EUREKA MATH

A STORY OF UNITS

Mathematics Curriculum

Grade 2 • MODULE 6

Foundations of Multiplication and Division

PROBLEM SETS

Info for parents: http://bit.ly/pusdmath

Video tutorials: http://embarc.online

Version 3

Table of Contents

GRADE 2 • MODULE 6

Foundations of Multiplication and Division

Name _____ Date _____

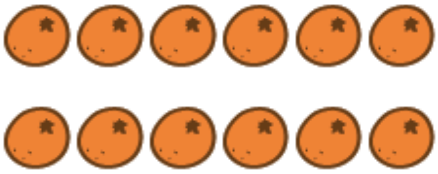
1. Circle groups of two apples.

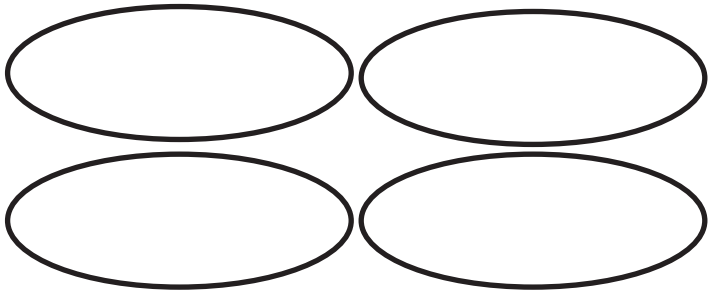
There are _____ groups of two apples.

2. Circle groups of three balls.

There are _____ groups of three balls.

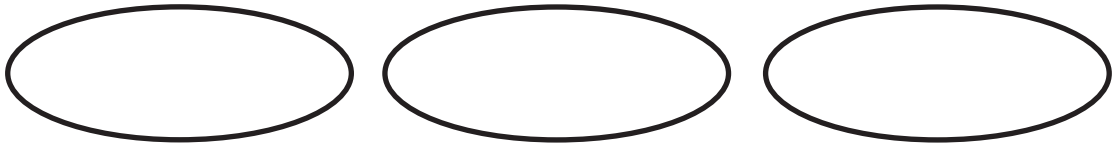
3. Redraw the 12 oranges into 4 equal groups.





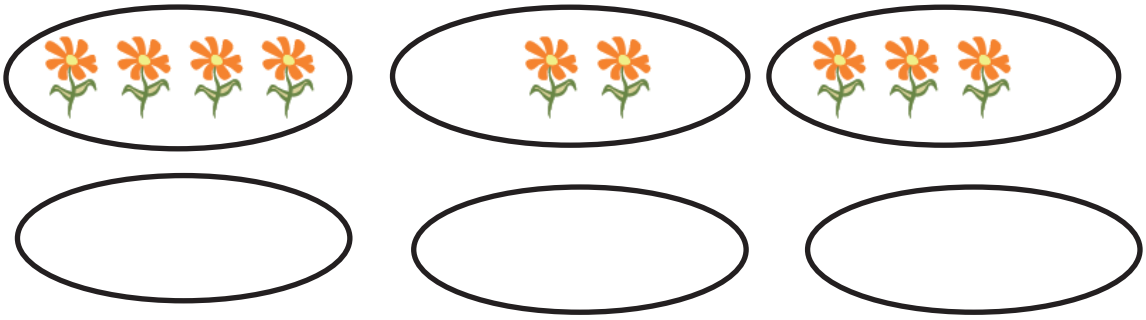
4 groups of _____ oranges

4. Redraw the 12 oranges into 3 equal groups.



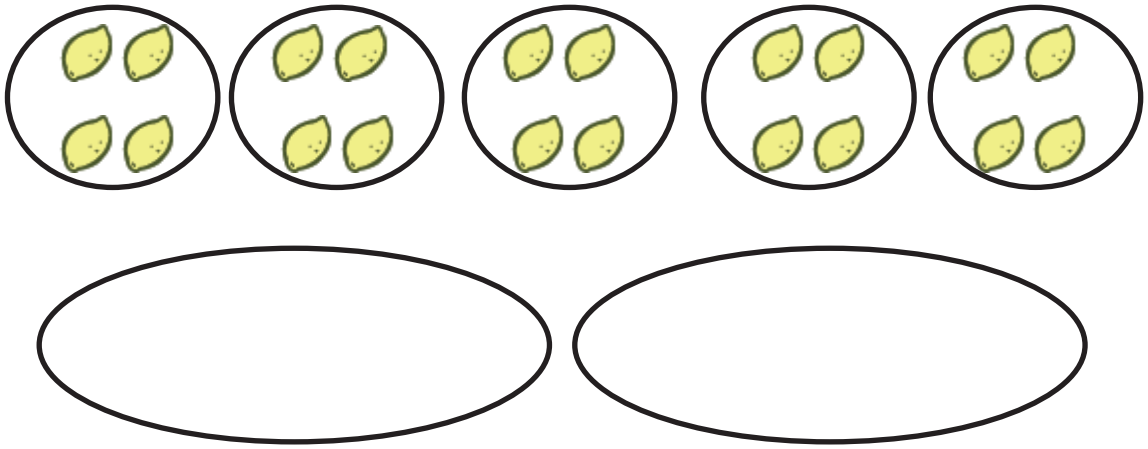
3 groups of _____ oranges

5. Redraw the flowers to make each of the 3 groups have an equal number.



3 groups of _____ flowers = _____ flowers.

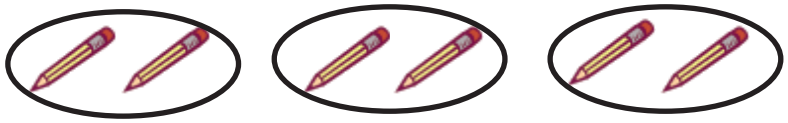
6. Redraw the lemons to make 2 equal size groups.



2 groups of _____ lemons = _____ lemons.

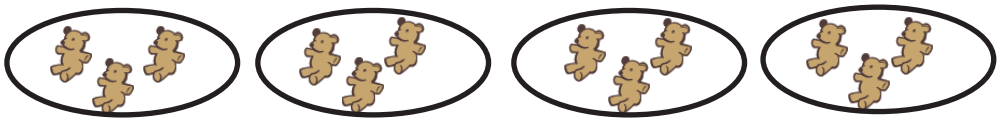
Name _____ Date _____

1. Write a repeated addition equation to show the number of objects in each group. Then, find the total.

a. 

_____ + _____ + _____ = _____

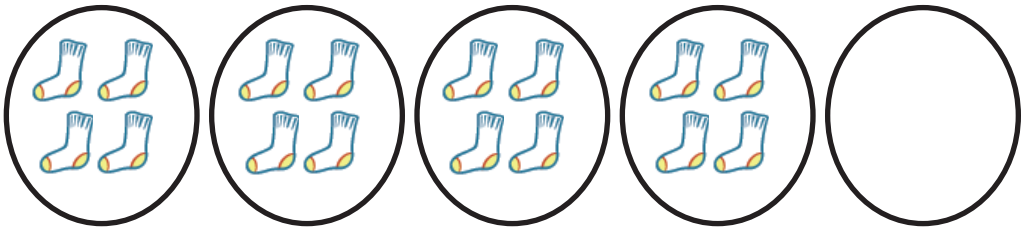
3 groups of _____ = _____

b. 

_____ + _____ + _____ + _____ = _____

4 groups of _____ = _____

2. Draw 1 more group of four. Then, write a repeated addition equation to match.



_____ + _____ + _____ + _____ + _____ = _____

5 groups of _____ = _____

3. Draw 1 more group of three. Then, write a repeated addition equation to match.

_____ + _____ + _____ + _____ = _____

_____ groups of 3 = _____

4. Draw 2 more equal groups. Then, write a repeated addition equation to match.

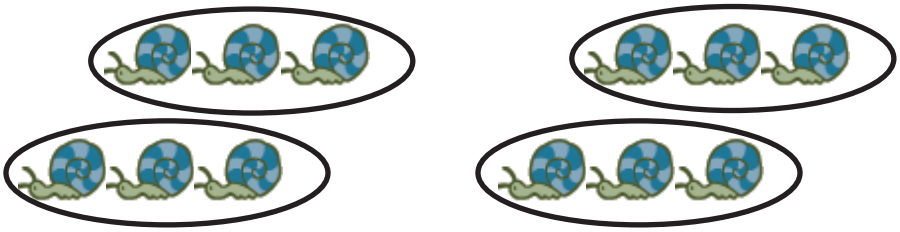
_____ + _____ + _____ + _____ + _____ = _____

_____ groups of 2 = _____

5. Draw 3 groups of 5 stars. Then, write a repeated addition equation to match.

Name _____ Date _____

1. Write a repeated addition equation to match the picture. Then, group the addends into pairs to show a more efficient way to add.

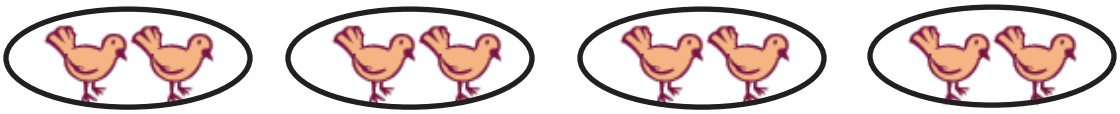
a. 

_____ + _____ + _____ + _____ = _____

\ / \ /

_____ + _____ = _____

4 groups of _____ = 2 groups of _____

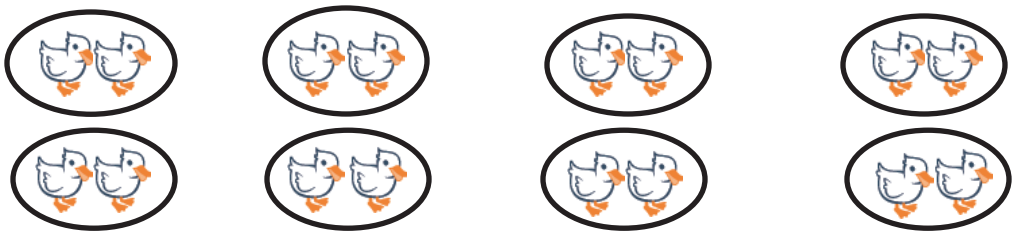
b. 

_____ + _____ + _____ + _____ = _____

_____ + _____ = _____

4 groups of _____ = 2 groups of _____

c.



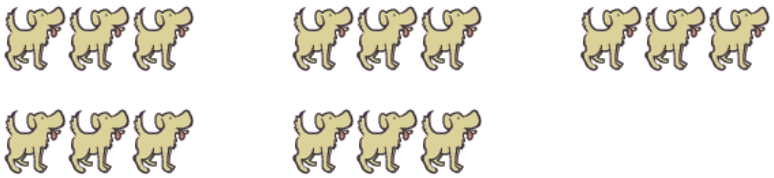
_____ + _____ + _____ + _____ + _____ + _____ + _____ + _____ = _____

_____ + _____ + _____ + _____ = _____

8 groups of _____ = 4 groups of _____

2. Write a repeated addition equation to match the picture. Then, group addends into pairs, and add to find the total.

a.



_____ + _____ + _____ + _____ + _____ = _____

_____ + _____ + 3 = _____

_____ + 3 = _____

b.

_____ + _____ + _____ = _____

_____ + 3 = _____

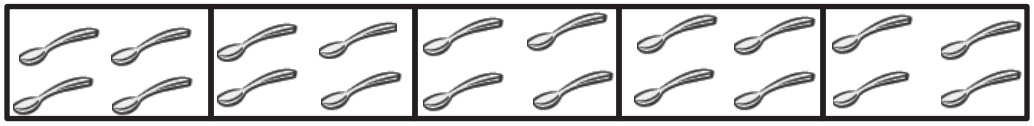
Name _____ Date _____

1. Write a repeated addition equation to find the total of each tape diagram.

a. 

_____ + _____ + _____ + _____ = _____

4 groups of 2 = _____

b. 

_____ + _____ + _____ + _____ + _____ = _____

5 groups of _____ = _____

c.

5	5	5

_____ + _____ + _____ = _____

3 groups of _____ = _____

d.

3	3	3	3	3	3

_____ + _____ + _____ + _____ + _____ + _____ = _____

_____ groups of _____ = _____

2. Draw a tape diagram to find the total.

a. 3 + 3 + 3 + 3 = _____

b. 4 + 4 + 4 = _____

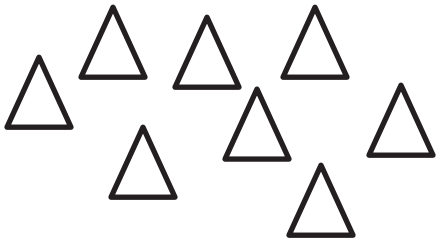
c. 5 groups of 2

d. 4 groups of 4

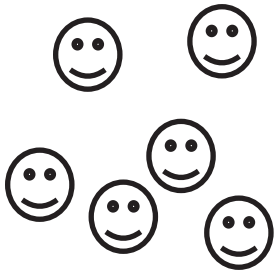
e. 

Name _____ Date _____

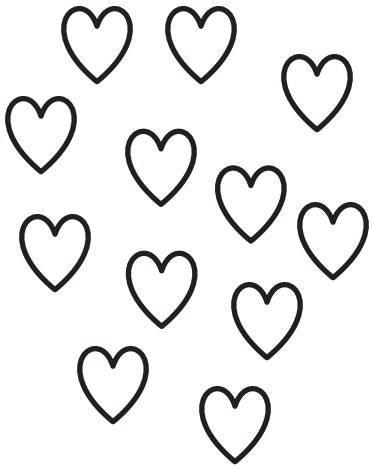
1. Circle groups of four. Then, draw the triangles into 2 equal rows.



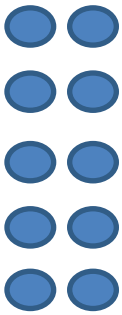
2. Circle groups of two. Redraw the groups of two as rows and then as columns.



3. Circle groups of three. Redraw the groups of three as rows and then as columns.



4. Count the objects in the arrays from left to right by rows and by columns. As you count, circle the rows and then the columns.

a. 

b. 

5. Redraw the circles and stars in Problem 4 as columns of two.

6. Draw an array with 15 triangles.

7. Show a different array with 15 triangles.

Name _____ Date _____

1. Complete each missing part describing each array.

Circle rows.

a. 

5 rows of _____ = _____

___ + ___ + ___ + ___ + ___ = _____

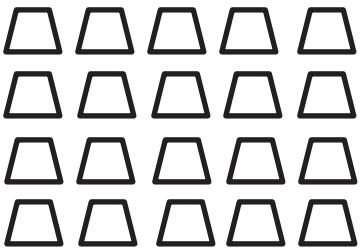
Circle columns.

b. 

3 columns of _____ = _____

_____ + _____ + _____ = _____

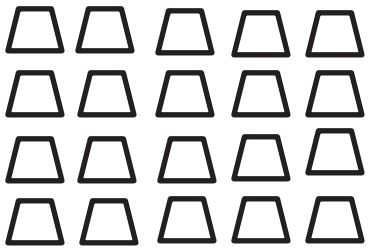
Circle rows.

c. 

4 rows of _____ = _____

___ + ___ + ___ + ___ = ___

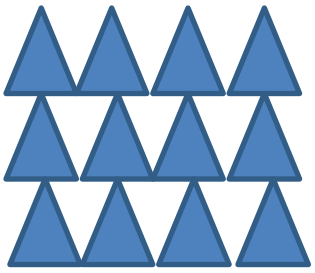
Circle columns.

d. 

5 columns of _____ = _____

___ + ___ + ___ + ___ + ___ = ___

2. Use the array of triangles to answer the questions below.



a. _____ rows of _____ = 12

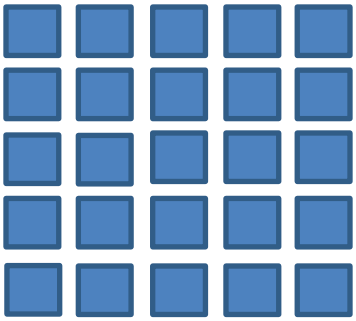
b. _____ columns of _____ = 12

c. _____ + _____ + _____ = _____

d. Add 1 more row. How many triangles are there now? _____

e. Add 1 more column to the new array you made in 2(d). How many triangles are there now? _____

3. Use the array of squares to answer the questions below.



a. _____ + _____ + _____ + _____ + _____ = _____

b. _____ rows of _____ = _____

c. _____ columns of _____ = _____

d. Remove 1 row. How many squares are there now? _____

e. Remove 1 column from the new array you made in 3(d). How many squares are there now? _____

Name _____ Date _____

1.

a. One row of an array is drawn below. Complete the array with Xs to make 3 rows of 4. Draw horizontal lines to separate the rows.

X X X X

b. Draw an array with Xs that has 3 columns of 4. Draw vertical lines to separate the columns. Fill in the blanks.

_____ + _____ + _____ = _____

3 rows of 4 = _____

3 columns of 4 = _____

2.

a. Draw an array of Xs with 5 columns of three.

b. Draw an array of Xs with 5 rows of three. Fill in the blanks below.

_____ + _____ + _____ + _____ + _____ = _____

5 columns of three = _____

5 rows of three = _____

In the following problems, separate the rows or columns with horizontal or vertical lines.

3. Draw an array of Xs with 4 rows of 3.

_____ + _____ + _____ + _____ = _____

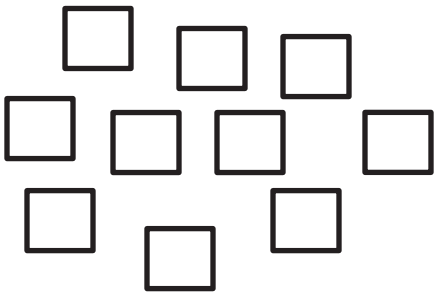
4 rows of 3 = _____

4. Draw an array of Xs with 1 more row of 3 than the array in Problem 3. Write a repeated addition equation to find the total number of Xs.

5. Draw an array of Xs with 1 less column of 5 than the array in Problem 4. Write a repeated addition equation to find the total number of Xs.

Name _____ Date _____

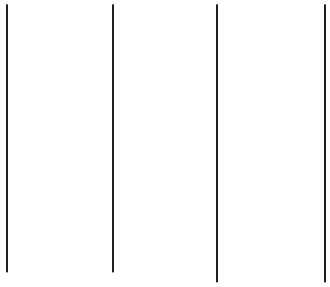
1. Create an array with the squares.



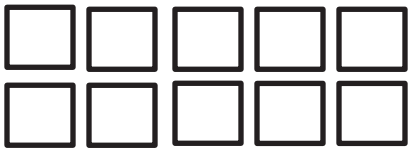
_____

_____

2. Create an array with the squares from the set above.



3. Use the array of squares to answer the questions below.



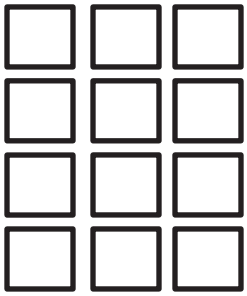
a. There are _____ squares in each row.

b. _____ + _____ = _____

c. There are _____ squares in each column.

d. _____ + _____ + _____ + _____ + _____ = _____

4. Use the array of squares to answer the questions below.



a. There are _____ squares in one row.

b. There are _____ squares in one column.

c. _____ + _____ + _____ = _____

d. 3 columns of _____ = _____ rows of ____ = ____ total.

5.

a. Draw an array with 8 squares that has 2 squares in each column.

b. Write a repeated addition equation to match the array.

6.

a. Draw an array with 20 squares that has 4 squares in each column.

b. Write a repeated addition equation to match the array.

c. Draw a tape diagram to match your repeated addition equation and array.

Name _____ Date _____

Draw an array for each word problem. Write a repeated addition equation to match each array.

1. Jason collected some rocks. He put them in 5 rows with 3 stones in each row. How many stones did Jason have altogether?

2. Abby made 3 rows of 4 chairs. How many chairs did Abby use?

3. There are 3 wires and 5 birds sitting on each of them. How many birds in all are on the wires?

4. Henry's house has 2 floors. There are 4 windows on each floor that face the street. How many windows face the street?

Draw a tape diagram for each word problem. Write a repeated addition equation to match each tape diagram.

5. Each of Maria's 4 friends has 5 markers. How many markers do Maria's friends have in all?

6. Maria also has 5 markers. How many markers do Maria and her friends have in all?

Draw a tape diagram and an array. Then, write a repeated addition equation to match.

7. In a card game, 3 players get 4 cards each. One more player joins the game. How many total cards should be dealt now?

Name _____ Date _____

Use your square tiles to construct the following rectangles with no gaps or overlaps. Write a repeated addition equation to match each construction.

1.

a. Construct a rectangle with 2 rows of 3 tiles.

_____

b. Construct a rectangle with 2 columns of 3 tiles.

_____

2.

a. Construct a rectangle with 5 rows of 2 tiles.

_____

b. Construct a rectangle with 5 columns of 2 tiles.

_____

3.

a. Construct a rectangle of 9 tiles that has equal rows and columns.

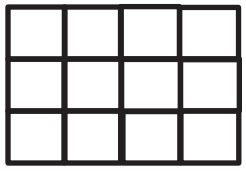
_____

b. Construct a rectangle of 16 tiles that has equal rows and columns.

_____

4.

a. What shape is the array pictured below? _____



b. Redraw the above shape with one column removed in the space below.

c. What shape is the array now? _____

Name _____ Date _____

Use your square tiles to construct the following arrays with no gaps or overlaps. Write a repeated addition equation to match each construction.

1.

a. Place 8 square tiles in a row.

b. Construct an array with the 8 square tiles.

c. Write a repeated addition equation to match the new array.

_____

2.

a. Construct an array with 12 squares.

b. Write a repeated addition equation to match the array.

_____

c. Rearrange the 12 squares into a different array.

d. Write a repeated addition equation to match the new array.

_____

3.

a. Construct an array with 20 squares.

b. Write a repeated addition equation to match the array.

_____

c. Rearrange the 20 squares into a different array.

d. Write a repeated addition equation to match the new array.

_____

4. Construct 2 arrays with 6 squares.

a. 2 rows of _____ = _____

b. 3 rows of _____ = 2 rows of _____

5. Construct 2 arrays with 10 squares.

a. 2 rows of _____ = _____

b. 5 rows of _____ = 2 rows of _____

Name _____ Date _____

1. Draw without using a square tile to make an array with 2 rows of 5.

2 rows of 5 = _____

_____ + _____ = _____

2. Draw without using a square tile to make an array with 4 columns of 3.

4 columns of 3 = _____

_____ + _____ + _____ + _____ = _____

3. Complete the following arrays without gaps or overlaps. The first tile has been drawn for you.

   a. 3 rows of 4

   b. 5 columns of 3

   c. 5 columns of 4

Name _____ Date _____

Use your square tiles to complete the steps for each problem.

Problem 1

Step 1: Construct a rectangle with 4 columns of 3.

Step 2: Separate 2 columns of 3.

Step 3: Write a number bond to show the whole and two parts. Then, write a repeated addition sentence to match each part of the number bond.

Problem 2

Step 1: Construct a rectangle with 5 rows of 2.

Step 2: Separate 1 row of 2.

Step 3: Write a number bond to show the whole and two parts. Write a repeated addition sentence to match each part of the number bond.

Problem 3

Step 1: Construct a rectangle with 5 columns of 3.

Step 2: Separate 3 columns of 3.

Step 3: Write a number bond to show the whole and two parts. Write a repeated addition sentence to match each part of the number bond.

4. Use 12 square tiles to construct a rectangle with 3 rows.
   a. _____ rows of _____ = 12
   b. Remove 1 row. How many squares are there now? _____
   c. Remove 1 column from the new rectangle you made in 4(b). How many squares are there now? _____

5. Use 20 square tiles to construct a rectangle.
   a. _____ rows of _____ = _____
   b. Remove 1 row. How many squares are there now? _____
   c. Remove 1 column from the new rectangle you made in 5(b). How many squares are there now? _____

6. Use 16 square tiles to construct a rectangle.
   a. _____ rows of _____ = _____
   b. Remove 1 row. How many squares are there now? _____
   c. Remove 1 column from the new rectangle you made in 6(b). How many squares are there now? _____

Name _____ Date _____

Cut out Rectangles A, B, and C. Then, cut according to directions. Answer each of the following using Rectangles A, B, and C.[1]

1. Cut out each row of Rectangle A.

   a. Rectangle A has _____ rows.

   b. Each row has _____ squares.

   c. _____ rows of _____ = _____

   d. Rectangle A has _____ squares.

2. Cut out each column of Rectangle B.

   a. Rectangle B has _____ columns.

   b. Each column has _____ squares.

   c. _____ columns of _____ = _____

   d. Rectangle B has _____ squares.

[1]*Note: This Problem Set is used with a template of three identical 2 by 4 arrays. These arrays are labeled as Rectangles A, B, and C.*

3. Cut out each square from both Rectangles A and B.

   a. Construct a new rectangle using all 16 squares.

   b. My rectangle has _____ rows of _____.

   c. My rectangle also has _____ columns of _____.

   d. Write two repeated addition sentences to match your rectangle.

4. Construct a new array using the 24 squares from Rectangles A, B, and C.

   a. My rectangle has _____ rows of _____.

   b. My rectangle also has _____ columns of _____.

   c. Write two number repeated addition sentences to match your rectangle.

Extension: Construct another array using the squares from Rectangles A, B, and C.

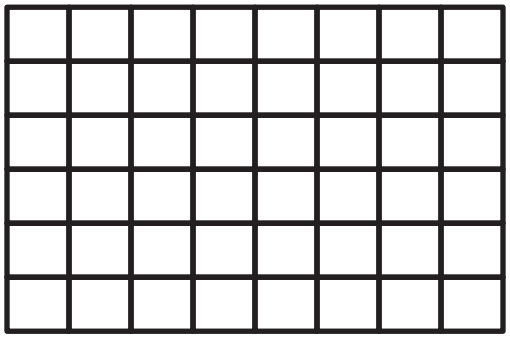
   a. My rectangle has _____ rows of _____.

   b. My rectangle also has _____ columns of _____.

   c. Write two repeated addition number sentences to match your rectangle.

Name _____ Date _____

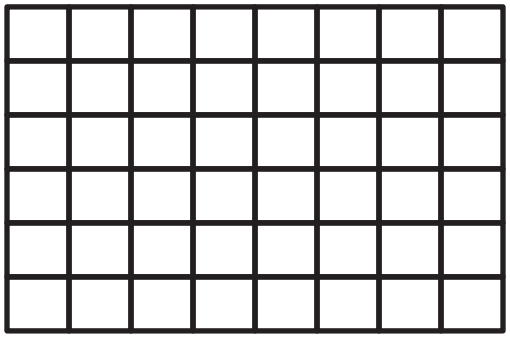
1. Shade in an array with 2 rows of 3.



Write a repeated addition equation for the array.

_____

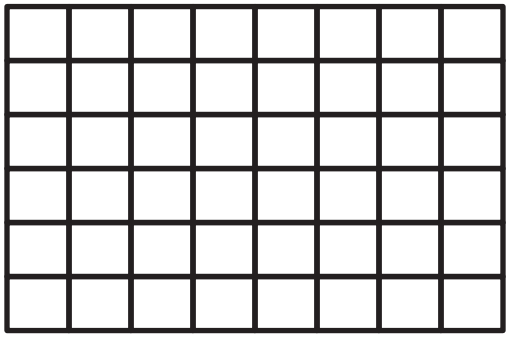
2. Shade in an array with 4 rows of 3.



Write a repeated addition equation for the array.

_____

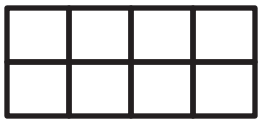
3. Shade in an array with 5 columns of 4.



Write a repeated addition equation for the array.

_____

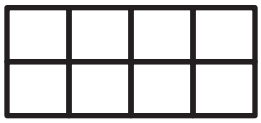
4. Draw one more column of 2 to make a new array.



Write a repeated addition equation for the new array.

_____

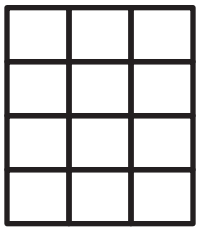
5. Draw one more row of 4, and then one more column to make a new array.



Write a repeated addition equation for the new array.

_____

6. Draw one more row and then two more columns to make a new array.



Write a repeated addition equation for the new array.

_____

Name _____ Date _____

Use your square tiles and grid paper to complete the following problems.

Problem 1

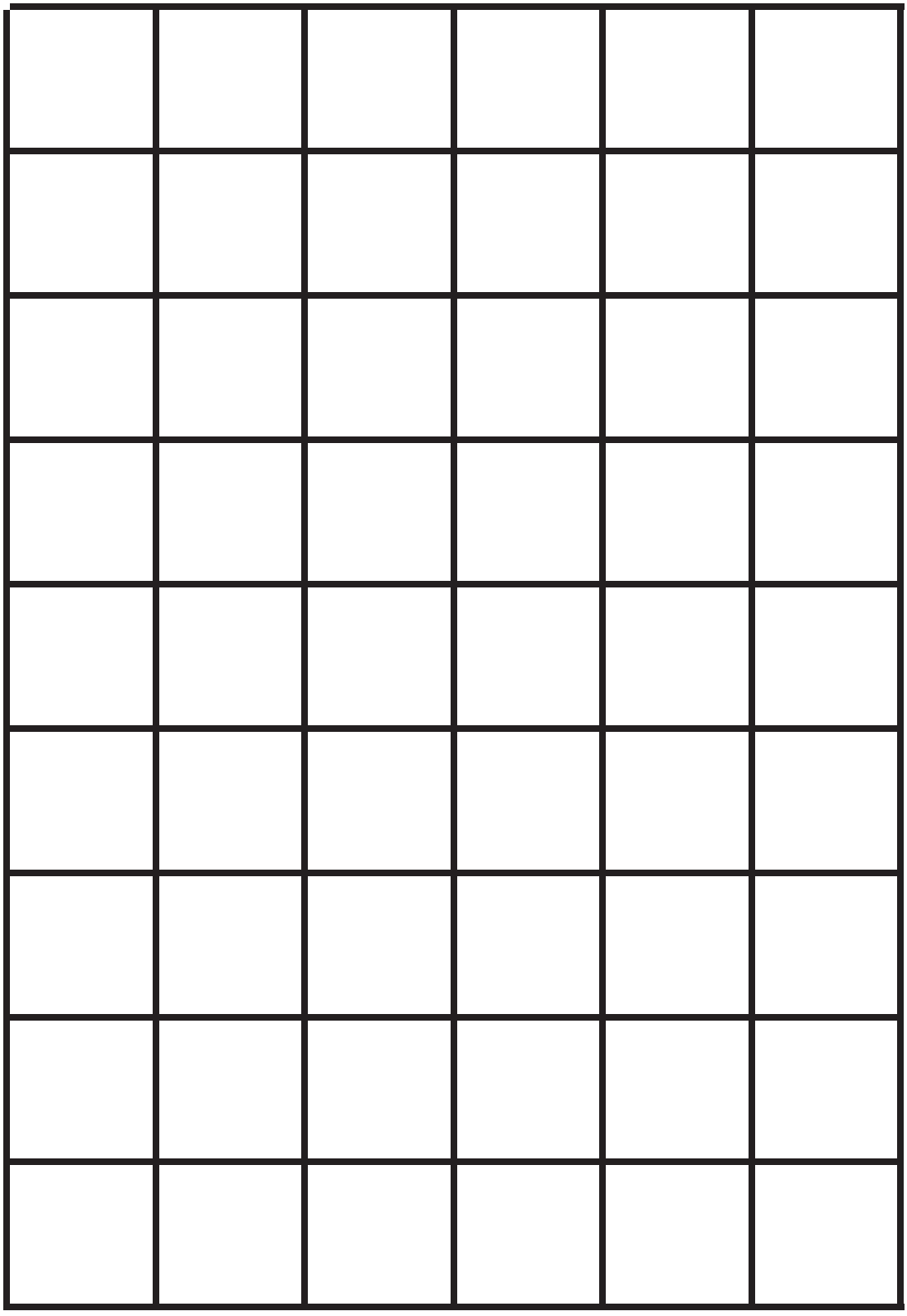
a. Cut out 10 square tiles.
b. Cut one of your square tiles in half diagonally.
c. Create a design.
d. Shade in your design on grid paper.

Problem 2

a. Use 16 square tiles.
b. Cut two of your square tiles in half diagonally.
c. Create a design.
d. Shade in your design on grid paper.
e. Share your second design with your partner.
f. Check each other's copy to be sure it matches the tile design.

Problem 3

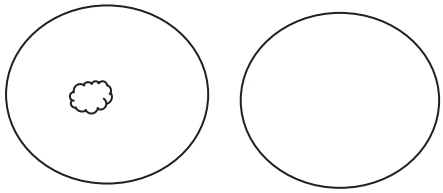
a. Create a 3 by 3 design with your partner in the corner of a new piece of grid paper.
b. With your partner, copy that design to fill the entire paper.



grid paper

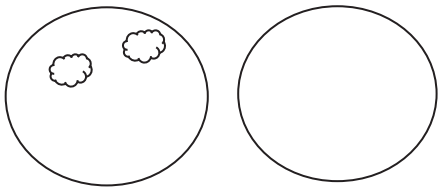
Name _____ Date _____

1. Draw to double the group you see. Complete the sentence, and write an addition equation.

a. 

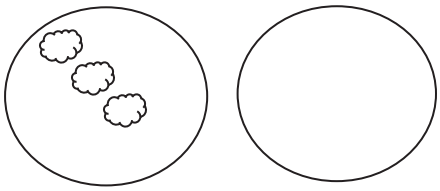
There is _____ cloud in each group.

_____ + _____ = _____

b. 

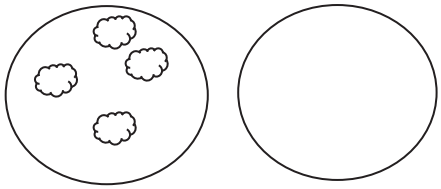
There are _____ clouds in each group.

_____ + _____ = _____

c. 

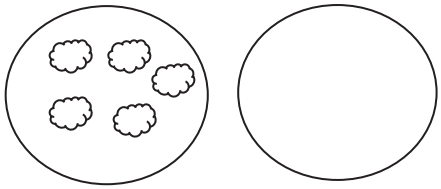
There are _____ clouds in each group.

_____ + _____ = _____

d. 

There are _____ clouds in each group.

_____ + _____ = _____

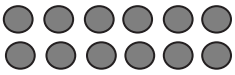
e. 

There are _____ clouds in each group.

_____ + _____ = _____

2. Draw an array for each set. Complete the sentences. The first one has been drawn for you.

a. **2 rows of 6**



2 rows of 6 = _____

_____ + _____ = _____

6 doubled is _____.

b. **2 rows of 7**

2 rows of 7 = _____

_____ + _____ = _____

7 doubled is _____.

c. **2 rows of 8**

2 rows of 8 = _____

_____ + _____ = _____

8 doubled is _____.

d. **2 rows of 9**

2 rows of 9 = _____

_____ + _____ = _____

9 doubled is _____.

e. **2 rows of 10**

2 rows of 10 = _____

_____ + _____ = _____

10 doubled is _____.

3. List the totals from Problem 1. _____

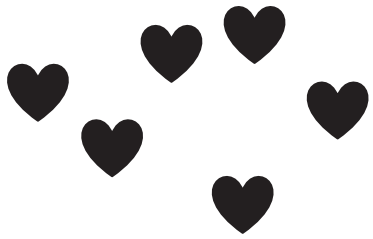
List the totals from Problem 2. _____

Are the numbers you have listed even or not even? _____

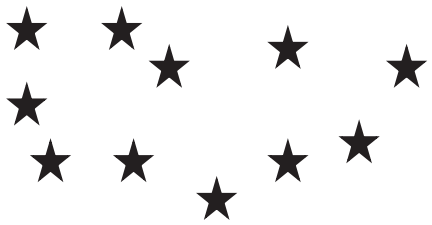
Explain in what ways the numbers are the same and different.

Name _____ Date _____

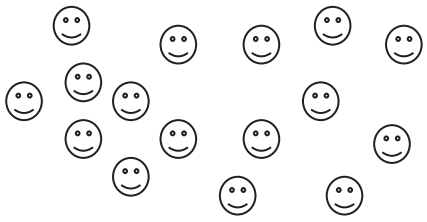
1. Pair the objects to decide if the number of objects is even.



Even/Not Even



Even/Not Even



Even/Not Even

2. Draw to continue the pattern of the pairs in the space below until you have drawn 10 pairs.

3. Write the number of dots in each array in Problem 2 in order from least to greatest.

4. Circle the array in Problem 2 that has 2 columns of 7.

5. Box the array in Problem 2 that has 2 columns of 9.

6. Redraw the following sets of dots as columns of two or 2 equal rows.

a. 

b. 

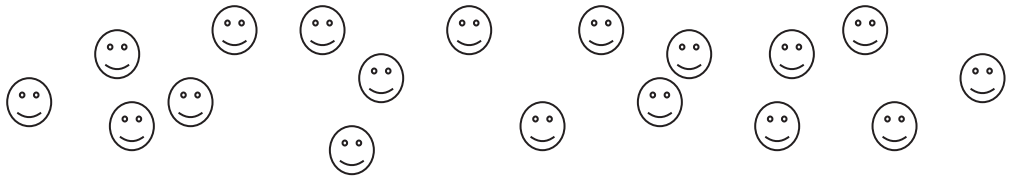
There are _____ dots.

Is ____ an even number? _____

There are _____ dots.

Is ____ an even number? _____

7. Circle groups of two. Count by twos to see if the number of objects is even.



a. There are _____ twos. There are _____ left over.

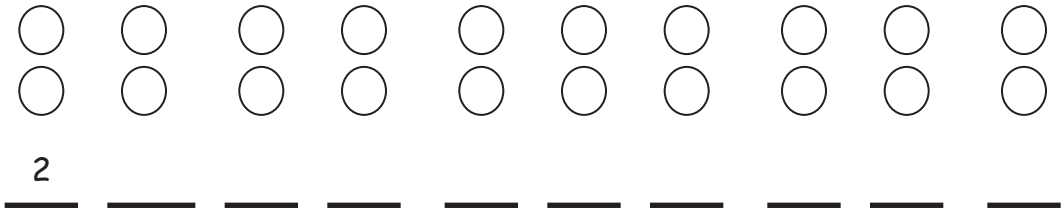
b. Count by twos to find the total.

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

c. This group has an even number of objects: True or False

Name _____ Date _____

1. Skip-count the columns in the array. The first one has been done for you.



2 ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

2. a. Solve.

1 + 1 = _____

2 + 2 = _____

3 + 3 =_____

4 + 4 = _____

5 + 5 = _____

6 + 6 = _____

7 + 7 = _____

8 + 8 = _____

9 + 9 = _____

10 + 10 = _____

b. Explain the connection between the array in Problem 1 and the answers in Problem 2(a).

_____

_____

_____

3. a. Fill in the missing numbers on the number path.

20, 22, 24, _____, 28, 30, _____, _____, 36, _____, 40, _____, _____, 46, _____, _____

b. Fill in the odd numbers on the number path.

0, ___, 2, ___, 4, ___, 6, ___, 8 ___, 10, ___, 12, ___, 14, ___, 16, ___, 18, ___, 20, ___

4. Write to identify the **bold** numbers as even or odd. The first one has been done for you.

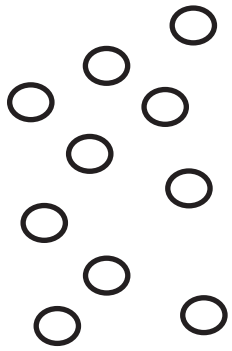
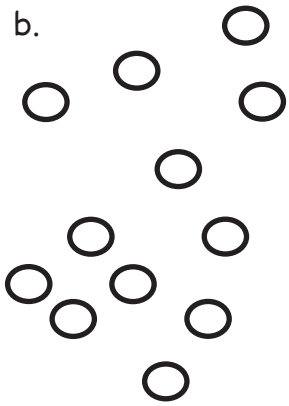
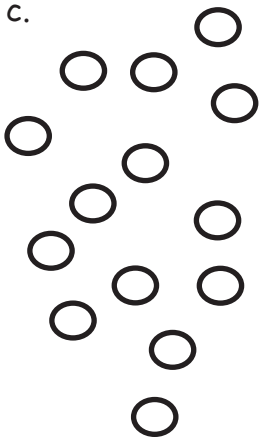
a. **6** + 1 = **7** even + 1 = odd	b. **24** + 1 = **25** _____ + 1 = _____	c. **30** + 1= **31** _____ + 1 = _____
d. **6** – 1 = **5** _____ - 1 = _____	e. **24** – 1 = **23** _____ - 1 = _____	f. **30** – 1 = **29** _____ - 1 = _____

5. Are the **bold** numbers even or odd? Circle the answer, and explain how you know.

a. **28** even/odd	Explanation:
b. **39** even/odd	Explanation:
c. **45** even/odd	Explanation:
d. **50** even/odd	Explanation:

Name _____ Date _____

1. Use the objects to create an array.

a. 	Array There are an even/odd (circle one) number of circles.	Redraw your picture with 1 *less* circle. There are an even/odd (circle one) number of circles.
b. 	Array There are an even/odd (circle one) number of circles.	Redraw your picture with 1 *more* circle. There are an even/odd (circle one) number of circles.
c. 	Array There are an even/odd (circle one) number of circles.	Redraw your picture with 1 *less* circle. There are an even/odd (circle one) number of circles.

2. Solve. Tell if each number is odd (O) or even (E). The first one has been done for you.

a. 6 + 4 = 10

E + E = E

b. 17 + 2 = _____

_____ + _____ = _____

c. 11 + 13 = _____

_____ + _____ = _____

d. 14 + 8 = _____

_____ + _____ = _____

e. 3 + 9 = _____

_____ + _____ = _____

f. 5 + 14 = _____

_____ + _____ = _____

3. Write two examples for each case. Write if your answers are even or odd. The first one has been started for you.

a. Add an even number to an even number.

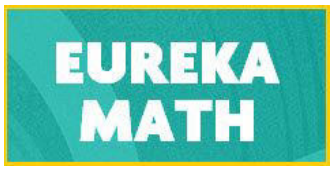
32 + 18 = 40 even _____

b. Add an odd number to an even number.

_____ _____

c. Add an odd number to an odd number.

_____ _____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MATH

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