



A STORY OF UNITS



Mathematics Curriculum



Grade 3 • MODULE 3

Multiplication and Division with Units of 0, 1, 6–9,
and Multiples of 10

PROBLEM SETS

Video tutorials: <http://embarc.online>

Version 3



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GRADE 3 • MODULE 3

Multiplication and Division with Units of 0, 1, 6–9, and Multiples of 10

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Name _____

Date _____

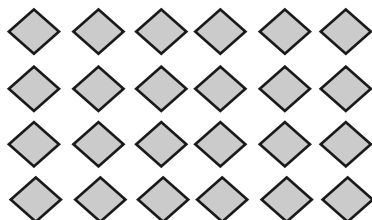
1. a. Solve. Shade in the multiplication facts that you already know. Then, shade in the facts for sixes, sevens, eights, and nines that you can solve using the commutative property.

×	1	2	3	4	5	6	7	8	9	10
1		2	3							
2		4		8				16		
3						18				
4					20					
5										50
6		12								
7										
8										
9										
10										

- b. Complete the chart. Each bag contains 7 apples.

Number of Bags	2		4	5	
Total Number of Apples		21			42

2. Use the array to write two different multiplication sentences.



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

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

3. Complete the equations.

a. 2 sevens = _____ twos

= $\frac{14}{\quad}$

g. $3 \times 9 = 10$ threes – _____ three

= _____

b. 3 _____ = 6 threes

= _____

h. 10 fours – 1 four = _____ $\times$ 4

= _____

c. 10 eights = 8 _____

= _____

i. $8 \times 4 = 5$ fours + _____ fours

= _____

d. $4 \times$ _____ = 6×4

= _____

j. _____ fives + 1 five = 6×5

= _____

e. $8 \times 5 =$ _____ $\times 8$

= _____

k. 5 threes + 2 threes = _____ $\times$ _____

= _____

f. _____ $\times 7 = 7 \times$ _____

= $\frac{28}{\quad}$

l. _____ twos + _____ twos = 10 twos

= _____

Name _____

Date _____

1. Each  has a value of 7.



Unit form: 5 _____

Facts: $5 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}} \times 5$

Total = _____



Unit form: 6 sevens = _____ sevens + _____ seven

= $35 + \underline{\hspace{1cm}}$

= _____

Facts: _____ $\times$ _____ = __________ $\times$ _____ = _____

2. a. Each dot has a value of 8



Unit form: 5 _____



Facts: $5 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}} \times 5$



Total = _____

- b. Use the fact above to find 8×6 . Show your work using pictures, numbers, or words.

3. An author writes 9 pages of her book each week. How many pages does she write in 7 weeks? Use a fives fact to solve.

-
4. Mrs. Gonzalez buys a total of 32 crayons for her classroom. Each pack contains 8 crayons. How many packs of crayons does Mrs. Gonzalez buy?

-
5. Hannah has \$500. She buys a camera for \$435 and 4 other items for \$9 each. Now Hannah wants to buy speakers for \$50. Does she have enough money to buy the speakers? Explain.

Name _____

Date _____

1. Each equation contains a letter representing the unknown. Find the value of the unknowns, and then write the letters that match the answers to solve the riddle.

$$5 \times 4 = e$$

$$e = \underline{\quad}$$

$$21 \div 3 = \ell$$

$$\ell = \underline{\quad}$$

$$24 \div i = 4$$

$$i = \underline{\quad}$$

$$32 = s \times 8$$

$$s = \underline{\quad}$$

$$21 = c \times 7$$

$$c = \underline{\quad}$$

$$8 = 80 \div n$$

$$n = \underline{\quad}$$

$$t \div 10 = 7$$

$$t = \underline{\quad}$$

$$4 = 36 \div k$$

$$k = \underline{\quad}$$

$$b = \underline{\quad}$$

$$24 \div b = 12$$

$$8 = a \div 3$$

$$a = \underline{\quad}$$

$$h = \underline{\quad}$$

$$35 = 7 \times h$$

Which tables do you NOT have to learn?

9

6

70

3

5

20

10

70

24

2

7

20

4

2. Lonna buys 3 t-shirts for \$8 each.
- What is the total amount Lonna spends on 3 t-shirts? Use the letter m to represent the total amount of money Lonna spends, and then solve the problem.
 - If Lonna hands the cashier 3 ten dollar bills, how much change will she receive? Use the letter c in an equation to represent the change, and then find the value of c .

3. Miss Potts used a total of 28 cups of flour to bake some bread. She used 4 cups of flour for each loaf of bread. How many loaves of bread did she bake? Represent the problem using multiplication and division sentences and a letter for the unknown. Then, solve the problem.

$$\underline{\hspace{1cm}} \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

$$\underline{\hspace{1cm}} \div \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

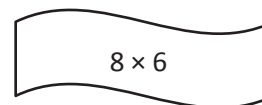
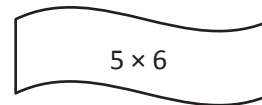
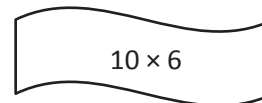
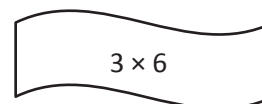
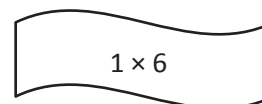
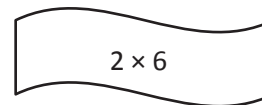
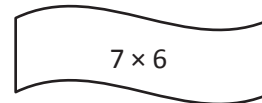
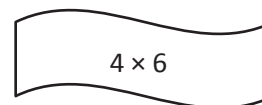
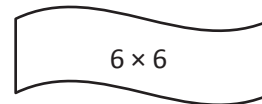
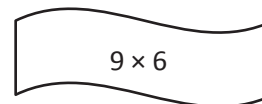
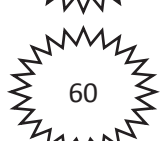
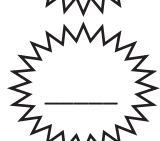
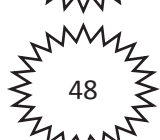
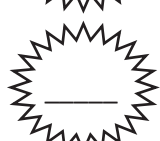
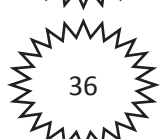
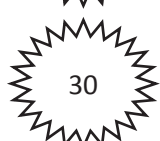
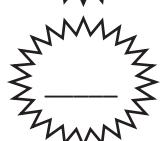
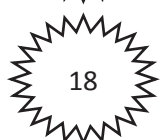
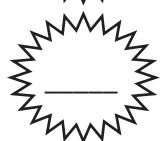
4. At a table tennis tournament, two games went on for a total of 32 minutes. One game took 12 minutes longer than the other. How long did it take to complete each game? Use letters to represent the unknowns. Solve the problem.

**CHALLENGE!**

Name _____

Date _____

1. Skip-count by six to fill in the blanks. Match each number in the count-by with its multiplication fact.



2. Count by six to fill in the blanks below.

6, _____, _____, _____

Complete the multiplication equation that represents the final number in your count-by.

$$6 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Complete the division equation that represents your count-by.

$$\underline{\hspace{2cm}} \div 6 = \underline{\hspace{2cm}}$$

3. Count by six to fill in the blanks below.

6, _____, _____, _____, _____, _____, _____

Complete the multiplication equation that represents the final number in your count-by.

$$6 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Complete the division equation that represents your count-by.

$$\underline{\hspace{2cm}} \div 6 = \underline{\hspace{2cm}}$$

4. Mrs. Byrne's class skip-counts by six for a group counting activity. When she points up, they count up by six, and when she points down, they count down by six. The arrows show when she changes direction.
- a. Fill in the blanks below to show the group counting answers.

↑ 0, 6, _____, 18, _____ ↓ _____, 12 ↑ _____, 24, 30, _____ ↓ 30, 24, _____ ↑ 24, _____, 36, _____, 48

- b. Mrs. Byrne says the last number that the class counts is the product of 6 and another number. Write a multiplication sentence and a division sentence to show she's right.

$$6 \times \underline{\hspace{2cm}} = 48$$

$$48 \div 6 = \underline{\hspace{2cm}}$$

5. Julie counts by six to solve 6×7 . She says the answer is 36. Is she right? Explain your answer.

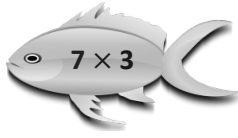
Name _____

Date _____

1. Skip-count by seven to fill in the blanks in the fish bowls. Match each count-by to its multiplication expression. Then, use the multiplication expression to write the related division fact directly to the right.



_____ ÷ 7 = _____



_____ ÷ 7 = _____



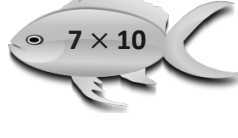
_____ ÷ 7 = _____



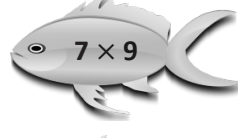
_____ ÷ 7 = _____



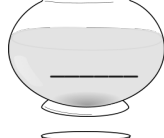
_____ ÷ 7 = _____



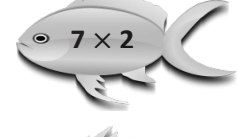
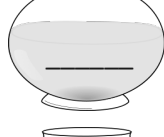
_____ ÷ 7 = _____



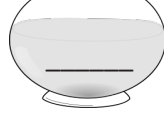
_____ ÷ 7 = _____



_____ ÷ 7 = _____



_____ ÷ 7 = _____



_____ ÷ 7 = _____

2. Complete the count-by seven sequence below. Then, write a multiplication equation and a division equation to represent each blank you filled in.

7, 14, _____, 28, _____, 42, _____, _____, 63, _____

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

b. _____ $\times$ 7 = _____ _____ $\div$ 7 = _____

c. _____ $\times$ 7 = _____ _____ $\div$ 7 = _____

d. _____ $\times$ 7 = _____ _____ $\div$ 7 = _____

e. _____ $\times$ 7 = _____ _____ $\div$ 7 = _____

-
3. Abe says $3 \times 7 = 21$ because 1 seven is 7, 2 sevens are 14, and 3 sevens are $14 + 6 + 1$, which equals 21. Why did Abe add 6 and 1 to 14 when he is counting by seven?

-
4. Molly says she can count by seven 6 times to solve 7×6 . James says he can count by six 7 times to solve this problem. Who is right? Explain your answer.

Name _____

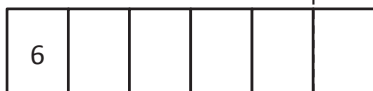
Date _____

1. Label the tape diagrams. Then, fill in the blanks below to make the statements true.

a. $6 \times 6 = \underline{\hspace{2cm}}$

$(5 \times 6) = \underline{\hspace{2cm}}$

$(\underline{\hspace{1cm}} \times 6) = \underline{\hspace{2cm}}$



$$\begin{aligned}
 (6 \times 6) &= (5 + 1) \times 6 \\
 &= (5 \times 6) + (1 \times 6) \\
 &= \underline{30} + \underline{\hspace{1cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

b. $7 \times 6 = \underline{\hspace{2cm}}$

$(5 \times 6) = \underline{\hspace{2cm}}$

$(\underline{\hspace{1cm}} \times 6) = \underline{\hspace{2cm}}$



$$\begin{aligned}
 (7 \times 6) &= (5 + 2) \times 6 \\
 &= (5 \times 6) + (2 \times 6) \\
 &= \underline{30} + \underline{\hspace{1cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

c. $8 \times 6 = \underline{\hspace{2cm}}$

$(5 \times 6) = \underline{\hspace{2cm}}$

$(\underline{\hspace{1cm}} \times 6) = \underline{\hspace{2cm}}$



$$\begin{aligned}
 8 \times 6 &= (5 + \underline{\hspace{1cm}}) \times 6 \\
 &= (5 \times 6) + (\underline{\hspace{1cm}} \times 6) \\
 &= \underline{30} + \underline{\hspace{1cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

d. $9 \times 6 = \underline{\hspace{2cm}}$

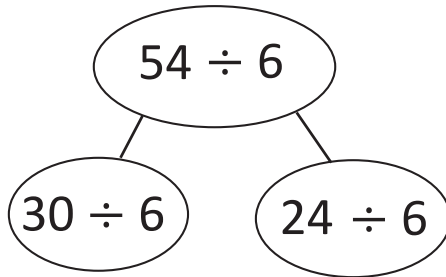
$(5 \times 6) = \underline{\hspace{2cm}}$

$(\underline{\hspace{1cm}} \times 6) = \underline{\hspace{2cm}}$



$$\begin{aligned}
 9 \times 6 &= (5 + \underline{\hspace{1cm}}) \times 6 \\
 &= (5 \times 6) + (\underline{\hspace{1cm}} \times 6) \\
 &= \underline{30} + \underline{\hspace{1cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

2. Break apart 54 to solve $54 \div 6$.

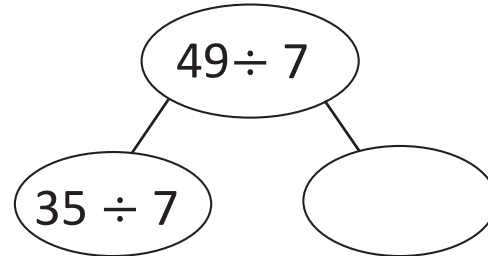


$$54 \div 6 = (30 \div 6) + (\underline{\hspace{2cm}} \div 6)$$

$$= 5 + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

3. Break apart 49 to solve $49 \div 7$.



$$49 \div 7 = (35 \div 7) + (\underline{\hspace{2cm}} \div 7)$$

$$= 5 + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

4. Robert says that he can solve 6×8 by thinking of it as $(5 \times 8) + 8$. Is he right? Draw a picture to help explain your answer.

5. Kelly solves $42 \div 7$ by using a number bond to break apart 42 into two parts. Show what her work might look like below.

Name _____

Date _____

1. Match the words to the correct equation.

a number times 6 equals 30



$$n \times 7 = 21$$

7 times a number equals 42



$$n \times 6 = 30$$

6 times 7 equals a number



$$6 \times 7 = n$$

63 divided by a number equals 9



$$7 \times n = 42$$

36 divided by a number equals 6



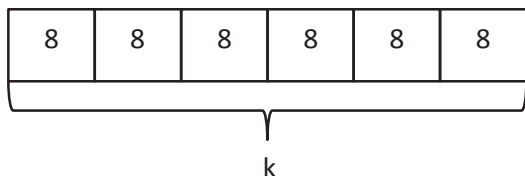
$$36 \div n = 6$$

a number times 7 equals 21



$$63 \div n = 9$$

2. Write an equation to represent the tape diagram below, and solve for the unknown.



Equation: _____

3. Model each problem with a drawing. Then, write an equation using a letter to represent the unknown, and solve for the unknown.
- Each student gets 3 pencils. There are a total of 21 pencils. How many students are there?
 - Henry spends 24 minutes practicing 6 different basketball drills. He spends the same amount of time on each drill. How much time does Henry spend on each drill?
 - Jessica has 8 pieces of yarn for a project. Each piece of yarn is 6 centimeters long. What is the total length of the yarn?
 - Ginny measures 6 milliliters of water into each beaker. She pours a total of 54 milliliters. How many beakers does Ginny use?

Name _____

Date _____

1. Solve.

a. $(12 - 4) + 6 = \underline{\hspace{2cm}}$

i. $\underline{\hspace{2cm}} = (12 \div 2) + 4$

b. $12 - (4 + 6) = \underline{\hspace{2cm}}$

j. $\underline{\hspace{2cm}} = 12 \div (2 + 4)$

c. $\underline{\hspace{2cm}} = 15 - (7 + 3)$

k. $9 + (15 \div 3) = \underline{\hspace{2cm}}$

d. $\underline{\hspace{2cm}} = (15 - 7) + 3$

l. $(9 + 15) \div 3 = \underline{\hspace{2cm}}$

e. $\underline{\hspace{2cm}} = (3 + 2) \times 6$

m. $60 \div (10 - 4) = \underline{\hspace{2cm}}$

f. $\underline{\hspace{2cm}} = 3 + (2 \times 6)$

n. $(60 \div 10) - 4 = \underline{\hspace{2cm}}$

g. $4 \times (7 - 2) = \underline{\hspace{2cm}}$

o. $\underline{\hspace{2cm}} = 35 + (10 \div 5)$

h. $(4 \times 7) - 2 = \underline{\hspace{2cm}}$

p. $\underline{\hspace{2cm}} = (35 + 10) \div 5$

2. Use parentheses to make the equations true.

a. $16 - 4 + 7 = 19$	b. $16 - 4 + 7 = 5$
c. $2 = 22 - 15 + 5$	d. $12 = 22 - 15 + 5$
e. $3 + 7 \times 6 = 60$	f. $3 + 7 \times 6 = 45$
g. $5 = 10 \div 10 \times 5$	h. $50 = 100 \div 10 \times 5$
i. $26 - 5 \div 7 = 3$	j. $36 = 4 \times 25 - 16$

3. The teacher writes $24 \div 4 + 2 = \underline{\hspace{2cm}}$ on the board. Chad says it equals 8. Samir says it equals 4. Explain how placing the parentheses in the equation can make both answers true.

4. Natasha solves the equation below by finding the sum of 5 and 12. Place the parentheses in the equation to show her thinking. Then, solve.

$12 + 15 \div 3 = \underline{\hspace{2cm}}$

5. Find two possible answers to the expression $7 + 3 \times 2$ by placing the parentheses in different places.

Name _____ Date _____

Solve the following pairs of problems. Circle the pairs where both problems have the same answer.

1. a. $7 + (6 + 4)$

b. $(7 + 6) + 4$

5. a. $(3 + 2) \times 5$

b. $3 + (2 \times 5)$

2. a. $(3 \times 2) \times 4$

b. $3 \times (2 \times 4)$

6. a. $(8 \div 2) \times 2$

b. $8 \div (2 \times 2)$

3. a. $(2 \times 1) \times 5$

b. $2 \times (1 \times 5)$

7. a. $(9 - 5) + 3$

b. $9 - (5 + 3)$

4. a. $(4 \times 2) \times 2$

b. $4 \times (2 \times 2)$

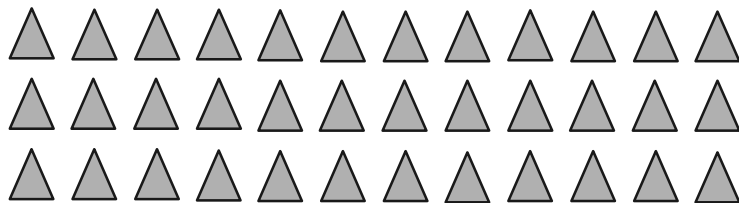
8. a. $(8 \times 5) - 4$

b. $8 \times (5 - 4)$

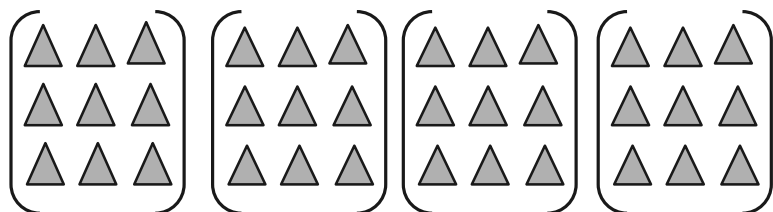
Name _____

Date _____

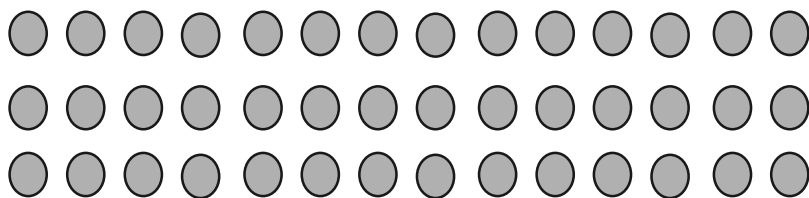
1. Use the array to complete the equation.



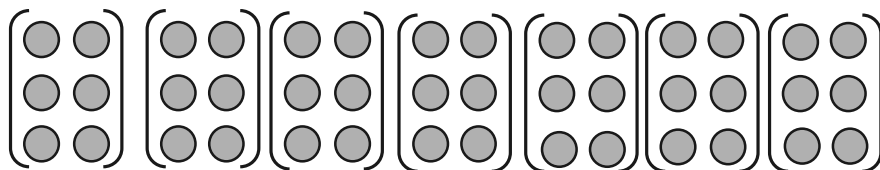
a. $3 \times 12 = \underline{\hspace{2cm}}$



b. $(3 \times 3) \times 4$
 $= \underline{\hspace{2cm}} \times 4$
 $= \underline{\hspace{2cm}}$



c. $3 \times 14 = \underline{\hspace{2cm}}$



d. $(\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}) \times 7$
 $= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$
 $= \underline{\hspace{2cm}}$

2. Place parentheses in the equations to simplify. Then, solve. The first one has been done for you.

a. $3 \times 16 = 3 \times (2 \times 8)$
 $= (3 \times 2) \times 8$
 $= \underline{6} \times 8$

48

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

c. $3 \times 12 = 3 \times (3 \times 4)$
 $= 3 \times 3 \times 4$
 $= \underline{\quad} \times \underline{\quad}$

d. $3 \times 14 = 3 \times 2 \times 7$
 $= 3 \times 2 \times 7$
 $= \underline{\quad} \times \underline{\quad}$

e. $15 \times 3 = 5 \times 3 \times 3$
 $= 5 \times 3 \times 3$
 $= \underline{\quad} \times \underline{\quad}$

f. $15 \times 2 = 5 \times 3 \times 2$
 $= 5 \times 3 \times 2$
 $= \underline{\quad} \times \underline{\quad}$

3. Charlotte finds the answer to 16×2 by thinking about 8×4 . Explain her strategy.

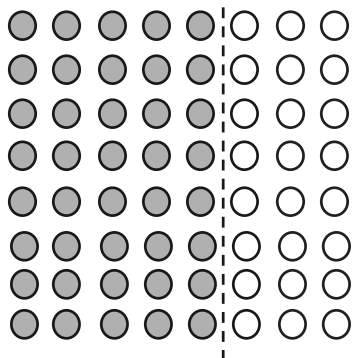
Name _____

Date _____

1. Label the arrays. Then, fill in the blanks below to make the statements true.

a. $8 \times 8 = \underline{\hspace{2cm}}$

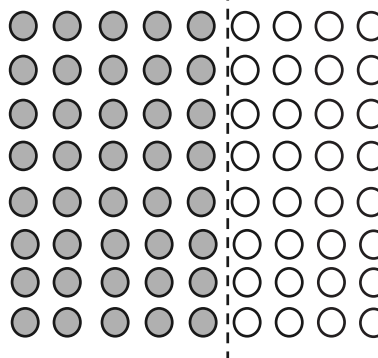
$(8 \times 5) = \underline{\hspace{2cm}} \quad (8 \times \underline{\hspace{2cm}}) = \underline{\hspace{2cm}}$



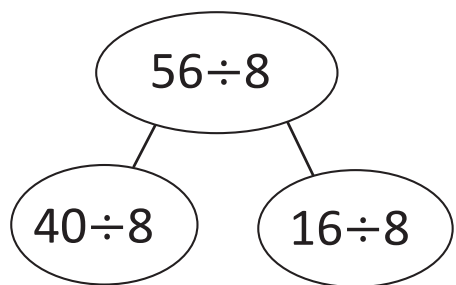
$$\begin{aligned}
 8 \times 8 &= 8 \times (5 + \underline{\hspace{1cm}}) \\
 &= (8 \times 5) + (8 \times \underline{\hspace{1cm}}) \\
 &= \underline{40} + \underline{\hspace{1cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

b. $8 \times 9 = 9 \times 8 = \underline{\hspace{2cm}}$

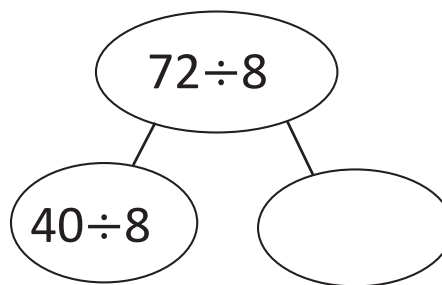
$(8 \times 5) = \underline{\hspace{2cm}} \quad (8 \times \underline{\hspace{2cm}}) = \underline{\hspace{2cm}}$



$$\begin{aligned}
 9 \times 8 &= 8 \times (5 + \underline{\hspace{1cm}}) \\
 &= (8 \times 5) + (8 \times \underline{\hspace{1cm}}) \\
 &= \underline{40} + \underline{\hspace{1cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

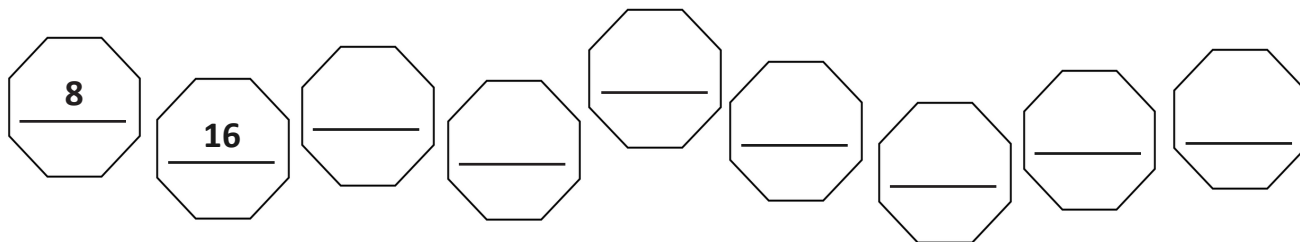
2. Break apart and distribute to solve $56 \div 8$.

$$\begin{aligned}
 56 \div 8 &= (40 \div 8) + (\underline{\hspace{2cm}} \div 8) \\
 &= 5 + \underline{\hspace{2cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

3. Break apart and distribute to solve $72 \div 8$.

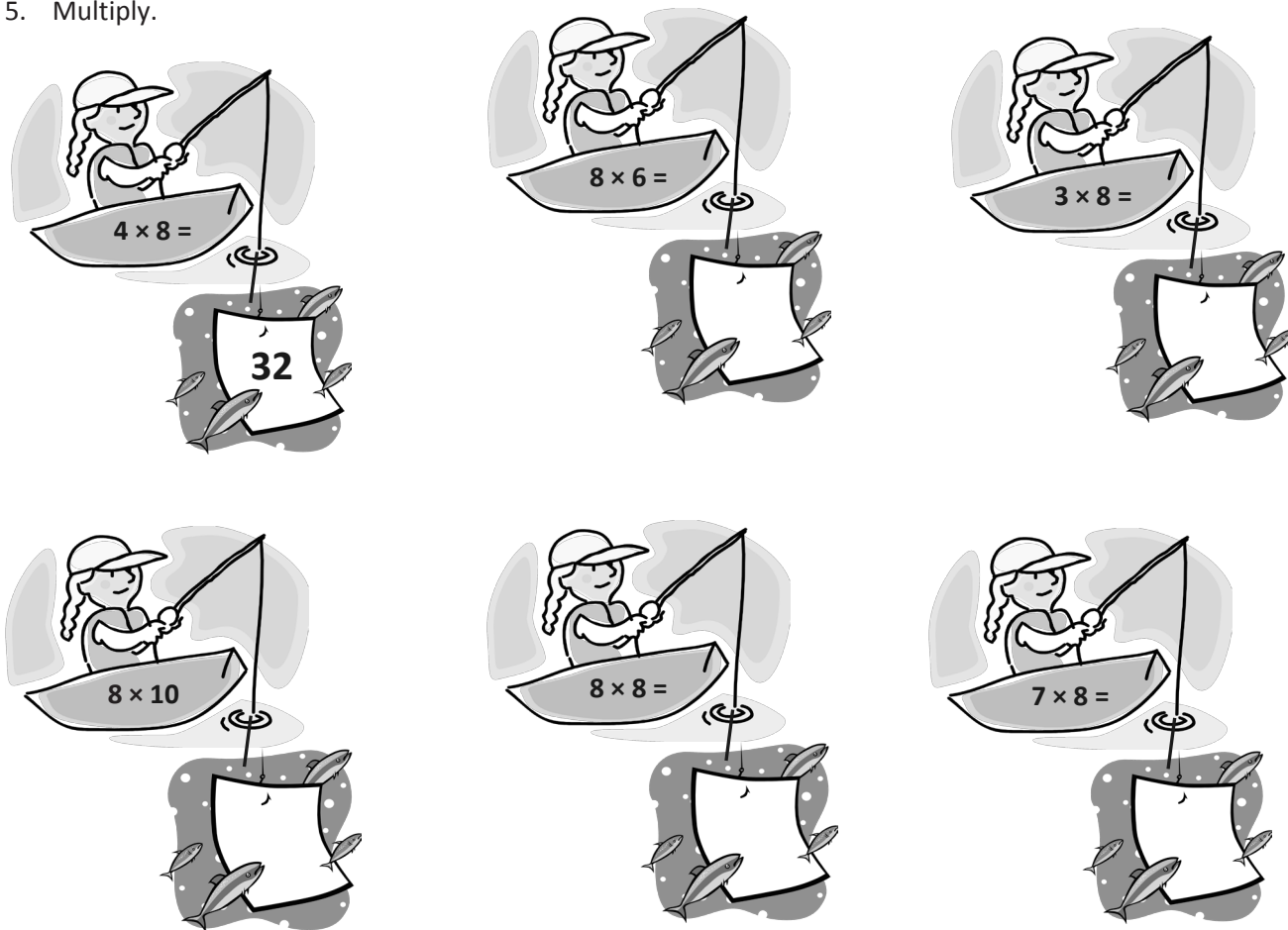
$$\begin{aligned}
 72 \div 8 &= (40 \div 8) + (\underline{\hspace{2cm}} \div 8) \\
 &= 5 + \underline{\hspace{2cm}} \\
 &= \underline{\hspace{2cm}}
 \end{aligned}$$

4. An octagon has 8 sides. Skip-count to find the total number of sides on 9 octagons.



Nine octagons have a total of _____ sides.

5. Multiply.



6. Match.

The image shows a matching exercise. On the left, there are six umbrellas, each with a division problem written on it. On the right, there are nine water droplets, each with a number written inside. A dashed line connects the first umbrella to the third droplet.

Umbrellas (left to right):

- $24 \div 8$
- $32 \div 8$
- $16 \div 8$
- $64 \div 8$
- $48 \div 8$
- $72 \div 8$

Water Droplets (top to bottom):

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Name _____

Date _____

1. Ms. Santor divides 32 students into 8 equal groups for a field trip. Draw a tape diagram, and label the number of students in each group as n . Write an equation, and solve for n .

-
2. Tara buys 6 packs of printer paper. Each pack of paper costs \$8. Draw a tape diagram, and label the total amount she spends as m . Write an equation, and solve for m .

-
3. Mr. Reed spends \$24 on coffee beans. How many kilograms of coffee beans does he buy? Draw a tape diagram, and label the total amount of coffee beans he buys as c . Write an equation, and solve for c .



4. Eight boys equally share 4 packs of baseball cards. Each pack contains 10 cards. How many cards does each boy get?

-
5. There are 8 bags of yellow and green balloons. Each bag contains 7 balloons. If there are 35 yellow balloons, how many green balloons are there?

-
6. The fruit seller packs 72 oranges into bags of 8 each. He sells all the oranges at \$4 a bag. How much money did he receive?

Name _____

Date _____

1. Each  has a value of 9. Find the value of each row. Then, add the rows to find the total.

a. $6 \times 9 = \underline{\hspace{2cm}}$



$5 \times 9 = 45$



$1 \times 9 = \underline{\hspace{2cm}}$

$$\begin{aligned} 6 \times 9 &= (5 + 1) \times 9 \\ &= (5 \times 9) + (1 \times 9) \\ &= 45 + \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

b. $7 \times 9 = \underline{\hspace{2cm}}$



$5 \times 9 = 45$



$\underline{\hspace{2cm}} \times 9 = \underline{\hspace{2cm}}$

$$\begin{aligned} 7 \times 9 &= (5 + \underline{\hspace{2cm}}) \times 9 \\ &= (5 \times 9) + (\underline{\hspace{2cm}} \times 9) \\ &= 45 + \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

c. $8 \times 9 = \underline{\hspace{2cm}}$



$5 \times 9 = \underline{\hspace{2cm}}$



$\underline{\hspace{2cm}} \times 9 = \underline{\hspace{2cm}}$

$$\begin{aligned} 8 \times 9 &= (5 + \underline{\hspace{2cm}}) \times 9 \\ &= (5 \times 9) + (\underline{\hspace{2cm}} \times \underline{\hspace{2cm}}) \\ &= 45 + \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

d. $9 \times 9 = \underline{\hspace{2cm}}$



$5 \times 9 = \underline{\hspace{2cm}}$

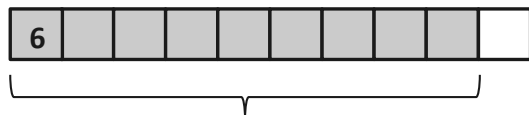


$\underline{\hspace{2cm}} \times 9 = \underline{\hspace{2cm}}$

$$\begin{aligned} 9 \times 9 &= (5 + \underline{\hspace{2cm}}) \times 9 \\ &= (5 \times 9) + (\underline{\hspace{2cm}} \times \underline{\hspace{2cm}}) \\ &= 45 + \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

2. Find the total value of the shaded blocks.

a. $9 \times 6 =$

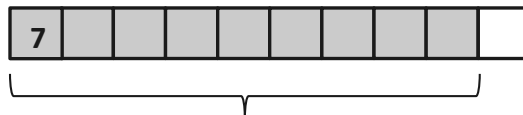


9 sixes = 10 sixes – 1 six

= _____ – 6

= _____

b. $9 \times 7 =$

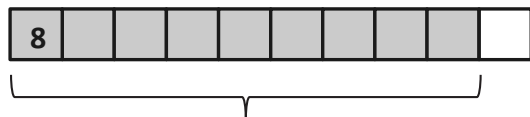


9 sevens = 10 sevens – 1 seven

= _____ – 7

= _____

c. $9 \times 8 =$

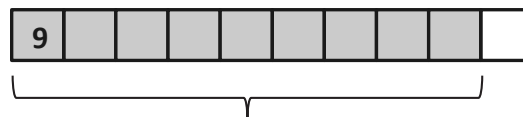


9 eights = 10 eights – 1 eight

= _____ – 8

= _____

d. $9 \times 9 =$



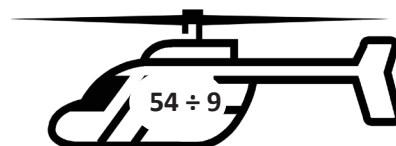
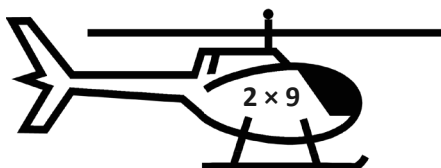
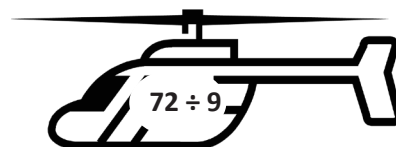
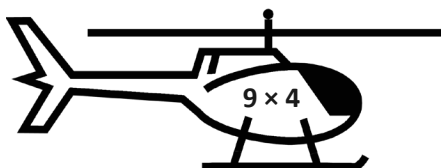
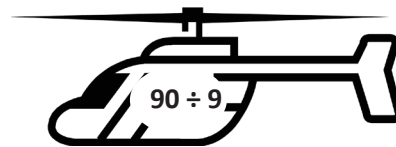
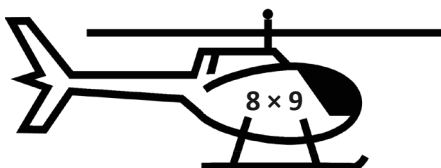
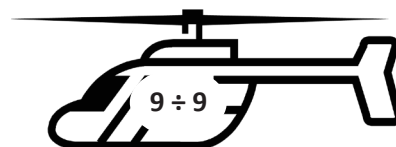
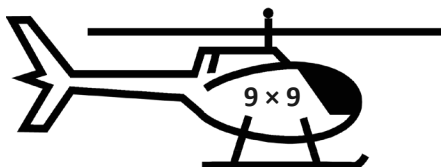
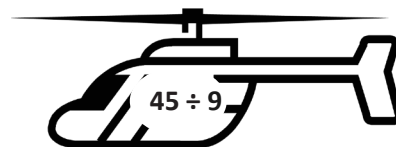
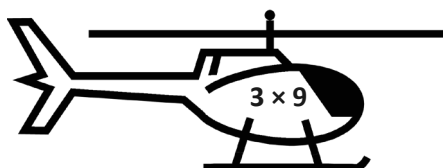
9 nines = 10 nines – 1 nine

= _____ – _____

= _____

3. Matt buys a pack of postage stamps. He counts 9 rows of 4 stamps. He thinks of 10 fours to find the total number of stamps. Show the strategy that Matt might have used to find the total number of stamps.

4. Match.



tape diagram

Name _____

Date _____

1. a. Skip-count by nine.

9 36 72

_____, _____, _____, _____, _____, _____, _____, _____, _____

- b. Look at the
- tens*
- place in the count-by. What is the pattern?

- c. Look at the
- ones*
- place in the count-by. What is the pattern?

2. Complete to make true statements.

- a. 10 more than 0 is
- 10
- ,

1 less is 9.

$1 \times 9 = \underline{9}$

- f. 10 more than 45 is _____,

1 less is _____.

$6 \times 9 = \underline{\hspace{2cm}}$

- b. 10 more than 9 is
- 19
- ,

1 less is 18.

$2 \times 9 = \underline{\hspace{2cm}}$

- g. 10 more than 54 is _____,

1 less is _____.

$7 \times 9 = \underline{\hspace{2cm}}$

- c. 10 more than 18 is _____,

1 less is _____.

$3 \times 9 = \underline{\hspace{2cm}}$

- h. 10 more than 63 is _____,

1 less is _____.

$8 \times 9 = \underline{\hspace{2cm}}$

- d. 10 more than 27 is _____,

1 less is _____.

$4 \times 9 = \underline{\hspace{2cm}}$

- i. 10 more than 72 is _____,

1 less is _____.

$9 \times 9 = \underline{\hspace{2cm}}$

- e. 10 more than 36 is _____,

1 less is _____.

$5 \times 9 = \underline{\hspace{2cm}}$

- j. 10 more than 81 is _____,

1 less is _____.

$10 \times 9 = \underline{\hspace{2cm}}$

3. a. Analyze the equations in Problem 2. What is the pattern?

b. Use the pattern to find the next 4 facts. Show your work.

$11 \times 9 =$

$12 \times 9 =$

$13 \times 9 =$

$14 \times 9 =$

c. Kent notices another pattern in Problem 2. His work is shown below. He sees the following:

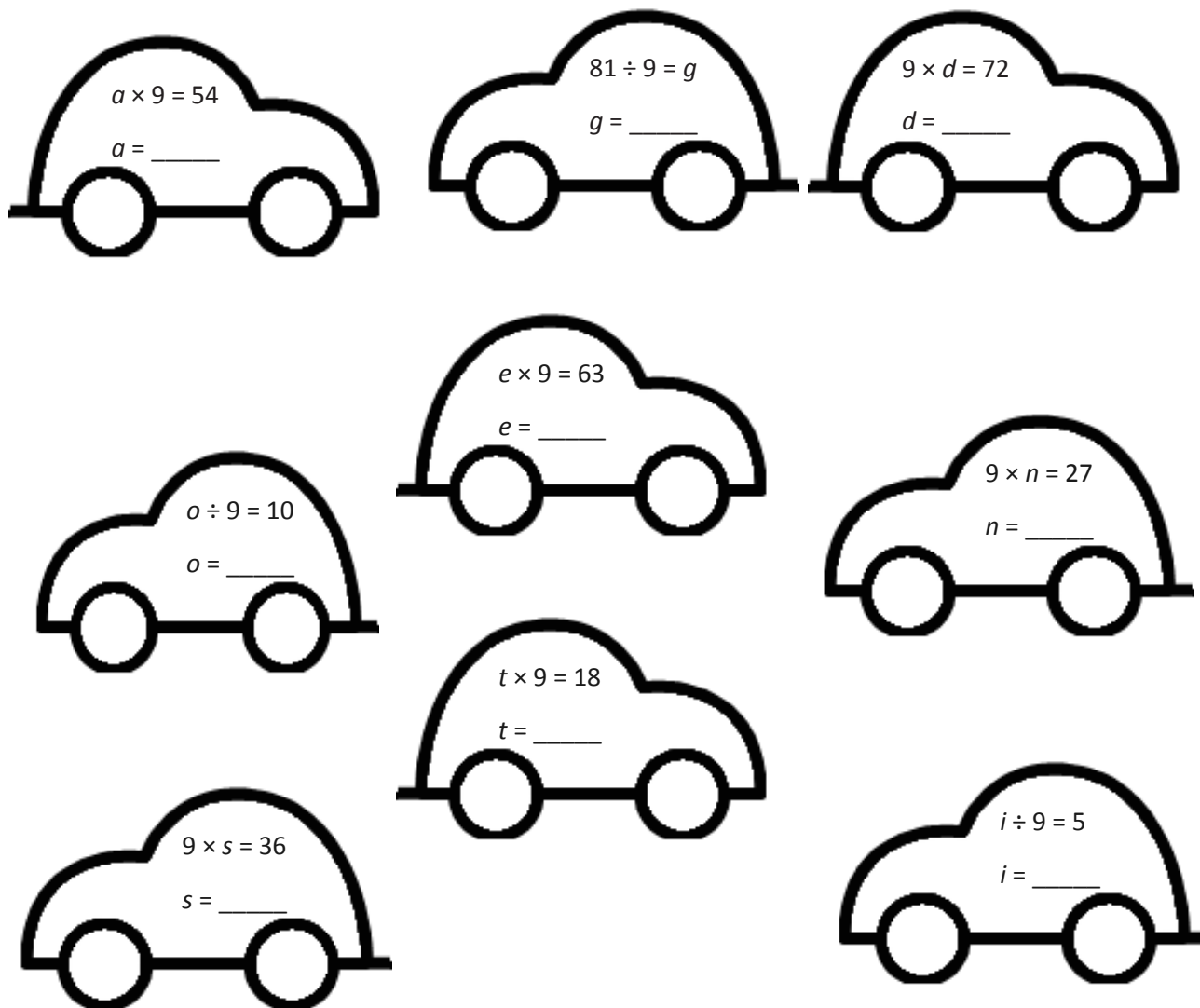
- The tens digit in the product is 1 less than the number of groups.
- The ones digit in the product is 10 minus the number of groups.

		Tens digit	Ones digit
$2 \times 9 = \underline{18}$	$\rightarrow$	$\underline{1} = 2 - 1$	$\underline{8} = 10 - 2$
$3 \times 9 = \underline{27}$	$\rightarrow$	$\underline{2} = 3 - 1$	$\underline{7} = 10 - 3$
$4 \times 9 = \underline{36}$	$\rightarrow$	$\underline{3} = 4 - 1$	$\underline{6} = 10 - 4$
$5 \times 9 = \underline{45}$	$\rightarrow$	$\underline{4} = 5 - 1$	$\underline{5} = 10 - 5$

Use Kent's strategy to solve 6×9 and 7×9 .

d. Show an example of when Kent's pattern doesn't work.

4. Each equation contains a letter representing the unknown. Find the value of each unknown. Then, write the letters that match the answers to solve the riddle.



How do you make one vanish?

$\frac{6}{6} \frac{8}{8} \frac{8}{8} \frac{6}{6} \frac{9}{9} \frac{6}{6} \frac{3}{3} \frac{8}{8} \frac{45}{45} \frac{2}{2} \frac{4}{4} \frac{9}{9} \frac{90}{90} \frac{3}{3} \frac{7}{7} !$

Name _____

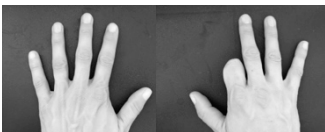
Date _____

1. a. Multiply. Then, add the tens digit and ones digit of each product.

$1 \times 9 = 9$	$\underline{0} + \underline{9} = \underline{9}$
$2 \times 9 = 18$	$\underline{1} + \underline{8} = \underline{\quad}$
$3 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$
$4 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$
$5 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$
$6 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$
$7 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$
$8 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$
$9 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$
$10 \times 9 =$	$\underline{\quad} + \underline{\quad} = \underline{\quad}$

- b. What is the sum of the digits in each product? How can this strategy help you check your work with the nines facts?
- c. Araceli continues to count by nines. She writes, “90, 99, 108, 117, 126, 135, 144, 153, 162, 171, 180, 189, 198. Wow! The sum of the digits is still 9.” Is she correct? Why or why not?

2. Araceli uses the number of groups in 8×9 to help her find the product. She uses $8 - 1 = 7$ to get the digit in the tens place and $10 - 8 = 2$ to get the digit in the ones place. Use her strategy to find 4 more facts.
3. Dennis calculates 9×8 by thinking about it as $80 - 8 = 72$. Explain Dennis' strategy.
4. Sonya figures out the answer to 7×9 by putting down her right index finger (shown). What is the answer? Explain how to use Sonya's finger strategy.



Name _____

Date _____

Write an equation, and use a letter to represent the unknown for Problems 1–6.

1. Mrs. Parson gave each of her grandchildren \$9. She gave a total of \$36. How many grandchildren does Mrs. Parson have?
2. Shiva pours 27 liters of water equally into 9 containers. How many liters of water are in each container?
3. Derek cuts 7 pieces of wire. Each piece is 9 meters long. What is the total length of the 7 pieces?

Name _____

Date _____

1. Complete.

a. $\underline{\hspace{1cm}} \times 1 = 6$

b. $\underline{\hspace{1cm}} \div 7 = 0$

c. $8 \times \underline{\hspace{1cm}} = 8$

d. $9 \div \underline{\hspace{1cm}} = 9$

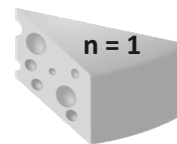
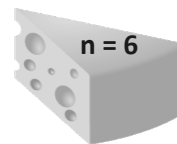
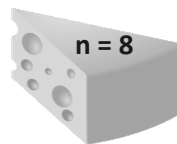
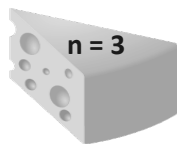
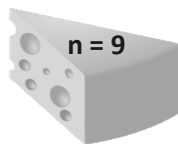
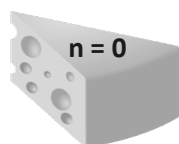
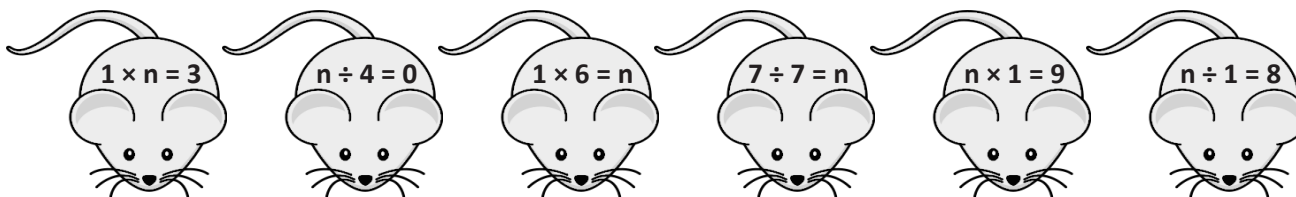
e. $0 \div 5 = \underline{\hspace{1cm}}$

f. $\underline{\hspace{1cm}} \times 0 = 0$

g. $4 \div \underline{\hspace{1cm}} = 1$

h. $\underline{\hspace{1cm}} \times 1 = 3$

2. Match each equation with its solution.

3. Let n be a number. Complete the blanks below with the products.

1	2	3	4	5	6	7	8	9	...	n
× 1	× 1	× 1	× 1	× 1	× 1	× 1	× 1	× 1		× 1
_____	_____	_____	_____	_____	_____	_____	_____	_____		_____

What pattern do you notice?

4. Josie says that any number divided by 1 equals that number.
- Write a division equation using n to represent Josie's statement.
 - Use your equation from Part (a). Let $n = 6$. Write a new equation, and draw a picture to show that your equation is true.
 - Write the related multiplication equation that you can use to check your division equation.
5. Matt explains what he learned about dividing with zero to his little sister.
- What might Matt tell his sister about solving $0 \div 9$? Explain your answer.
 - What might Matt tell his sister about solving $8 \div 0$? Explain your answer.
 - What might Matt tell his sister about solving $0 \div 0$? Explain your answer.

Name _____

Date _____

1. Write the products into the squares as fast as you can.

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

- a. Color all the squares with even products orange. Can an even product ever have an odd factor?
- b. Can an odd product ever have an even factor?
- c. Everyone knows that $7 \times 4 = (5 \times 4) + (2 \times 4)$. Explain how this is shown in the table.
- d. Use what you know to find the product of 7×16 or 8 sevens + 8 sevens.

2. In the table, only the products on the diagonal are shown.

a. Label each product on the diagonal.

1×1					
	2×2				
		3×3			
			4×4		
				5×5	
					6×6

- b. Draw an array to match each expression in the table below. Then, label the number of squares you added to make each new array. The first two arrays have been done for you.

1×1	2×2	3×3	4×4	5×5	6×6
					



 3









- c. What pattern do you notice in the number of squares that are added to each new array?
- d. Use the pattern you discovered in Part (b) to prove this: 9×9 is the sum of the first 9 odd numbers.

Name _____

Date _____

Use the RDW process for each problem. Explain why your answer is reasonable.

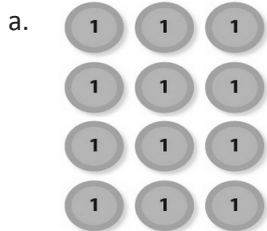
1. Rose has 6 pieces of yarn that are each 9 centimeters long. Sasha gives Rose a piece of yarn. Now, Rose has a total of 81 centimeters of yarn. What is the length of the yarn that Sasha gives Rose?
2. Julio spends 29 minutes doing his spelling homework. He then completes each math problem in 4 minutes. There are 7 math problems. How many minutes does Julio spend on his homework in all?

3. Pearl buys 125 stickers. She gives 53 stickers to her little sister. Pearl then puts 9 stickers on each page of her album. If she uses all of her remaining stickers, on how many pages does Pearl put stickers?
4. Tanner's beaker had 45 milliliters of water in it at first. After each of his friends poured in 8 milliliters, the beaker contained 93 milliliters. How many friends poured water into Tanner's beaker?
5. Cora weighs 4 new, identical pencils and a ruler. The total weight of these items is 55 grams. She weighs the ruler by itself and it weighs 19 grams. How much does each pencil weigh?

Name _____

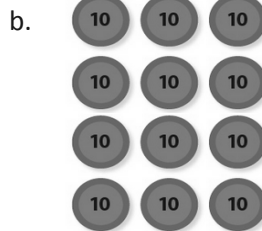
Date _____

1. Use the disks to fill in the blanks in the equations.



$$4 \times 3 \text{ ones} = \underline{\hspace{2cm}} \text{ ones}$$

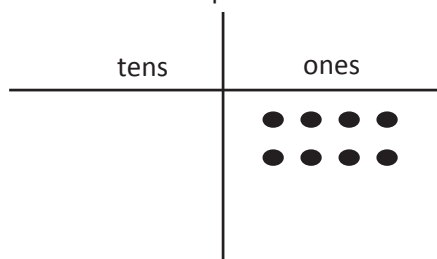
$$4 \times 3 = \underline{\hspace{2cm}}$$



$$4 \times 3 \text{ tens} = \underline{\hspace{2cm}} \text{ tens}$$

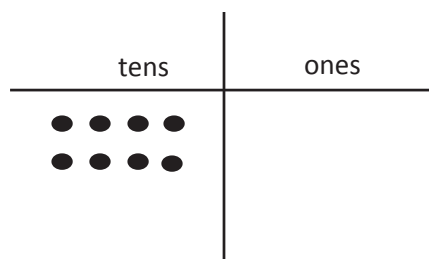
$$4 \times 30 = \underline{\hspace{2cm}}$$

2. Use the chart to complete the blanks in the equations.



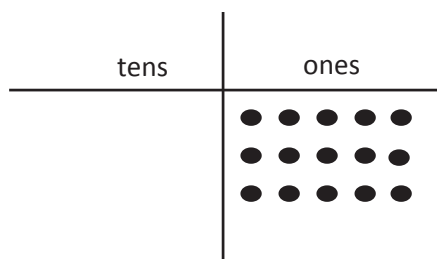
a. $2 \times 4 \text{ ones} = \underline{\hspace{2cm}} \text{ ones}$

$$2 \times 4 = \underline{\hspace{2cm}}$$



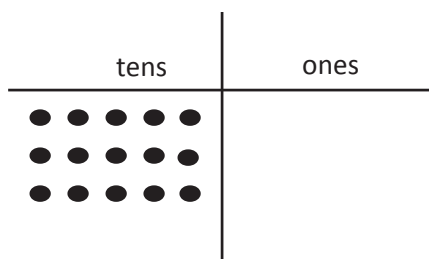
b. $2 \times 4 \text{ tens} = \underline{\hspace{2cm}} \text{ tens}$

$$2 \times 40 = \underline{\hspace{2cm}}$$



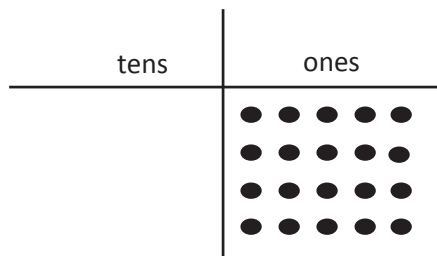
c. $3 \times 5 \text{ ones} = \underline{\hspace{2cm}} \text{ ones}$

$$3 \times 5 = \underline{\hspace{2cm}}$$



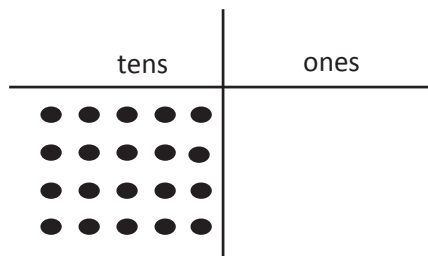
d. $3 \times 5 \text{ tens} = \underline{\hspace{2cm}} \text{ tens}$

$$3 \times 50 = \underline{\hspace{2cm}}$$



e. 4×5 ones = _____ ones

$4 \times 5 =$ _____



f. 4×5 tens = _____ tens

$4 \times 50 =$ _____

3. Fill in the blank to make the equation true.

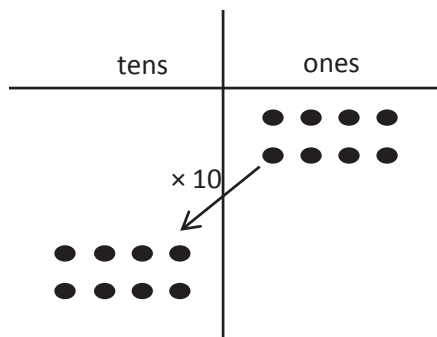
a. _____ = 7×2	b. _____ tens = $7 \text{ tens} \times 2$
c. _____ = 8×3	d. _____ tens = $8 \text{ tens} \times 3$
e. _____ = 60×5	f. _____ = 4×80
g. $7 \times 40 =$ _____	h. $50 \times 8 =$ _____

4. A bus can carry 40 passengers. How many passengers can 6 buses carry? Model with a tape diagram.

Name _____

Date _____

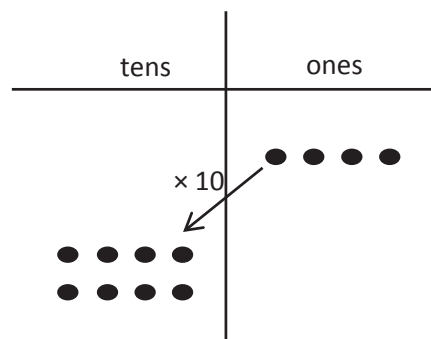
1. Use the chart to complete the equations. Then, solve. The first one has been done for you.



a. $(2 \times 4) \times 10$

$= (8 \text{ ones}) \times 10$

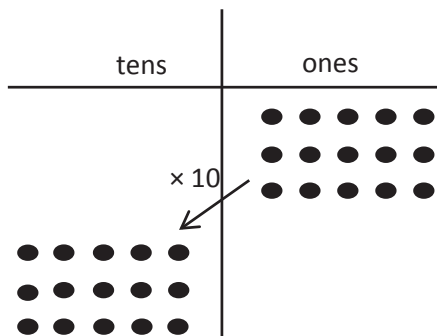
$= \underline{80}$



b. $2 \times (4 \times 10)$

$= 2 \times (4 \text{ tens})$

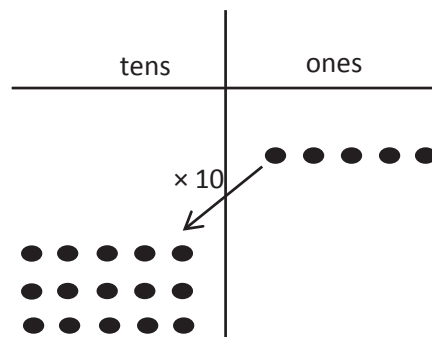
$= \underline{\hspace{2cm}}$



c. $(3 \times 5) \times 10$

$= (\underline{\hspace{1cm}} \text{ ones}) \times 10$

$= \underline{\hspace{2cm}}$

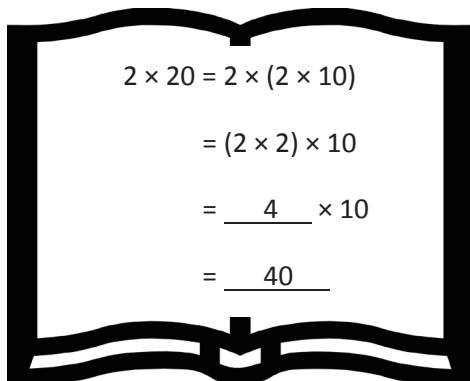


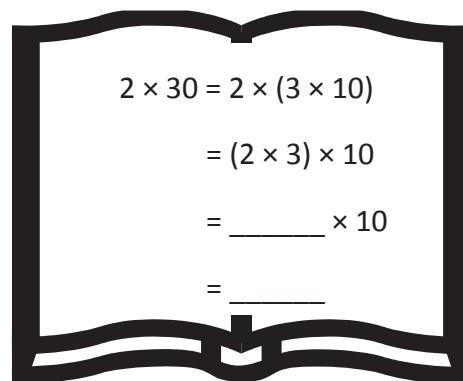
d. $3 \times (5 \times 10)$

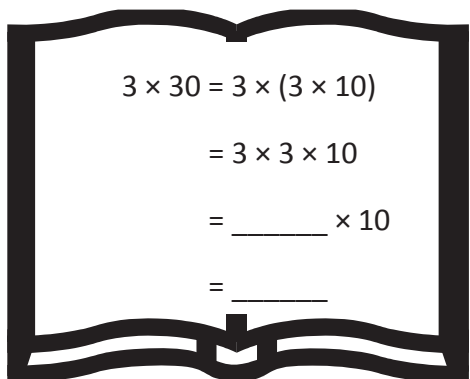
$= 3 \times (\underline{\hspace{1cm}} \text{ tens})$

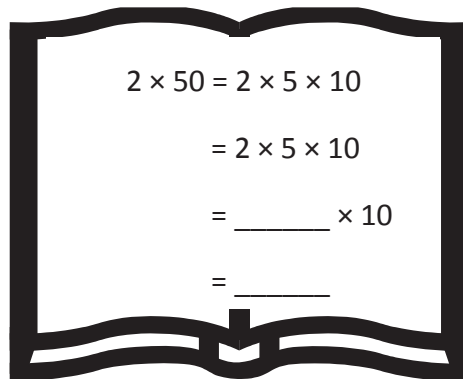
$= \underline{\hspace{2cm}}$

2. Place parentheses in the equations to find the related fact. Then, solve. The first one has been done for you.


$$\begin{aligned} 2 \times 20 &= 2 \times (2 \times 10) \\ &= (2 \times 2) \times 10 \\ &= \underline{4} \times 10 \\ &= \underline{40} \end{aligned}$$


$$\begin{aligned} 2 \times 30 &= 2 \times (3 \times 10) \\ &= (2 \times 3) \times 10 \\ &= \underline{\quad} \times 10 \\ &= \underline{\quad} \end{aligned}$$


$$\begin{aligned} 3 \times 30 &= 3 \times (3 \times 10) \\ &= 3 \times 3 \times 10 \\ &= \underline{\quad} \times 10 \\ &= \underline{\quad} \end{aligned}$$


$$\begin{aligned} 2 \times 50 &= 2 \times 5 \times 10 \\ &= 2 \times 5 \times 10 \\ &= \underline{\quad} \times 10 \\ &= \underline{\quad} \end{aligned}$$

3. Gabriella solves 20×4 by thinking about 10×8 . Explain her strategy.

Name _____

Date _____

Use the RDW process to solve each problem. Use a letter to represent the unknown.

1. There are 60 seconds in 1 minute. Use a tape diagram to find the total number of seconds in 5 minutes and 45 seconds.

2. Lupe saves \$30 each month for 4 months. Does she have enough money to buy the art supplies below? Explain why or why not.



3. Brad receives 5 cents for each can or bottle he recycles. How many cents does Brad earn if he recycles 48 cans and 32 bottles?

4. A box of 10 markers weighs 105 grams. If the empty box weighs 15 grams, how much does each marker weigh?
5. Mr. Perez buys 3 sets of cards. Each set comes with 18 striped cards and 12 polka dot cards. He uses 49 cards. How many cards does he have left?
6. Ezra earns \$9 an hour working at a book store. She works for 7 hours each day on Mondays and Wednesdays. How much does Ezra earn each week?



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