eights
6 × 8	40 + 8	5 eights + 1 eight
7 × 8	40 + 16	5 eights + 2 eights
8 × 8	40 + 24	5 eights + 3 eights
9 × 8	40 + 32	5 eights + 4 eights

7. What strategy do the tables show for multiplying 6s and 8s?

1–9 Class Activity

Name _____ Date _____

▶ Make New Factors



8. Look at the first array. Is 7 × 7 the same as 5 sevens + 2 sevens? _____
Mark the array to show that this is true.

9. How could you make new factors to solve 7 × 12?

_____

10. Look at the second array. Is 4 × 6 the same as 3 × 8? _____ Mark the array to show that this is true.

11. How could you make new factors to solve 18 × 3 quickly?

_____

Show how you could make new factors to solve the problems.

12. 7 × 13 _____

13. 16 × 4 _____

14. 12 × 5 _____

15. 14 × 4 _____

▶ Apply Various Strategies

Circle the name of the person who is right in each case. Explain why.

16. David says 9 × 6 is 54. Dana says it is 56. _____

17. David says 9 × 7 is 64. Dana says it is 63. _____

18. David says 8 × 7 is 56. Dana says it is 49. _____

19. David says 6 × 7 is 42. Dana says it is 52. _____

20. David says 8 × 5 is 45. Dana says it is 40. _____

21. David says 8 × 8 is 63. Dana says it is 64. _____

Name _____ Date _____

▶ Guess and Check

When you don't know how to think about solving a problem, you may want to guess an answer and check whether it is correct. You may have to guess more than once.

Samuel wanted to solve this problem: The product of two numbers is 24. Their sum is 11. What are the numbers?

Samuel decided to guess and check. He made this table to keep track of his guesses. When the answer to both "Check" questions is *yes,* Samuel will know he has found the answer. Complete the table to see how Samuel's guesses led to the answer.

First Guess: 6 and 5	Second Guess: 6 and 4	Third Guess: 8 and 3
Product: _____	Product: _____	Product: _____
Sum: _____	Sum: _____	Sum: _____
Check: Is the product 24? _____ Is the sum 11? _____	Check: Is the product 24? _____ Is the sum 11? _____	Check: Is the product 24? _____ Is the sum 11? _____

Use Guess and Check to solve each problem.

Show your work.

1. Together, Joan and Paul have 17 model cars. Joan has 5 more than Paul. How many cars does Paul have?

   _____

2. Beth and Ned have 24 trading cards altogether. Beth has twice as many as Ned. How many cards does Ned have?

   _____

3. The sum of 3 numbers is 10. Their product is 30.

   What are the numbers? _____

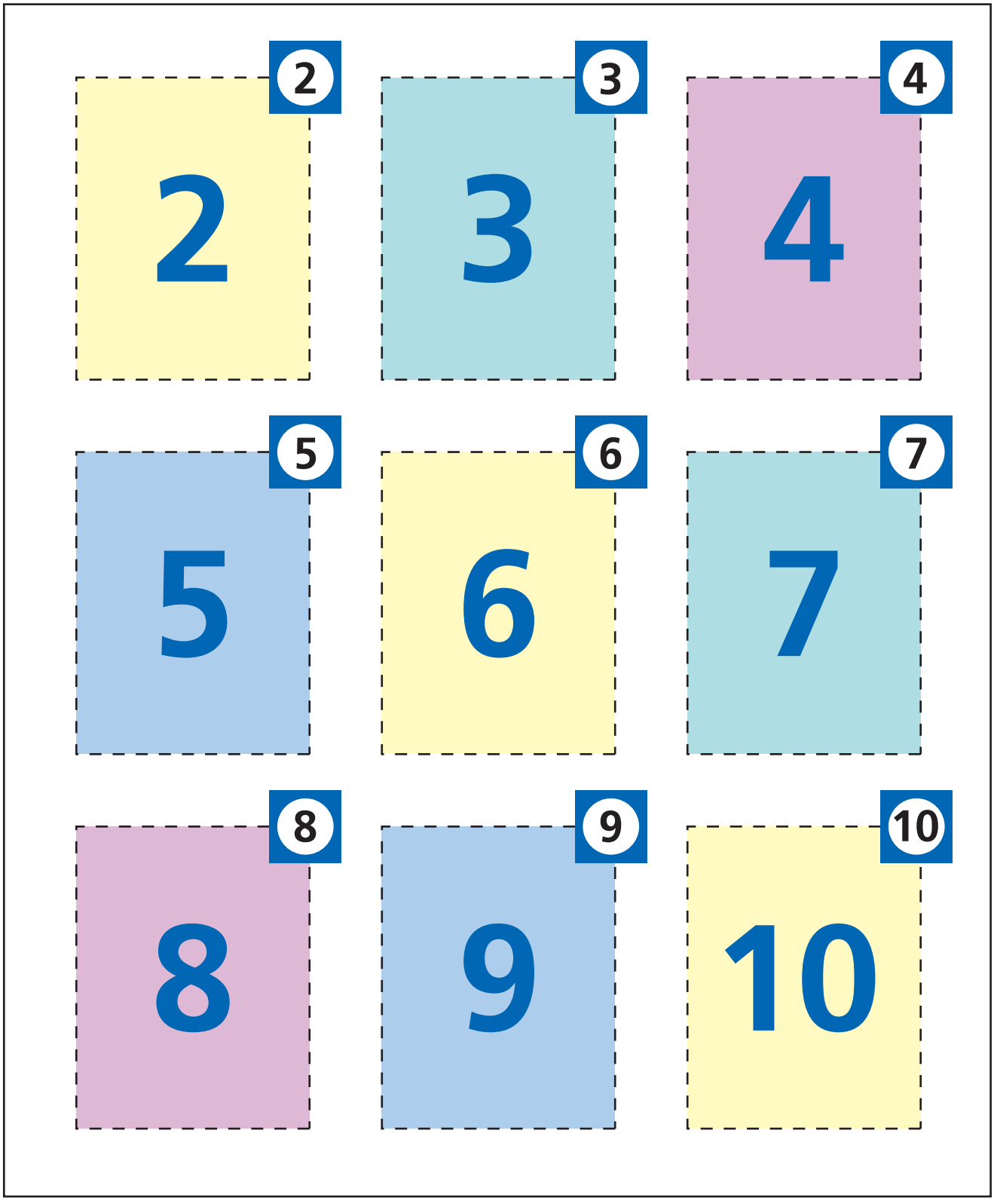
4. **On the Back** Write a problem that can be solved using Guess and Check. Show how to solve it.

Name _____ **Date** _____

1–10 Class Activity

Name _____ Date _____

▶ The Factor Field



Name _____ **Date** _____

$2\overline{)4}$ 2 × F = 4	$2\overline{)6}$ 2 * F = 6	$2\overline{)8}$ 2 • F = 8	$2\overline{)10}$ 2 × F = 10
$2\overline{)12}$ 2 * F = 12	$2\overline{)14}$ 2 • F = 14	$2\overline{)16}$ 2 × F = 16	$2\overline{)18}$ 2 * F = 18
$3\overline{)6}$ 3 • F = 6	$3\overline{)9}$ 3 × F = 9	$3\overline{)12}$ 3 * F = 12	$3\overline{)15}$ 3 • F = 15
$3\overline{)18}$ 3 × F = 18	$3\overline{)21}$ 3 * F = 21	$3\overline{)24}$ 3 • F = 24	$3\overline{)27}$ 3 × F = 27

$2\overline{)10}$ = 5 $2 \times 5 = 10$	$2\overline{)8}$ = 4 $2 \cdot 4 = 8$	$2\overline{)6}$ = 3 $2 * 3 = 6$	$2\overline{)4}$ = 2 $2 \times 2 = 4$
$2\overline{)18}$ = 9 $2 * 9 = 18$	$2\overline{)16}$ = 8 $2 \times 8 = 16$	$2\overline{)14}$ = 7 $2 \cdot 7 = 14$	$2\overline{)12}$ = 6 $2 * 6 = 12$
$3\overline{)15}$ = 5 $3 \cdot 5 = 15$	$3\overline{)12}$ = 4 $3 * 4 = 12$	$3\overline{)9}$ = 3 $3 \times 3 = 9$	$3\overline{)6}$ = 2 $3 \cdot 2 = 6$
$3\overline{)27}$ = 9 $3 \times 9 = 27$	$3\overline{)24}$ = 8 $3 \cdot 8 = 24$	$3\overline{)21}$ = 7 $3 * 7 = 21$	$3\overline{)18}$ = 6 $3 \times 6 = 18$

$4\overline{)8}$ 4 × F = 8	$4\overline{)12}$ 4 * F = 12	$4\overline{)16}$ 4 • F = 16	$4\overline{)20}$ 4 × F = 20
$4\overline{)24}$ 4 * F = 24	$4\overline{)28}$ 4 • F = 28	$4\overline{)32}$ 4 × F = 32	$4\overline{)36}$ 4 * F = 36
$5\overline{)10}$ 5 • F = 10	$5\overline{)15}$ 5 × F = 15	$5\overline{)20}$ 5 * F = 20	$5\overline{)25}$ 5 • F = 25
$5\overline{)30}$ 5 × F = 30	$5\overline{)35}$ 5 * F = 35	$5\overline{)40}$ 5 • F = 40	$5\overline{)45}$ 5 × F = 45

$4\overline{)20}$ = 5 4 × 5 = 20	$4\overline{)16}$ = 4 4 • 4 = 16	$4\overline{)12}$ = 3 4 * 3 = 12	$4\overline{)8}$ = 2 4 × 2 = 8
$4\overline{)36}$ = 9 4 * 9 = 36	$4\overline{)32}$ = 8 4 × 8 = 32	$4\overline{)28}$ = 7 4 • 7 = 28	$4\overline{)24}$ = 6 4 * 6 = 24
$5\overline{)25}$ = 5 5 • 5 = 25	$5\overline{)20}$ = 4 5 * 4 = 20	$5\overline{)15}$ = 3 5 × 3 = 15	$5\overline{)10}$ = 2 5 • 2 = 10
$5\overline{)45}$ = 9 5 × 9 = 45	$5\overline{)40}$ = 8 5 • 8 = 40	$5\overline{)35}$ = 7 5 * 7 = 35	$5\overline{)30}$ = 6 5 × 6 = 30

$6\overline{)12}$ 6 × F = 12	$6\overline{)18}$ 6 * F = 18	$6\overline{)24}$ 6 • F = 24	$6\overline{)30}$ 6 × F = 30
$6\overline{)36}$ 6 * F = 36	$6\overline{)42}$ 6 • F = 42	$6\overline{)48}$ 6 × F = 48	$6\overline{)54}$ 6 * F = 54
$7\overline{)14}$ 7 • F = 14	$7\overline{)21}$ 7 × F = 21	$7\overline{)28}$ 7 * F = 28	$7\overline{)35}$ 7 • F = 35
$7\overline{)42}$ 7 × F = 42	$7\overline{)49}$ 7 * F = 49	$7\overline{)56}$ 7 • F = 56	$7\overline{)63}$ 7 × F = 63

$6\overline{)30}$ = 5 6 × 5 = 30	$6\overline{)24}$ = 4 6 • 4 = 24	$6\overline{)18}$ = 3 6 * 3 = 18	$6\overline{)12}$ = 2 6 × 2 = 12
$6\overline{)54}$ = 9 6 * 9 = 54	$6\overline{)48}$ = 8 6 × 8 = 48	$6\overline{)42}$ = 7 6 • 7 = 42	$6\overline{)36}$ = 6 6 * 6 = 36
$7\overline{)35}$ = 5 7 • 5 = 35	$7\overline{)28}$ = 4 7 * 4 = 28	$7\overline{)21}$ = 3 7 × 3 = 21	$7\overline{)14}$ = 2 7 • 2 = 14
$7\overline{)63}$ = 9 7 × 9 = 63	$7\overline{)56}$ = 8 7 • 8 = 56	$7\overline{)49}$ = 7 7 * 7 = 49	$7\overline{)42}$ = 6 7 × 6 = 42

$8\overline{)16}$	$8\overline{)24}$	$8\overline{)32}$	$8\overline{)40}$
$8 \times F = 16$	$8 * F = 24$	$8 \cdot F = 32$	$8 \times F = 40$
$8\overline{)48}$	$8\overline{)56}$	$8\overline{)64}$	$8\overline{)72}$
$8 * F = 48$	$8 \cdot F = 56$	$8 \times F = 64$	$8 * F = 72$
$9\overline{)18}$	$9\overline{)27}$	$9\overline{)36}$	$9\overline{)45}$
$9 \cdot F = 18$	$9 \times F = 27$	$9 * F = 36$	$9 \cdot F = 45$
$9\overline{)54}$	$9\overline{)63}$	$9\overline{)72}$	$9\overline{)81}$
$9 \times F = 54$	$9 * F = 63$	$9 \cdot F = 72$	$9 \times F = 81$

$8\overline{)40}$ = 5 8 × 5 = 40	$8\overline{)32}$ = 4 8 • 4 = 32	$8\overline{)24}$ = 3 8 * 3 = 24	$8\overline{)16}$ = 2 8 × 2 = 16
$8\overline{)72}$ = 9 8 * 9 = 72	$8\overline{)64}$ = 8 8 × 8 = 64	$8\overline{)56}$ = 7 8 • 7 = 56	$8\overline{)48}$ = 6 8 * 6 = 48
$9\overline{)45}$ = 5 9 • 5 = 45	$9\overline{)36}$ = 4 9 * 4 = 36	$9\overline{)27}$ = 3 9 × 3 = 27	$9\overline{)18}$ = 2 9 • 2 = 18
$9\overline{)81}$ = 9 9 × 9 = 81	$9\overline{)72}$ = 8 9 • 8 = 72	$9\overline{)63}$ = 7 9 * 7 = 63	$9\overline{)54}$ = 6 9 × 6 = 54

$10\overline{)20}$ 10 × F = 20	$10\overline{)30}$ 10 * F = 30	$10\overline{)40}$ 10 • F = 40	$10\overline{)50}$ 10 × F = 50
$10\overline{)60}$ 10 * F = 60	$10\overline{)70}$ 10 • F = 70	$10\overline{)80}$ 10 × F = 80	$10\overline{)90}$ 10 * F = 90
$\overline{)\ \ }$ • F =	$\overline{)\ \ }$ × F =	$\overline{)\ \ }$ * F =	$\overline{)\ \ }$ • F =
$\overline{)\ \ }$ × F =	$\overline{)\ \ }$ * F =	$\overline{)\ \ }$ • F =	$\overline{)\ \ }$ × F =

$10\overline{)50}$ 5 10 × 5 = 50	$10\overline{)40}$ 4 10 • 4 = 40	$10\overline{)30}$ 3 10 * 3 = 30	$10\overline{)20}$ 2 10 × 2 = 20
$10\overline{)90}$ 9 10 * 9 = 90	$10\overline{)80}$ 8 10 × 8 = 80	$10\overline{)70}$ 7 10 • 7 = 70	$10\overline{)60}$ 6 10 * 6 = 60
) • =	) * =	) × =	) • =
) × =	) • =	) * =	) × =

Name _____ Date _____

▶ Multiplication Quiz

Solve.

1. 7 × 7 = ____
2. 3 • 1 = ____
3. 5 × 7 = ____
4. 8 × 4 = ____
5. 9 • 9 = ____
6. 6 × 2 = ____
7. 7 × 8 = ____
8. 6 • 4 = ____
9. 3 × 9 = ____
10. 0 × 4 = ____
11. 3 • 5 = ____
12. 8 * 7 = ____
13. 2 × 4 = ____
14. 5 × 4 = ____
15. 3 • 6 = ____
16. 4 × 7 = ____
17. 3 × 4 = ____
18. 2 • 9 = ____
19. 5 × 8 = ____
20. 3 × 0 = ____
21. 5 • 5 = ____
22. 3 × 7 = ____
23. 8 × 6 = ____
24. 9 • 8 = ____
25. 3 * 3 = ____
26. 2 × 5 = ____
27. 1 × 8 = ____
28. 6 • 8 = ____
29. 7 × 5 = ____
30. 9 × 6 = ____
31. 9 • 4 = ____
32. 4 × 3 = ____
33. 4 × 8 = ____
34. 9 • 3 = ____
35. 7 × 4 = ____
36. 8 × 5 = ____
37. 3 • 2 = ____
38. 7 * 10 = ____
39. 5 × 6 = ____
40. 8 × 2 = ____
41. 9 • 5 = ____
42. 7 × 6 = ____
43. 4 × 4 = ____
44. 8 • 8 = ____
45. 6 × 7 = ____
46. 4 × 1 = ____
47. 8 • 3 = ____
48. 6 × 9 = ____
49. 7 × 2 = ____
50. 6 • 6 = ____
51. 9 * 7 = ____
52. 10 × 5 = ____

1–10 Class Activity

Name _____ Date _____

▶ Division Quiz

Solve.

1. 24 ÷ 8 = ____
2. 56 / 7 = ____
3. 35 ÷ 5 = ____
4. $\frac{32}{4}$ = ____
5. 81 ÷ 9 = ____
6. 64 / 8 = ____
7. 30 ÷ 6 = ____
8. $\frac{72}{9}$ = ____
9. 0 ÷ 4 = ____
10. 27 / 3 = ____
11. 15 ÷ 5 = ____
12. $\frac{12}{4}$ = ____
13. 49 ÷ 7 = ____
14. 18 ÷ 3 = ____
15. $\frac{12}{3}$ = ____
16. 18 ÷ 9 = ____
17. 40 / 5 = ____
18. 42 ÷ 6 = ____
19. $\frac{25}{5}$ = ____
20. 21 ÷ 3 = ____
21. 24 / 4 = ____
22. 35 ÷ 7 = ____
23. $\frac{2}{2}$ = ____
24. 28 ÷ 4 = ____
25. 9 / 3 = ____
26. 80 ÷ 8 = ____
27. 6 ÷ 1 = ____
28. 27 / 9 = ____
29. 63 ÷ 7 = ____
30. $\frac{8}{2}$ = ____
31. 6 ÷ 6 = ____
32. 42 / 7 = ____
33. 36 ÷ 4 = ____
34. $\frac{28}{7}$ = ____
35. 20 ÷ 4 = ____
36. 36 / 9 = ____
37. 21 ÷ 7 = ____
38. $\frac{15}{3}$ = ____
39. 54 ÷ 6 = ____
40. 45 ÷ 9 = ____
41. $\frac{0}{2}$ = ____
42. 16 ÷ 4 = ____
43. 36 / 6 = ____
44. 32 ÷ 8 = ____
45. $\frac{72}{8}$ = ____
46. 24 ÷ 3 = ____
47. 54 / 9 = ____
48. 10 ÷ 5 = ____
49. $\frac{18}{6}$ = ____
50. 56 ÷ 8 = ____
51. 63 / 9 = ____
52. 48 ÷ 6 = ____

Name _____ Date _____

▶ Share Solutions

Write 4 multiplication or division word problems for the class to solve. Write one problem for each of the 4 types shown below.

Equal Groups

Array or Area

Comparison

Combination

1–11 Class Activity

Name _____ Date _____

Vocabulary

factor
product

▶ Scrambled Multiplication Tables

The **factors** are at the side and top of each table.
The **products** are in the white boxes.

Complete each table.

A

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

B

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

C

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

D

×										
	48		42	12	36		18	6		30
	56	28		14		70	21		63	35
			70		60			10		50
		20	35		30		15	5	45	
	32			8		40			36	
	8	4		2			3	1		5
		8	14		12		6		18	10
	64		56		48	80	24	8		40
	72	36		18			27		81	
	24		21		18	30		3	27	

1–12 Class Activity

Name _____ Date _____

Vocabulary

equation
parentheses

▶ Discuss Grouping Situations

How much did each student spend at the school store? Write the equation and solve.

Show your work.

1. Michael: I bought an eraser for 6 cents and 2 magnets for 9 cents each.

   Equation: _____

   Answer: _____

2. Emma: I bought 3 markers for 8 cents each and a notebook for 10 cents.

   Equation: _____

   Answer: _____

3. Alan: I bought 4 pencils for 3 cents each and 4 pens for 6 cents each.

   Equation: _____

   Answer: _____

4. Lucy: I bought 3 calendars for 30 cents each. One was bent, so it cost 5 cents less.

   Equation: _____

   Answer: _____

▶ Solve Equations With Parentheses

Solve each equation. Remember to do the operations in parentheses first.

5. $(4 \times 3) - 5 = n$ $n =$ _____

6. $6 + (10 - 2) = b$ $b =$ _____

7. $(9 - 2) \times 4 = c$ $c =$ _____

8. $12 + (5 \times 2) = q$ $q =$ _____

9. $(8 \times 7) - 6 = p$ $p =$ _____

10. $6 + (2 \times 3 \times 4) = f$ $f =$ _____

11. $(5 - 2) \times 9 = v$ $v =$ _____

12. $(10 \times 10 \times 10) - 10 = z$ $z =$ _____

Name _____ Date _____

Write an equation for each problem. Then solve.

Show your work.

13. A peach orchard has 8 rows of 9 trees. An apple orchard has 6 rows of 7 trees. How many trees are in both orchards?

Equation: _____ **Answer:** _____

14. In all, 6 chairs and a table weigh 100 pounds. The table weighs 40 pounds. How much does each chair weigh?

Equation: _____ **Answer:** _____

15. A parking lot has 10 rows with spaces for 9 cars in each row. There are now 70 cars in the parking lot. How many empty spaces are there?

Equation: _____ **Answer:** _____

16. Lisa has 5 large bags with 8 oranges in each bag and some small bags with 3 oranges in each bag. Altogether she has 58 oranges. How many small bags of oranges does she have?

Equation: _____ **Answer:** _____

17. Rolando runs 5 miles every day. Stuart runs 2 miles every day. How much farther does Rolando run in a week than Stuart?

Equation: _____ **Answer:** _____

18. Caroline had 25 flowers. She put some of them in a large vase. Then she put 3 flowers each in 6 small vases. How many flowers are in the large vase?

Equation: _____ **Answer:** _____

19. Abdul and his brother can put 6 pictures on each page of their albums. Abdul's album has 8 pages, and his brother's has 5 pages. How many pictures will fit in both albums altogether?

Equation: _____ **Answer:** _____

1–13 Class Activity

Name _____ Date _____

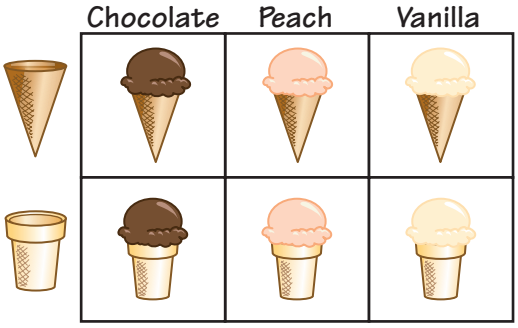
Vocabulary
combination

▶ Three-Way Combinations

A **combination** is a way of putting items together. You can find combinations in real-world situations.

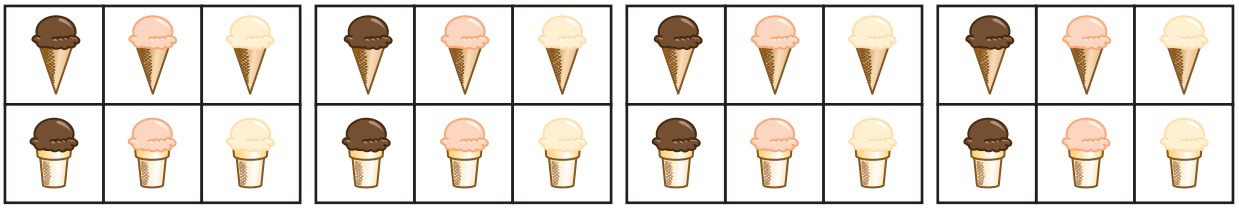
1. Bert's Frozen Yogurt Shop serves 3 kinds of yogurt on 2 kinds of cones. How many different combinations are possible? Write the equation.

_____



2. Today Bert's Frozen Yogurt Shop started selling 4 different toppings to put on top of the yogurt. Now how many combinations are possible? Write the equation.

_____



3. Toby's Frozen Yogurt Shop serves 4 kinds of frozen yogurt on 2 kinds of cones. This shop offers 3 kinds of toppings. Draw tables showing how many combinations are possible. Then write the equation.

_____

4. Teresa is making dolls. She has 2 outfits, 4 colors of yarn, and 5 choices of shoes. How many different combinations are possible?

_____

5. Armando is packing for vacation. He has 6 shirts, 3 pairs of shorts, and 2 pairs of shoes. How many different outfits can he make?

_____

Show your work.

1–13 Class Activity

Name _____ Date _____

Vocabulary
comparison

▶ Comparison Problems

Solve each comparison problem.

Show your work.

6. Maria scored 6 points in the basketball game. Suzanne scored 4 times as many points as Maria. How many points did Suzanne score?

_____

7. Ramon scored 10 points at the volleyball game. That was 5 times as many as David scored. How many points did David score? (Hint: Did David score more or fewer points than Ramon?)

_____

8. Ana has $15 in the bank. Her sister Benita has $\frac{1}{3}$ as much money in the bank. How much money does Benita have in the bank?

_____

9. Dana has 9 CDs. She has $\frac{1}{5}$ as many as Sonya. How many CDs does Sonya have?

_____

10. Mr. Wagner has 32 horses on his farm. He has 4 times as many horses as Mr. Cruz. How many horses does Mr. Cruz have?

_____

11. Chester has 49 CDs. Tony has $\frac{1}{7}$ as many as Chester. How many CDs does Tony have?

_____

12. A pizza restaurant offers 9 kinds of toppings and 2 kinds of crust. A small cafe offers $\frac{1}{3}$ as many types of pizza. How many fewer types of pizza does the small cafe offer?

_____

_____

Name _____ Date _____

▶ Strategies for Finding Factors

Write the missing numbers.

1. Table 1

×										
				12					27	
				28					*n*	

Factor Puzzle

12	27
28	*n*

n = _____

2. Table 2

×										
					10		14			
					n		42			

Factor Puzzle

10	14
n	42

n = _____

1–14 Class Activity

Name _____ Date _____

▶ Practice With Factors

Solve each Factor Puzzle.

3.

	14	35
		45

4.

15	40
18	

5.

14	6
42	

6.

40	
15	6

7.

72	27
16	

8.

18	
21	56

9.

30	
35	56

10.

10	
35	21

11.

	35
24	40

12.

63	36
21	

13.

30	
35	56

14.

	27
10	45

15.

8	16
12	

16.

63	81
28	

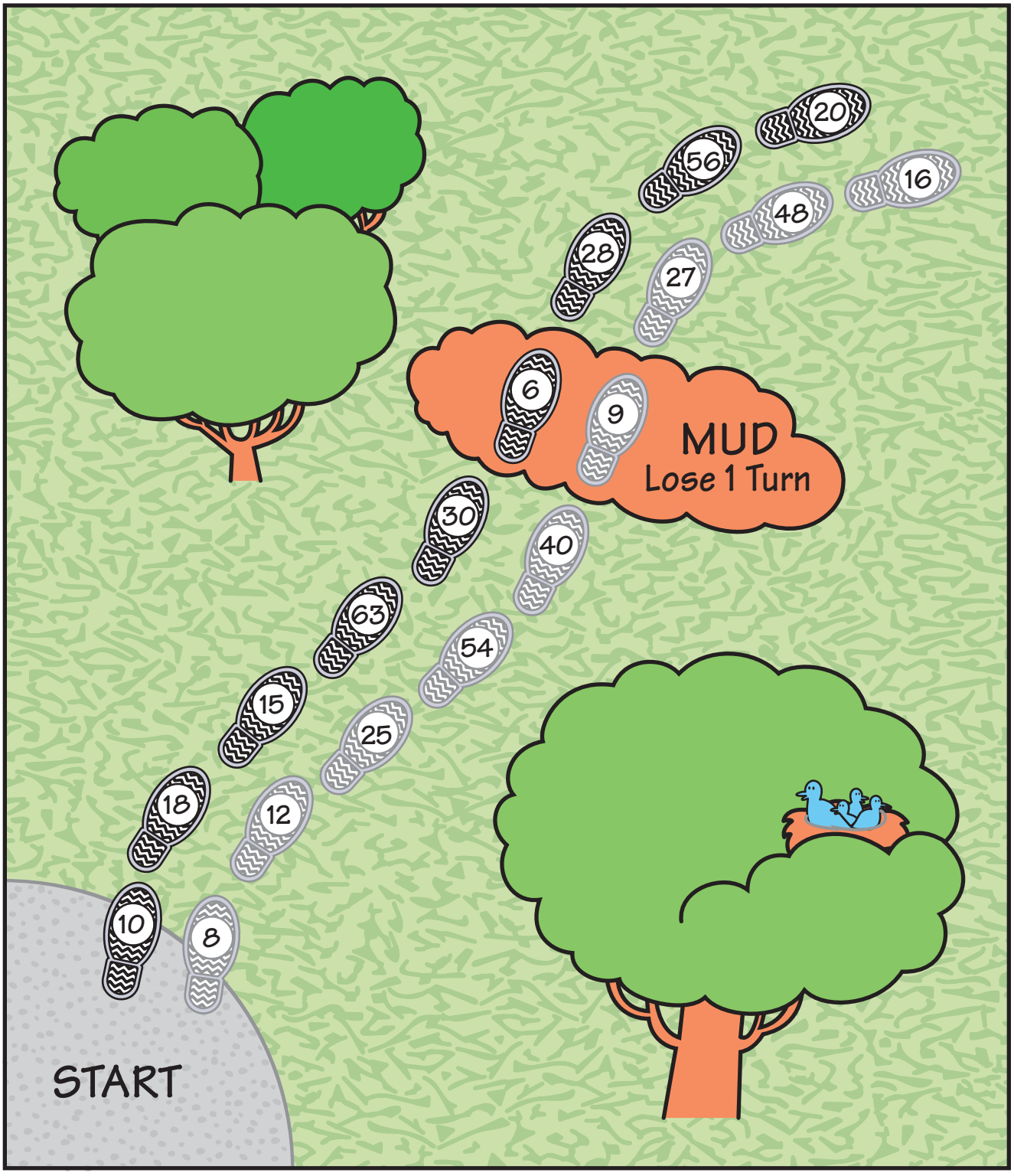
17.

5	10
25	

Name _____ Date _____

▶ Factor the Footprints (page 1)

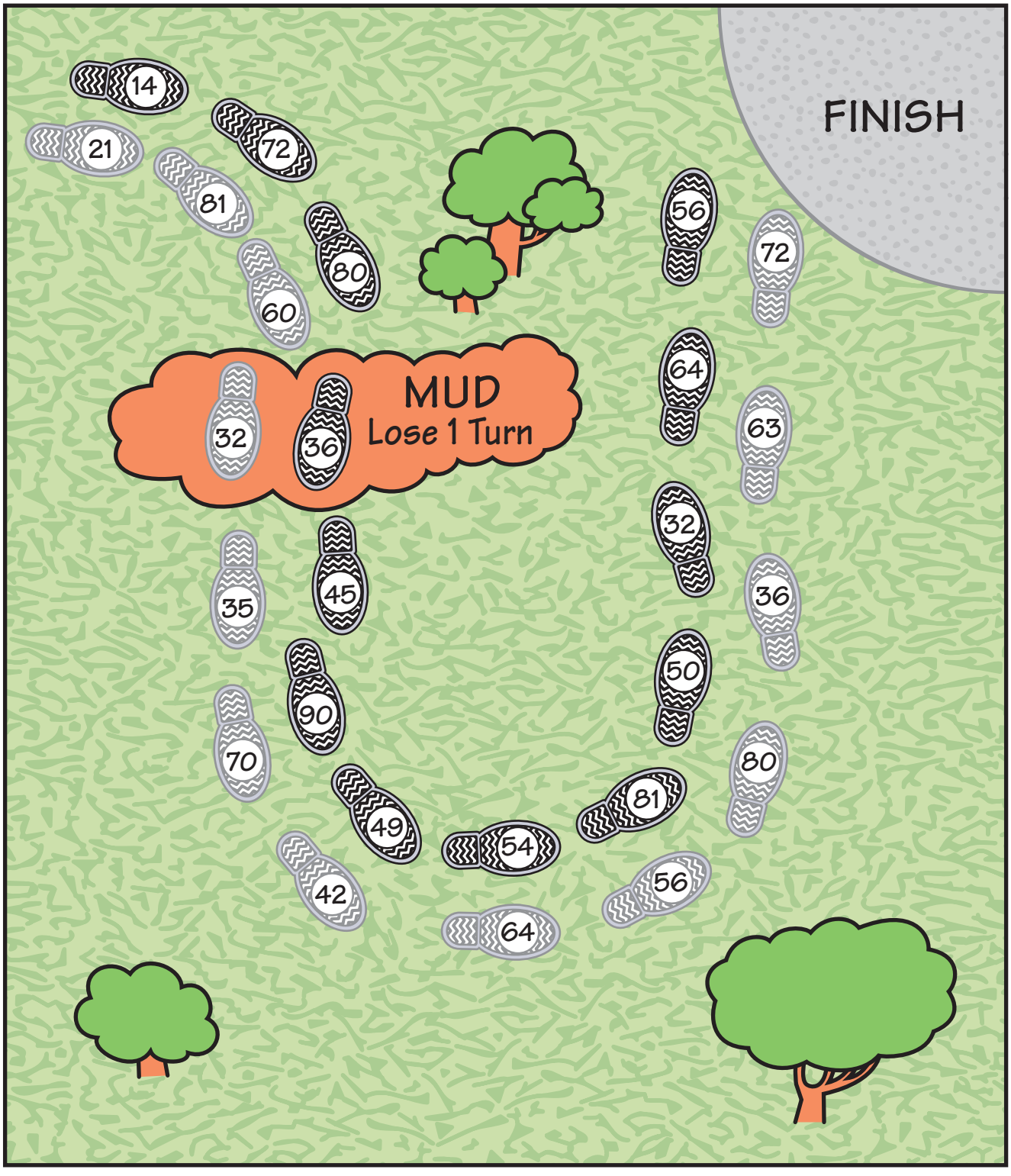
Cut out Student Activity Book pages 55 and 57 and tape them together to make a game board.



Name _____ **Date** _____

Name Date

▶ Factor the Footprints (page 2)



Name _____ **Date** _____

1–15 Class Activity

Name _____ Date _____

▶ Write Equations

The information given in each problem makes a comparison chain.

Solve.

Show your work.

1. Molly's family stayed at the cabin for 4 days. Then Tonio's family moved in and stayed there 3 times as long as Molly's family. After that, Jenny's family moved in and stayed 4 times as long as Molly's family. How many days did these families spend at the cabin altogether?

_____

_____

2. Fallbrook School has 5 computers. Mapleville School has twice as many computers as Fallbrook School. Pinewood School has 6 times as many computers as Mapleville School. How many computers do these schools have in all?

_____

_____

3. Toby made 2 paper airplanes today. His friend Justin made 5 times as many paper airplanes as Toby, and his friend Leo made 4 times as many paper airplanes as Toby. How many paper airplanes did the three friends make today?

_____

_____

▶ Algebraic Chains

Find the unknown number in each equation. Write a 1 in front of an unknown that is alone if it will help you.

4. $a + 3a = 36$ _____

5. $b + 4b + 2b = 28$ _____

6. $5c + c + 2c = 16$ _____

1–15 Class Activity

Name _____ Date _____

▶ Word Problems With Algebraic Chains

There are 3 times as many brown eggs as white eggs. Altogether there are 24 eggs. How many eggs are there of each kind?

Let w = the number of white eggs
Let $3w$ = the number of brown eggs

$w + 3w = 24$
$4w = 24$
$w =$ _____ white eggs
$3w =$ _____ brown eggs

You know there are 3 times as many brown eggs as white eggs. So you can show the white eggs as w and the brown eggs as $3w$.

Set up an equation.
Then solve and check your answer.
Do the numbers add up to 24?

Solve.

Show your work.

7. Joshua has 3 kinds of apples—red, green, and yellow. He has 4 times as many green apples as red and 2 times as many yellow apples as red. He has 28 apples in all. How many of each kind does he have?

_____

8. A rectangle has a perimeter of 24 m. Its length is 3 times longer than its width. How long is each side?

_____

9. A toy train has 20 cars—blue, purple, and orange. There are 4 times as many blue cars as purple cars. There are 5 times as many orange cars as purple cars. How many cars of each color are there?

_____

▶ Practice Algebraic Equations

Find the unknown number in each equation.

10. $5k + 2k = 42$
$k =$ _____

11. $8(3 \times 2) = p$
$p =$ _____

12. $z = (2 \times 9) + (3 \times 3)$
$z =$ _____

13. $\frac{1}{8}c = 5$
$c =$ _____

14. $20 \div r = 4$
$r =$ _____

15. $\frac{1}{3}m = 7$
$m =$ _____

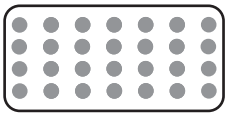
1–16 Class Activity

Name _____ Date _____

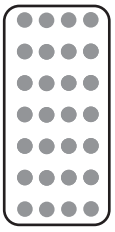
Vocabulary
Commutative Property
Associative Property
Expressions

▶ The Commutative Property

The arrays and equations at right show the **Commutative Property** of multiplication.



$4 \times 7 = 28$



$7 \times 4 = 28$

1. Explain the Commutative Property in your own words.

_____

_____

2. Is this property true of any two whole numbers that are multiplied together? How could you prove it?

_____

_____

Use the Commutative Property to find the unknown number *n* in these equations.

3. $57 \times 6 = 6 \times n$ $n =$ _____

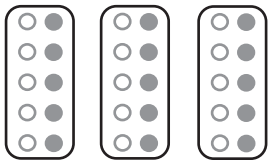
4. $n \times 5 = 5 \times 26$ $n =$ _____

5. $48 \times n = 7 \times 48$ $n =$ _____

▶ The Associative Property

The arrays and **expressions** at right show the **Associative Property** of multiplication.

$3 \times (5 \times 2) = (3 \times 5) \times 2$



$3 \times (5 \times 2)$

$(3 \times 5) \times 2$

6. Explain the Associative Property in your own words.

_____

_____

7. Do you think this property is true of any whole numbers that are multiplied together? Why or why not?

_____

_____

Simplify each expression.

$4 \times (2 \times 3)$ ____ $(4 \times 2) \times 3$ ____ $(4 \times 3) \times 2$ ____

8. Did you get the same answer each time? ____

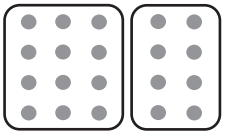
1–16 Class Activity

Name _____ Date _____

Vocabulary
Distributive Property

▶ The Distributive Property

These arrays and equations show the **Distributive Property**.



4 threes + 4 twos = 4 fives
(4 × 3) + (4 × 2) = 4 × (3 + 2)

9. How would you explain the word *distribute* as it relates to these equations?

_____

Multiplication can *distribute* over addition from the left or from the right.

Left: 8 × (5 + 2) = (8 × 5) + (8 × 2) **Right:** (5 + 2) × 4 = (5 × 4) + (2 × 4)

10. Are the two sides equal? _____

Write each problem with *one pair* of parentheses, then solve.

11. (6 × 3) + (6 × 4) = _____ **12.** (2 × 8) + (7 × 8) = _____

13. (9 × 5) + (9 × 2) = _____ **14.** (9 × 6) + (3 × 6) = _____

▶ Applications

Write the property of multiplication that best describes each situation.

15. Roberto did not know the answer to 13 × 5, so he found 10 fives and then added 3 more fives (10 × 5) + (3 × 5).

_____

16. Ethan discovered that a rectangle with sides that are 6 inches by 7 inches has the same area as a rectangle with sides that are 7 inches by 6 inches.

_____

17. Matty wants to find out how many outfits she can make with 4 pairs of jeans, 5 sweaters, and 2 shirts. She discovers that she can group these numbers in any order and still get the same answer: (4 × 5) × 2 or 4 × (5 × 2) or (4 × 2) × 5.

_____

1–16 Class Activity

Name Date

Vocabulary
example
counterexample

▶ Examples and Counterexamples

Commutative Property: $a \times b = b \times a$

Write an example to prove or a counterexample to disprove each statement.

18. Is addition commutative? Why or why not?

19. Is subtraction commutative? Why or why not?

20. Is division commutative? Why or why not?

Associative Property: $(a \times b) \times c = a \times (b \times c)$

21. Is addition associative? Why or why not?

22. Is subtraction associative? Why or why not?

23. Is division associative? Why or why not?

Distributive Property: $a \times (b + c) = (a \times b) + (a \times c)$

24. Is multiplication distributive over subtraction? Why or why not?

25. Is multiplication distributive over division? Why or why not?

26. On the Back Explain how the Identity Property of Addition and the Identity Property of Multiplication are alike and how they are different. Give an example of each.

Name _____ **Date** _____