Name _____ Date _____

MULTIPLICATION AND DIVISION ACTIVITIES: Finding Factors

Directions: Find multiplication equations for the assigned number. For each equation, (1) use the appropriate number of counters and separate them into equal subsets, and (2) use the counters to build a rectangle that has the given number of squares.

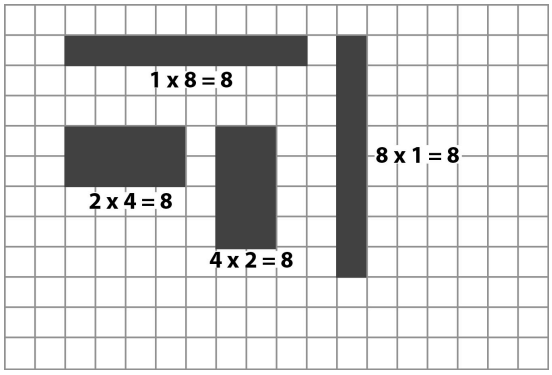
1.	12	1 x 12	12 x 1	2 x 6
		3 x 4	4 x 3	6 x 2
2.	18	_____	_____	_____
		_____	_____	_____
3.	24	_____	_____	_____
		_____	_____	_____
4.	30	_____	_____	_____
		_____	_____	_____
5.	36	_____	_____	_____
		_____	_____	_____
6.	40	_____	_____	_____
		_____	_____	_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 63)

MULTIPLICATION AND DIVISION ACTIVITIES: Factor Patterns

Directions: You are going to look for multiplication equations and the corresponding rectangular array for several numbers (e.g., 1 through 16 or 10 through 25). Try to find *all* the multiplication equations and rectangular arrays for each number. Record your rectangles on grid paper, and label each rectangle with its multiplication equation. (See below for how this is done with 8.)

Group together all arrays with the same number of squares.



After identifying the multiplication equations and the rectangular arrays, look for patterns in the factors and rectangular arrays. For example:

1. Which numbers have the least number of arrays and, therefore, the least number of factors?

_____

2. Which numbers have a factor of 2?

_____

3. Which numbers have arrays that form a square?

_____

4. What can you say about the factors for even numbers?

_____

5. Do even numbers always have 2 even factors?

_____

6. Do odd numbers always have 2 even factors?

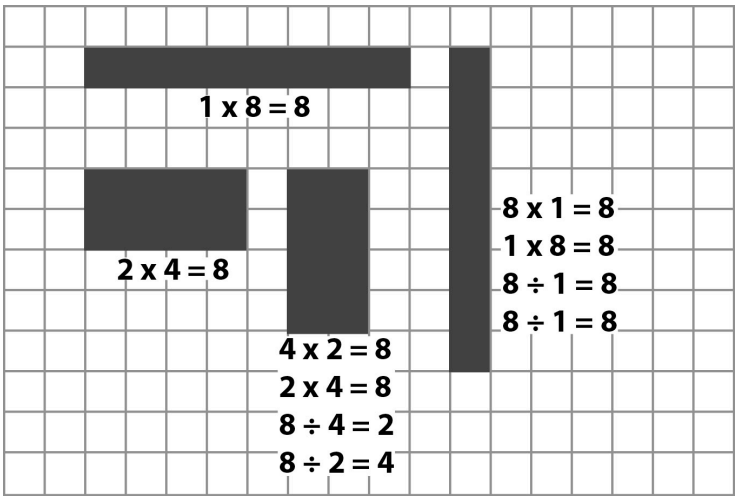
_____

7. Why do you think different patterns occur?

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 63)

Extension: For each different equation that you have written as part of your answer, complete its fact family by recording its three matching equations. (See below for how this is done with 8.)



MULTIPLICATION AND DIVISION ACTIVITIES: Learning About Division

Directions: For the assigned number, count out that many counters. Then, separate the counters accordingly. For each "separation," write the corresponding multiplication and division equation for what your materials show.

1. 36
1a. Separate your counters into six equal-sized sets.

6 x 6 = 36 36 ÷ 6 = 6

1b. Make as many sets of nine as possible.

4 x 9 = 36 36 ÷ 9 = 4

2. 28
2a. Separate your counters into seven equal-sized sets.

_____ _____

2b. Make as many sets of fourteen as possible.

_____ _____

3. 10
3a. Separate your counters into three equal-sized sets.

_____ _____

3b. Make as many sets of five as possible.

_____ _____

4. 37
4a. Separate your counters into ten equal-sized sets.

_____ _____

4b. Make as many sets of eight as possible.

_____ _____

5. 6
5a. Separate your counters into three equal-sized sets.

_____ _____

5b. Make as many sets of six as possible.

_____ _____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 64)

Extension: Follow the same directions. For each number, create a word problem that matches one of the four equations. Be ready to explain how your word problems fit with what you did with the counters.

6. 45
6a. Separate your counters into nine equal-sized sets.

_____ _____

6b. Make as many sets of five as possible.

_____ _____

6c. Word Problem: _____

_____

_____

7. 55
7a. Separate your counters into nine equal-sized sets.

_____ _____

7b. Make as many sets of eight as possible.

_____ _____

7c. Word Problem: _____

_____

_____

8. 15
8a. Separate your counters into four equal-sized sets.

_____ _____

8b. Make as many sets of eight as possible.

_____ _____

8c. Word Problem: _____

_____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 64)

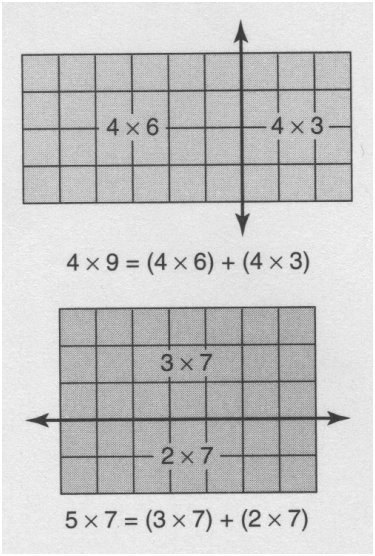
Name _____ Date _____

USEFUL MULTIPLICATION AND DIVISION PROPERTIES: Slice It Up

Directions: In pairs, you will be given several sheets of graph paper. For each multiplication problem, find all of the different ways to make a single slice through the rectangle. (You will have to draw multiple rectangles for each problem.)

For each slice, write an equation below the array. The individual expressions can be written in the arrays.

For each multiplication problem, record all of its equations on the lines below. Be ready to discuss the different equations. (How many are there? What are they?)



1. 4 x 9 _____

_____

_____

_____

2. 5 x 7 _____

_____

_____

_____

3. 6 x 10 _____

_____

_____

_____

4. 8 x 8 _____

_____

_____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 66)

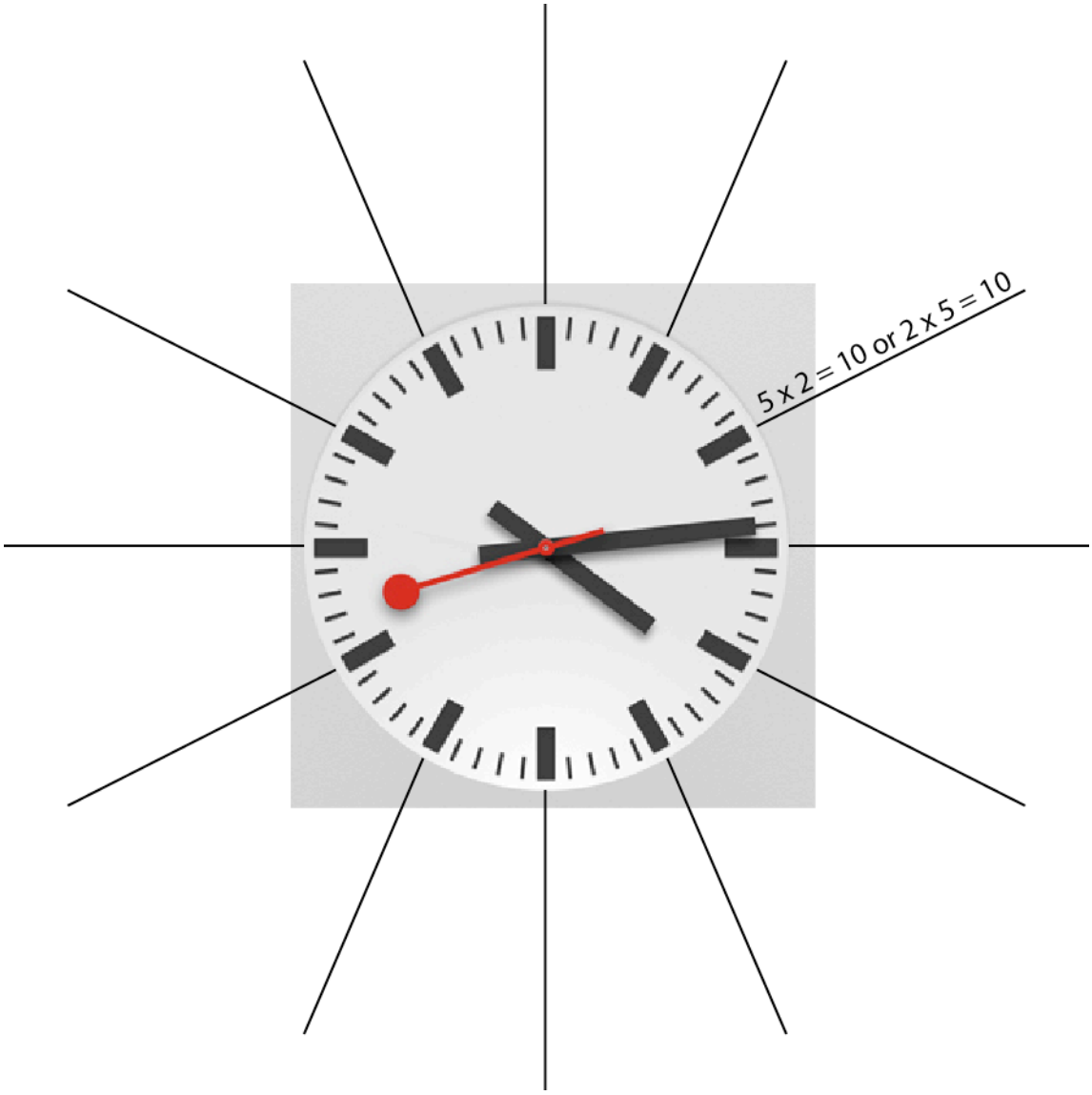
Name _____ 32 Date _____

FIVES FACTS: Clock Facts

Focus on the minute hand of the clock. When it points to a number, how many minutes after the hour is it?

On a clock, the teacher will point to numbers 1 to 12 in random order. Respond with the minutes after.

Directions: On the line coming out of each multiple of 5, write its respective fact.



1. Do you think that thinking about a clock will help you to remember your facts of 5? Why or why not?

_____

_____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (pp. 88-89)

NIFTY NINES: Patterns in the Nines Facts

9 x 1 = 9
9 x 2 = 18
9 x 3 = 27
9 x 4 = 36
9 x 5 = 45
9 x 6 = 54
9 x 7 = 63
9 x 8 = 72
9 x 9 = 81
9 x 10 = 90
9 x 11 = 99
9 x 12 = 108

1. Find as many patterns as possible in the table.

_____

_____

_____

_____

_____

_____

2. After discussing all the patterns, use the patterns to think of a clever way to figure out a nine fact if you didn't know it. (Even for students who know their nine facts, this remains a valid task.)

_____

_____

_____

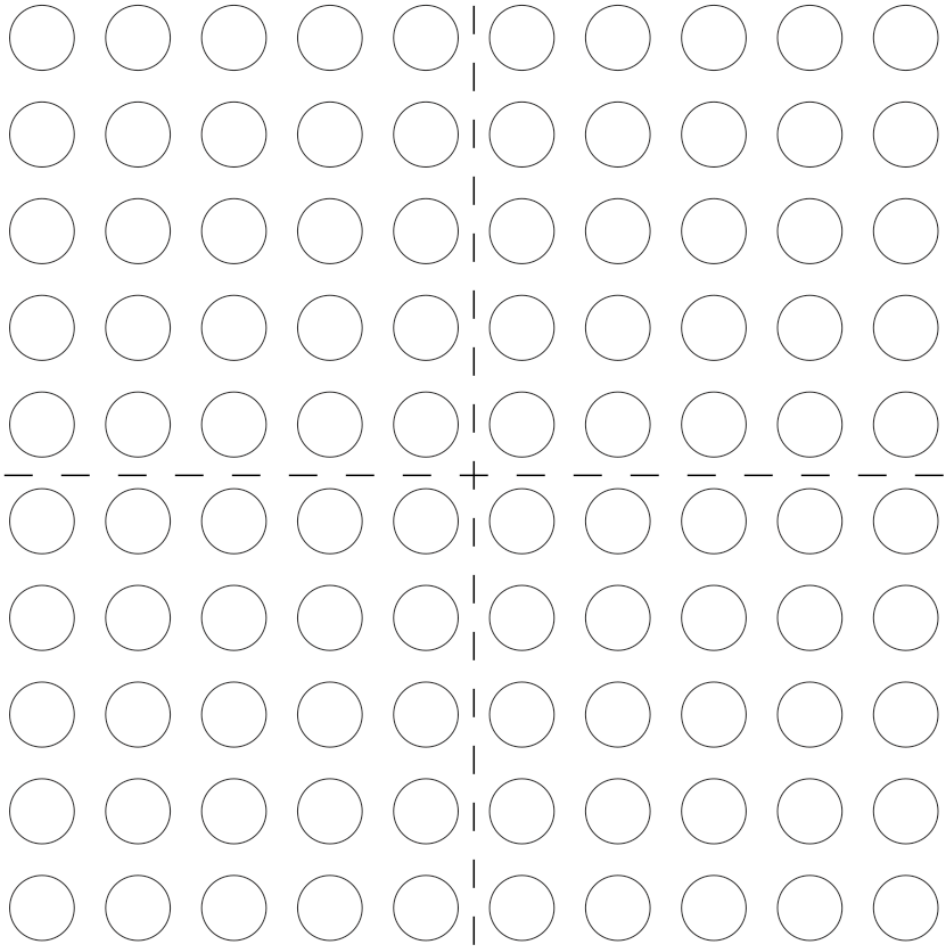
_____

_____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 90)

HELPING FACTS: If You Didn't Know



1. Pretend that you do not know 6 x 5 but you do know 5 x 5. How could you use 5 x 5 to help you to determine 6 x 5? Use the ten-by-ten dot array for help.

_____

_____

_____

_____

2. Without using the dot array, suppose you know 3 x 5 but not 6 x 5. How could you use 3 x 5 to determine 6 x 5?

_____

_____

_____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 92)

Directions: If you don't know the answer to 6 x 8 (or any other fact about which you need to think), how could you figure it out by using something that you do know? Your method should be something that you can do in your head and should not rely on counting. Try to come up with more than one way. The array can help you to think about different strategies, but you do not have to use it.

After, share your work with a partner and then the class.

3. Troubling fact: _____ Strategy: _____

_____

_____

_____

4. Troubling fact: _____ Strategy: _____

_____

_____

_____

5. Troubling fact: _____ Strategy: _____

_____

_____

_____

6. Troubling fact: _____ Strategy: _____

_____

_____

_____

7. Troubling fact: _____ Strategy: _____

_____

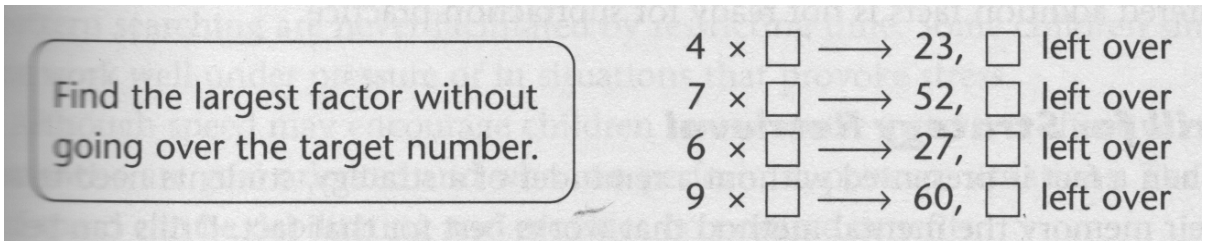
_____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 92)

Name _____ Date _____

DIVISION FACTS AND "NEAR FACTS": How Close Can You Get?



Directions: Find the one-digit factor that makes the product as close as possible to the target without going over. Then, fill in the remainder.

1. 5 x _____ = 27 _____ left over

2. 9 x _____ = 40 _____ left over

3. 7 x _____ = 41 _____ left over

4. 4 x _____ = 39 _____ left over

5. 9 x _____ = 87 _____ left over

6. _____ x 1 = 11 _____ left over

7. _____ x 2 = 13 _____ left over

8. _____ x 8 = 51 _____ left over

9. _____ x 10 = 93 _____ left over

10. _____ x 6 = 52 _____ left over

11. Explain the strategies that you used in order to get the majority of your answers (for both blanks).

_____

_____

_____

_____

_____

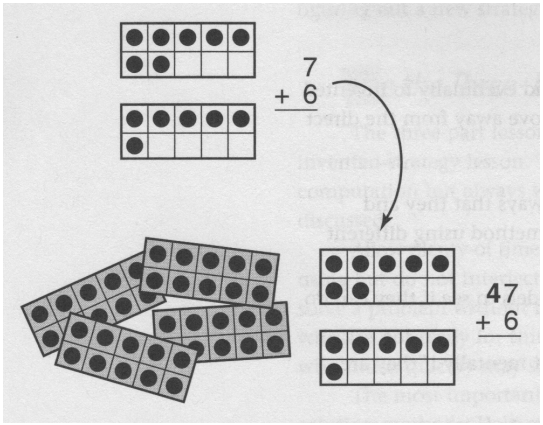
_____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 93)

ADDING AND SUBTRACTING SINGLE DIGITS: Ten-Frame Adding and Subtracting

Review the make-ten idea from addition facts using two ten-frames. (Add on to get up to ten and then add the rest.)



Use the same idea to add on to a two-digit number. Two students can work together.

Directions: First, make a two-digit number with the little ten-frame cards. Then, stack up all of the less-than-ten cards and turn one over. Together, talk about how to get the total quickly.

The same approach is used for subtraction. For instance, for 53 – 7, take off 3 to get to 50, then 4 more is 46.

1. 46 + 7 = 53

Strategy: I did 46 + 4 = 50. Then, I added on the remaining 3 to get a total of 53.

2. _____ + _____ = _____

Strategy: _____

_____

3. _____ + _____ = _____

Strategy: _____

_____

4. _____ + _____ = _____

Strategy: _____

_____

5. _____ + _____ = _____

Strategy: _____

_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 108)

6. _____ + _____ = _____

Strategy: _____

_____

7. _____ + _____ = _____

Strategy: _____

_____

8. _____ – _____ = _____

Strategy: _____

_____

9. _____ – _____ = _____

Strategy: _____

_____

10. _____ – _____ = _____

Strategy: _____

_____

11. _____ – _____ = _____

Strategy: _____

_____

12. _____ – _____ = _____

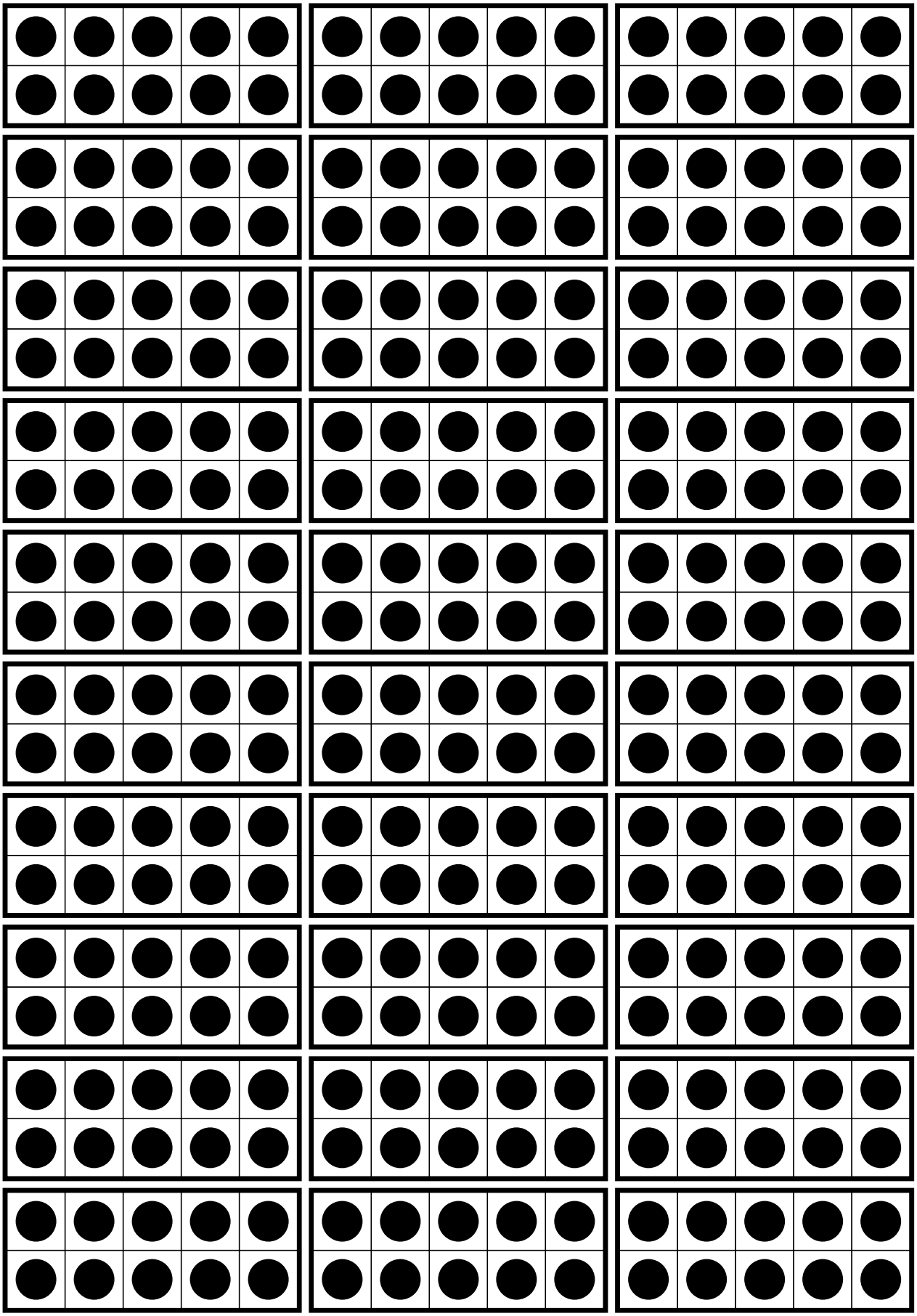
Strategy: _____

_____

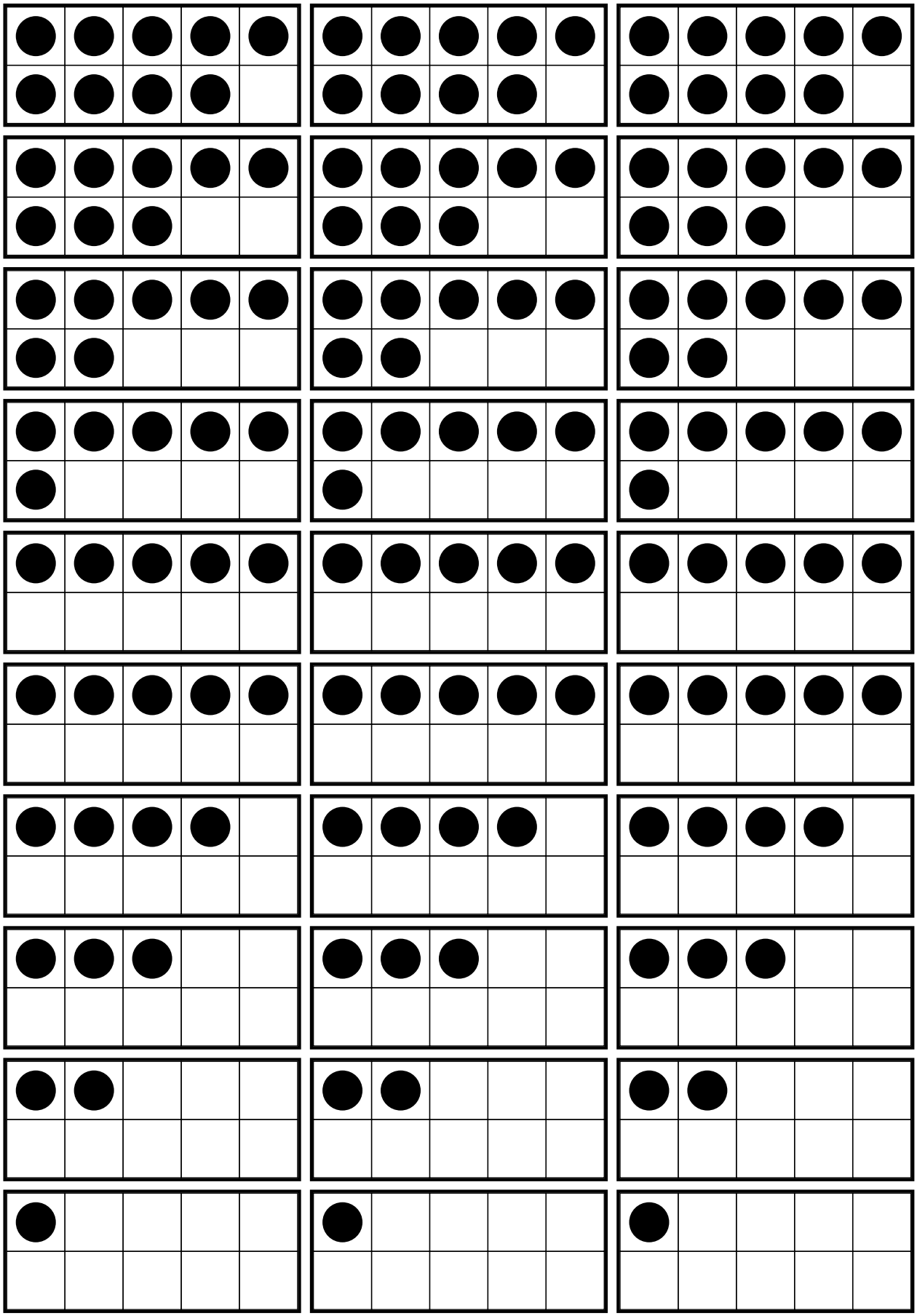
13. _____ – _____ = _____

Strategy: _____

_____



BLM 3—Little ten-frames



BLM 4—Little ten-frames

Name _____ Date _____

TWO-DIGIT MULTIPLIERS: Cluster Problems

Directions: Use facts and combinations that you know or can easily figure out in order to find the answers to more complex computations.

The goal is to figure out the last product. Explain what problems were most helpful in solving the last problem. If you wish to add other problems to the cluster to help in finding your solution, you are encouraged to do so.

1. 3 x 7 = _____ Which problems helped the most? Why? _____

5 x 7 = _____ _____

10 x 7 = _____ _____

50 x 7 = _____ _____

53 x 7 = _____ _____

2. 2 x 50 = _____ Which problems helped the most? Why? _____

10 x 50 = _____ _____

34 x 25 = _____ _____

30 x 50 = _____ _____

34 x 50 = _____ _____

3. 4 x 6 = _____ Which problems helped the most? Why? _____

4 x 10 = _____ _____

4 x 20 = _____ _____

4 x 26 = _____ _____

4. 2 x 5 = _____ Which problems helped the most? Why? _____

2 x 30 = _____ _____

3 x 30 = _____ _____

2 x 100 = _____ _____

2 x 95 = _____ _____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (pp. 117-118)

5. 2 x 8 = _____ Which problems helped the most? Why? _____

22 x 8 = _____ _____

10 x 8 = _____ _____

30 x 8 = _____ _____

32 x 8 = _____ _____

6. 5 x 7 = _____ Which problems helped the most? Why? _____

10 x 7 = _____ _____

4 x 25 = _____ _____

20 x 7 = _____ _____

25 x 7 = _____ _____

Directions: Fill in the blanks with clusters for the given product.

7. _____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

33 x 8 = 264

8. _____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

9 x 72 = 648

9. _____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

46 x 80 = 3,680

10. _____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

_____ x _____ =_____

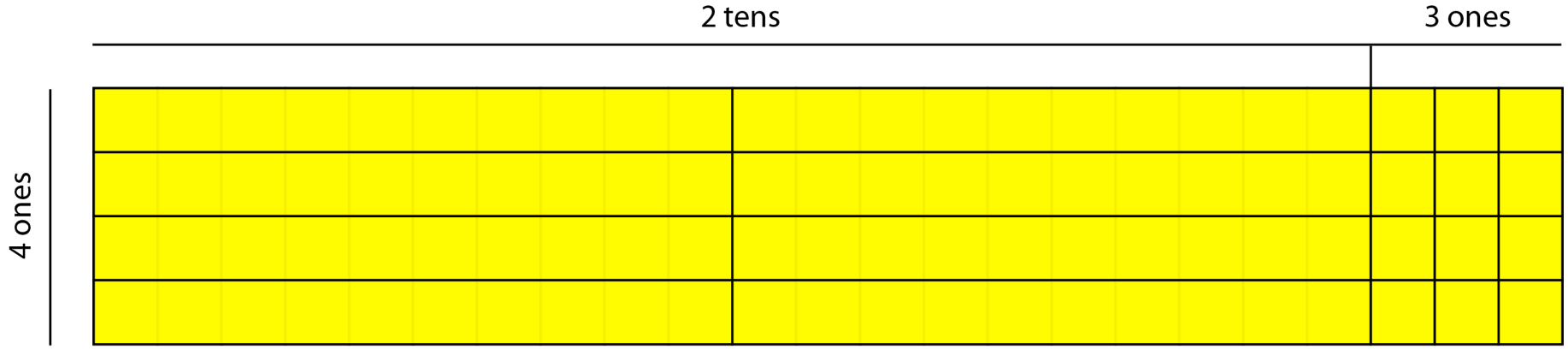
5 x 38 = 190

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (pp. 117-118)

Name _____ Date _____

ONE-DIGIT MULTIPLIERS: Area Model for Multiplication

Directions: Use base-ten models to decide how many tens pieces and how many ones will fit in each rectangle. Then, record the partial products and add them up to find the answer to the multiplication problem.

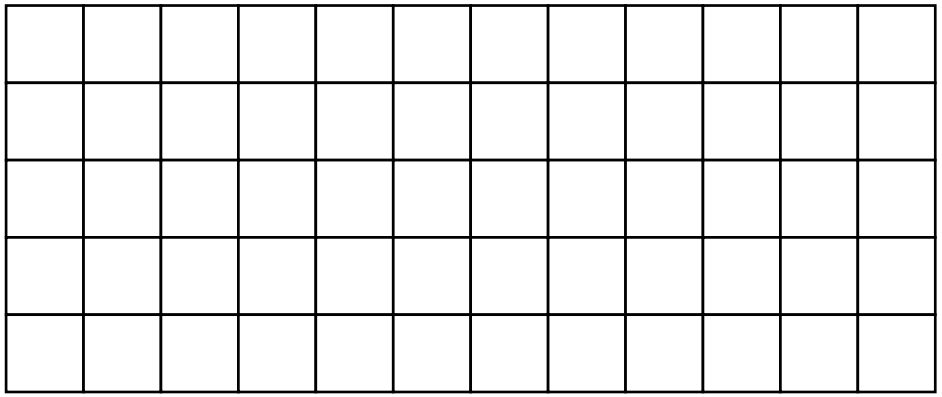


4 ones x 2 tens = **80**

4 ones x 3 ones = **12** ones

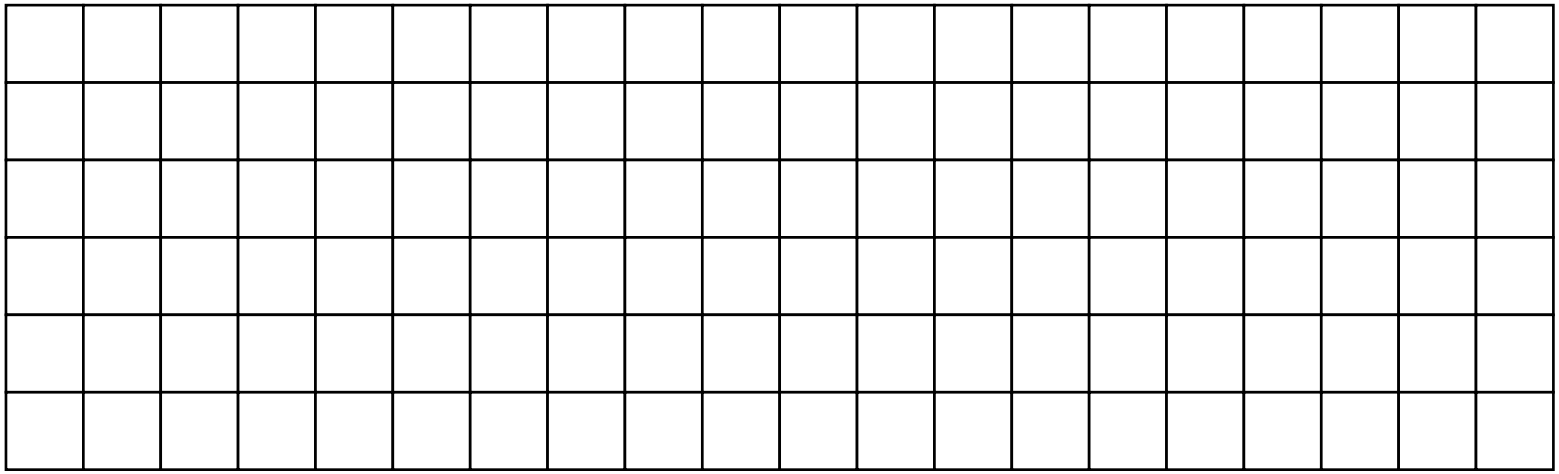
23 x 4 = **102**

1.

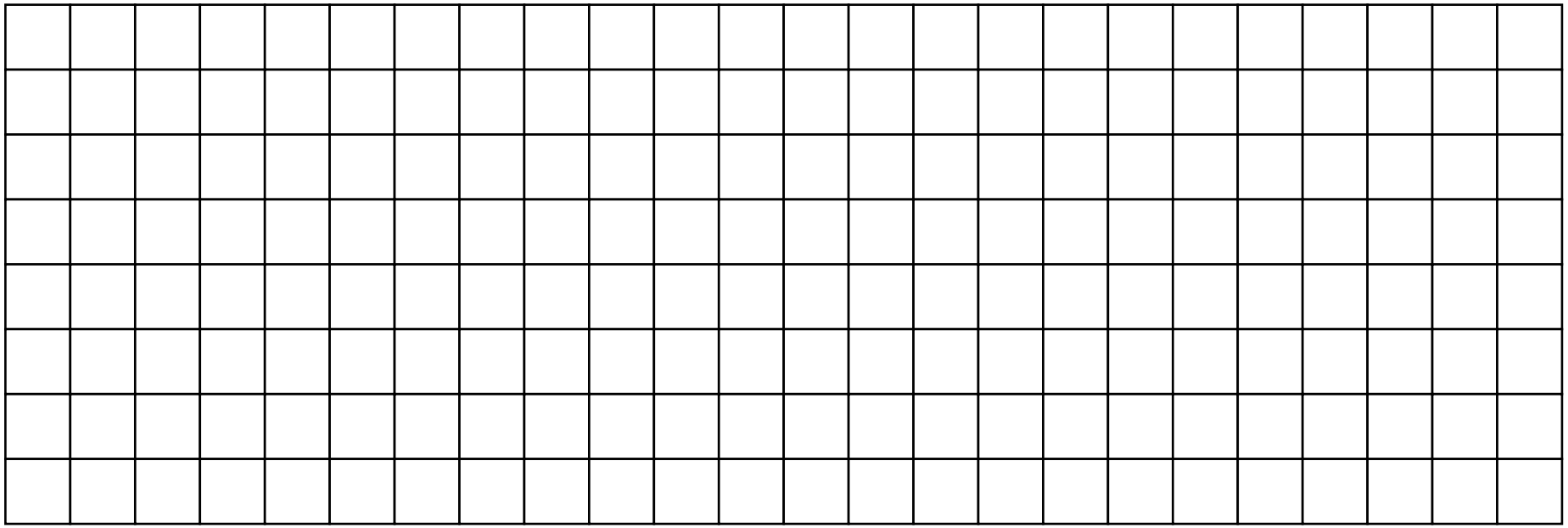


Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 119)

2.

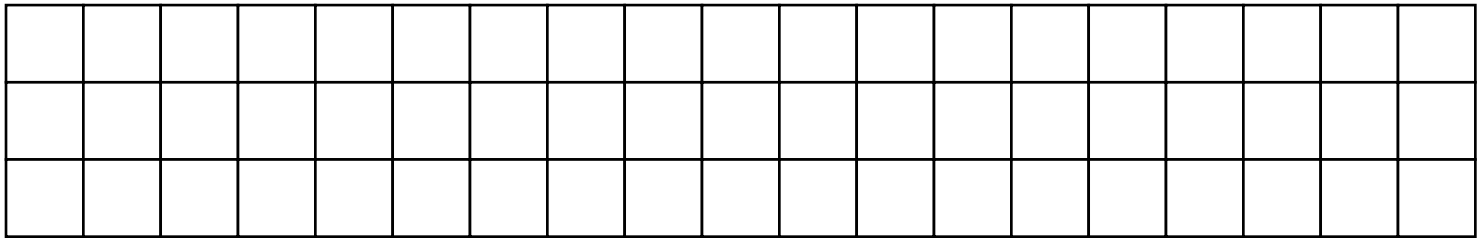


3.

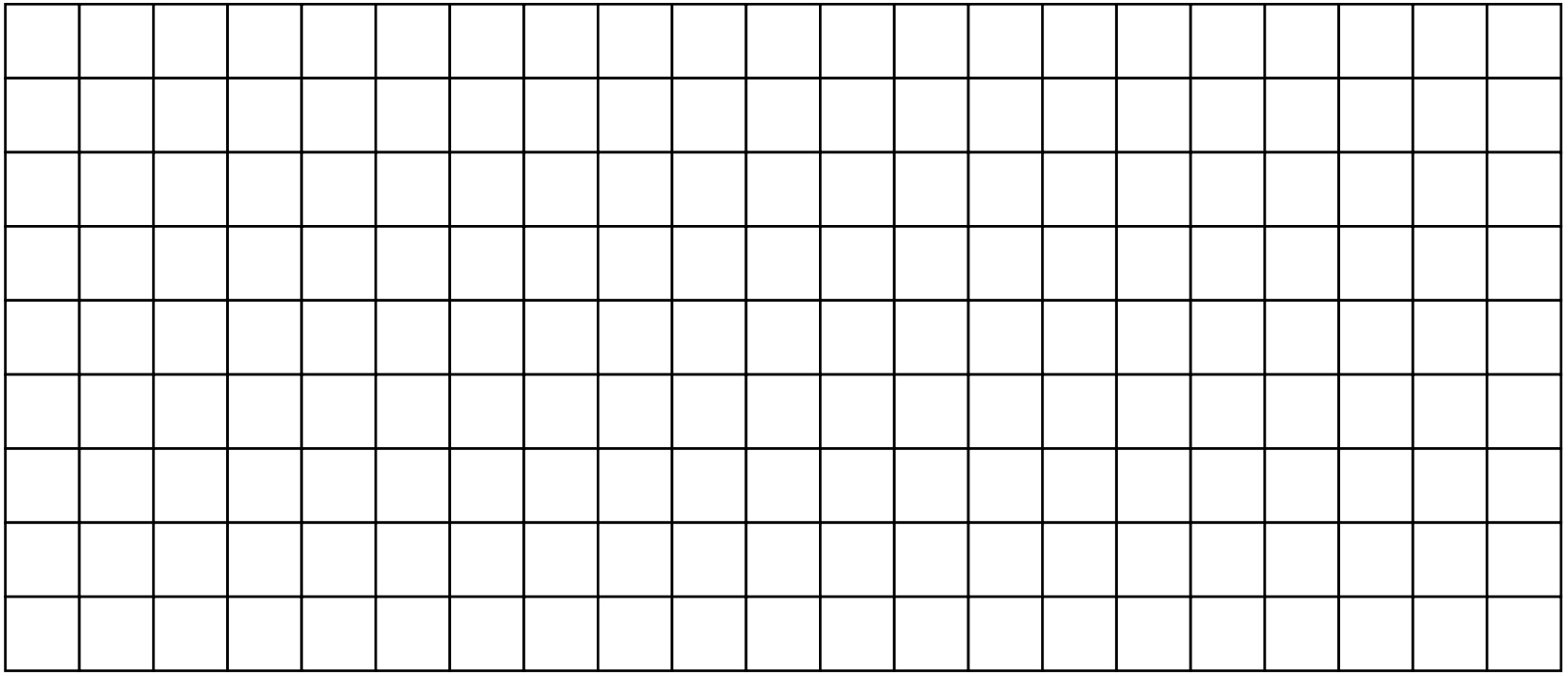


Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 119)

4.



5.



Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 119)

6. What is the relationship between each rectangle's multiplication problem vs. the number of units that will fit inside the rectangle (its area)?

_____

_____

Directions: Use partial products for mental multiplication.

7.	5 x 12	5 x 10 = 50	5 x 2 = 10	50 + 10 = **60**
8.	4 x 23	_____	_____	_____
9.	6 x 32	_____	_____	_____
10.	8 x 24	_____	_____	_____
11.	3 x 19	_____	_____	_____
12.	9 x 33	_____	_____	_____
13.	7 x 44	_____	_____	_____
14.	9 x 31	_____	_____	_____
15.	6 x 47	_____	_____	_____

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (p. 119)

SHARING TASKS: Word Problems

Directions: Solve, circle your answer. You may use manipulatives for help. Show your work in the space provided.

1. Four children are sharing 10 brownies so that each one will get the same amount. How much can each child have?

2. Two children are sharing 5 brownies so that each one will get the same amount. How much can each child have?

3. Four children are sharing 2 brownies so that each one will get the same amount. How much can each child have?

4. Four children are sharing 5 brownies so that each one will get the same amount. How much can each child have?

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (pp. 132-133)

5. Eight children are sharing 4 brownies so that each one will get the same amount. How much can each child have?

6. Four children are sharing 3 brownies so that each one will get the same amount. How much can each child have?

7. Six children are sharing 4 pizzas so that each one will get the same amount. How much can each child have?

8. Six children are sharing 7 pizzas so that each one will get the same amount. How much can each child have?

9. Three children are sharing 5 pizzas so that each one will get the same amount. How much can each child have?

Adapted from *Teaching Student-Centered Mathematics: Grades 3-5* (pp. 132-133)