Homework Helpers

Grade 2 Module 6

G2-M6-Lesson 1

$2 + 2 + 2 = 6$
I can think $2 + 2 = 4$ and $4 + 2 = 6$.

$3 \times 2 = 6$
I can think 3 groups of 2 equals 6.

Repeated addition in Grade 2 ... leads to multiplication in Grade 3.

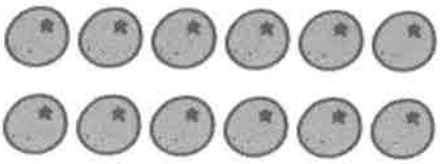
By putting the apples into groups of 2, I create 5 equal groups of two apples.

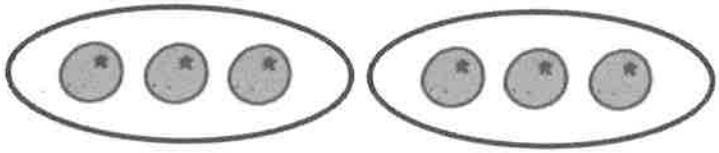
1. Circle groups of two apples.

There are __5__ groups of two apples.

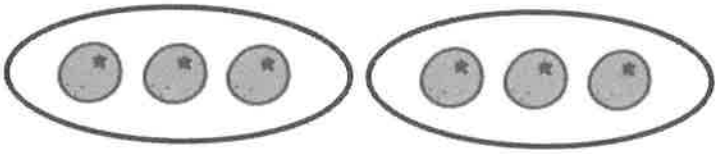
I can make different equal groups out of the same total.

2. Redraw the 12 oranges into 4 equal groups.



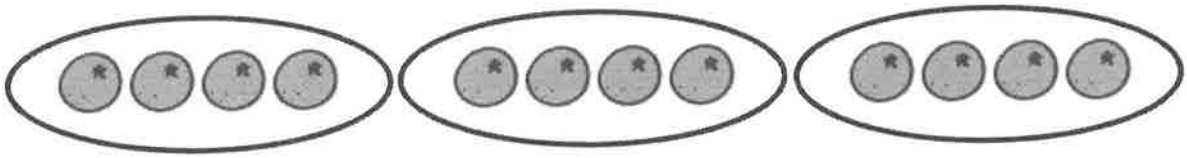


I can group 12 oranges into 4 groups of 3 or 3 groups of 4.



4 groups of __3__ oranges

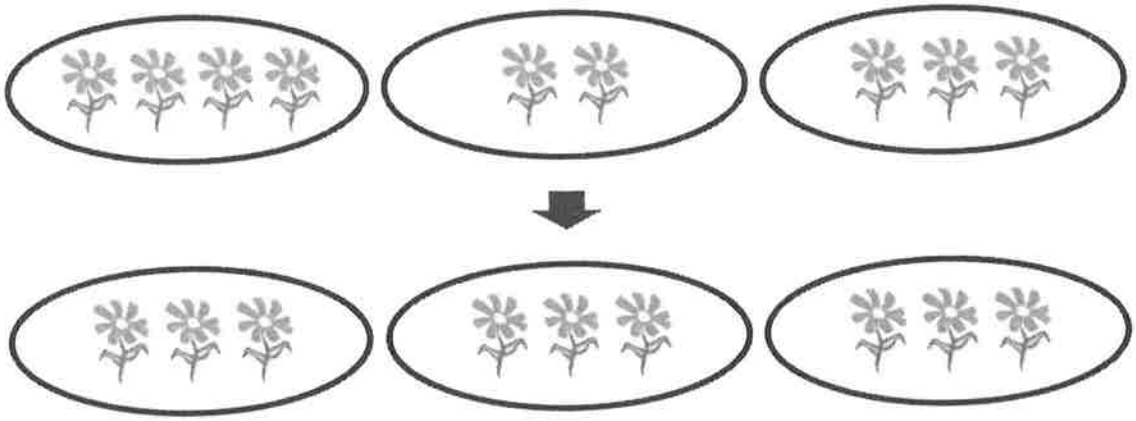
3. Redraw the 12 oranges into 3 equal groups.



3 groups of 4 oranges

I can turn unequal groups into equal groups.

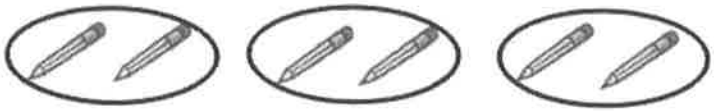
4. Redraw the flowers to make each of the 3 groups have an equal number.



3 groups of 3 flowers = 9 flowers.

G2-M6-Lesson 2

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



2 + 2 + 2 = 6

3 groups of 2 = 6

There are 2 pencils in each group, so the repeated addition sentence is 2 + 2 + 2 = 6. We can say 3 groups of 2 equals 6.

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

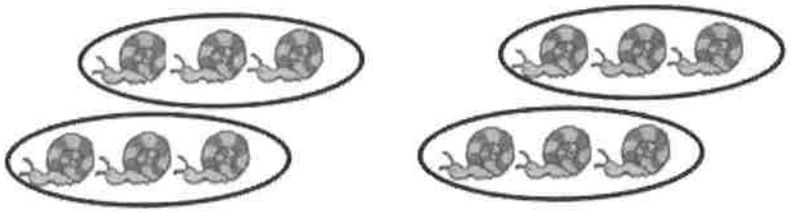
3 + 3 + 3 + 3 = 12

4 groups of 3 = 12

When I draw another group of 3 boxes, I have to add another 3 to the repeated addition sentence because now there are 4 groups of 3.

G2-M6-Lesson 3

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



3 + 3 + 3 + 3 = 12

6 + 6 = 12

4 groups of 3 = 2 groups of 6

I can group addends into pairs and use doubles to add quickly. I know 3 + 3 = 6, and since there are two sixes, I can add 6 + 6 to get 12.

2.

3 + 3 + 3 + 3 + 3 = 15

6 + 6 + 3 = 15

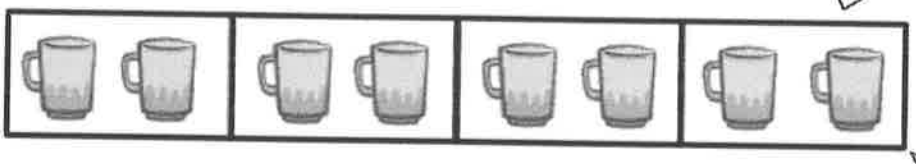
12 + 3 = 15

If there is an extra addend, I can still use doubles and then just add on that extra amount.

G2-M6-Lesson 4

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

This tape diagram drawing helps me see that there are 4 groups with 2 cups in each group.



The boxes represent the groups.

2 + 2 + 2 + 2 = 8

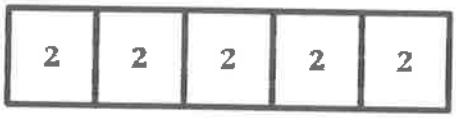
4 groups of 2 = 8

To find the total, I add 4 groups of 2.

2 + 2 + 2 + 2 = 8

2. Draw a tape diagram to find the total.

5 groups of 2



There are 2 in each group. Instead of drawing a picture, I can just write the number 2 in each box.

The boxes represent the groups. There are 5 groups, so I draw 5 boxes.

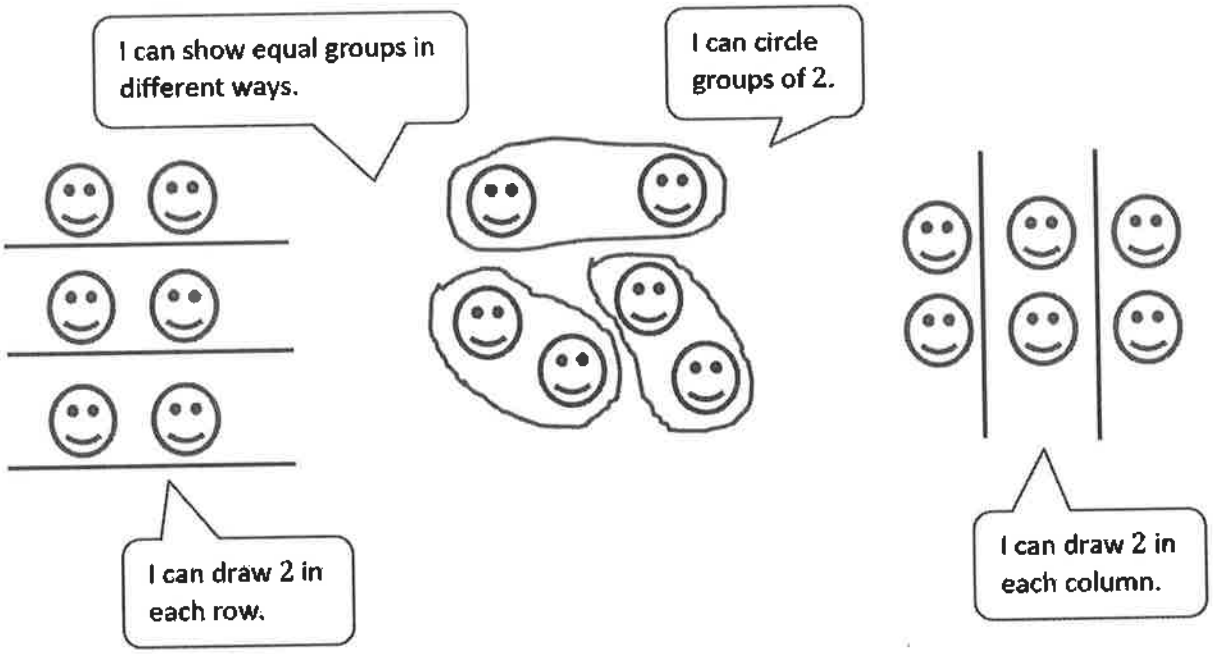
2 + 2 + 2 + 2 + 2 = 10

To find the total, I add 5 groups of 2.

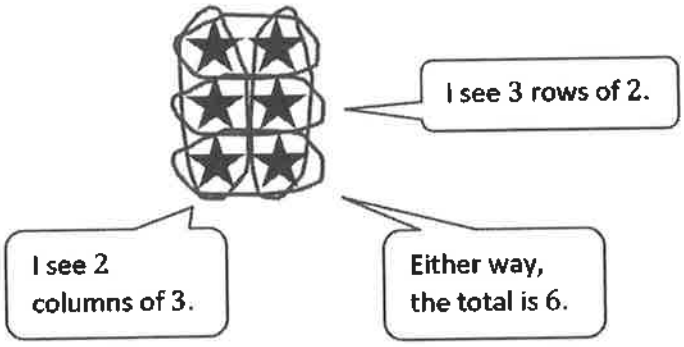
2 + 2 + 2 + 2 + 2 = 10

G2-M6-Lesson 5

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

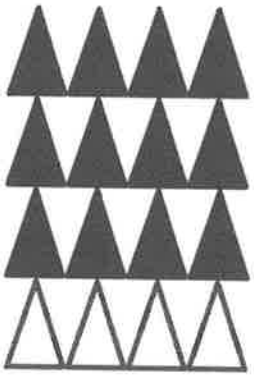


2. Count the objects in the array from left to right by rows and top to bottom by columns. As you count, circle the rows and then the columns.



G2-M6-Lesson 6

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



a. 3 rows of 4 = 12

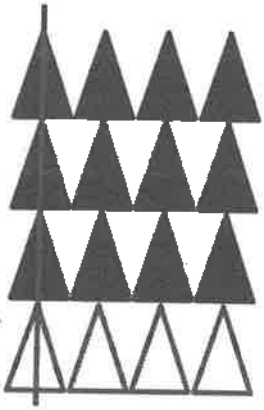
b. 4 columns of 3 = 12

c. 4 + 4 + 4 = 12

d. Add 1 more row. How many triangles are there now? 16

When another row or column is added so is another group, or unit. I just think 12 + 4 = 16.

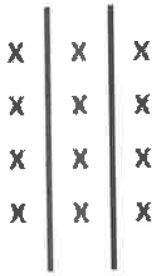
e. Remove 1 column from the new array you made. How many triangles are there now? 12



When a row or column is removed, I take away one group, or unit. I know 4 less than 16 is 12.

G2-M6-Lesson 7

1. Draw an array with X's that has 3 columns of 4. Draw vertical lines to separate the columns. Fill in the blanks.



$\_4\_ + \_4\_ + \_4\_ = \_12\_$

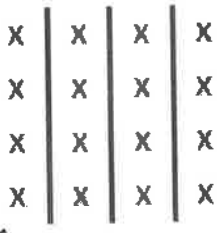
3 columns of 4 = $\_12\_$

3 rows of 4 = $\_12\_$

In this problem, the column is the group, but I can imagine turning the array on its side and seeing 3 rows of 4.

3 columns of 4 and 3 rows of 4 is the same array. It's just a different way of looking at the same amount!

2. Draw an array of X's with 1 more column of 4 than the array shown above. Write a repeated addition equation to find the total number of X's.



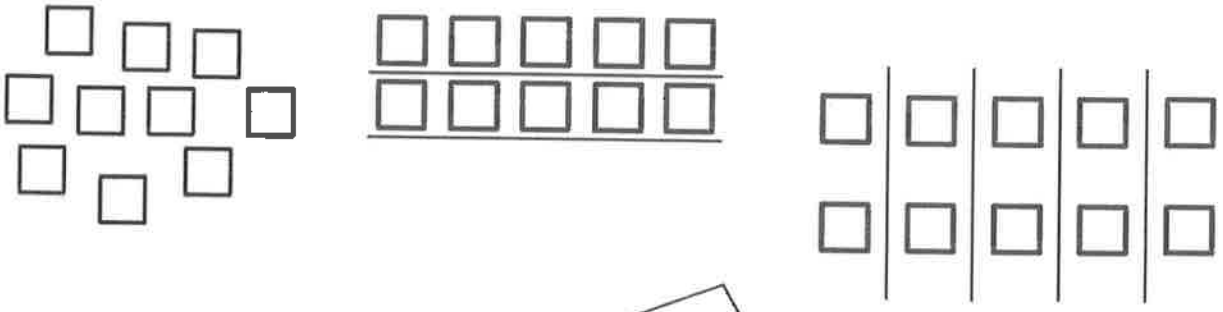
$4 + 4 + 4 + 4 = 16$

When I add another column, the total goes up by 4 because there is another group of 4.

If I take away a row or column, the total will go down by 4 because I took away a group of 4.

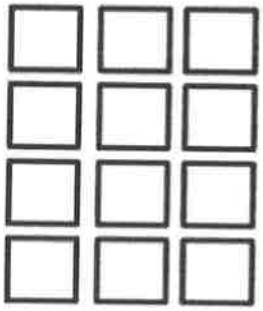
G2-M6-Lesson 8

1. Create an array with the squares.



I can build an array with 2 rows of 5 or 5 columns of 2. They both show the same total!

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



a. There are 3 squares in one row.

b. There are 4 squares in one column.

c. 4 + 4 + 4 = 12

d. 3 columns of 4 = 4 rows of 3 = 12 total.

Since there are 3 addends, I know this repeated addition equation relates to the columns.

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

The column is the group, so I draw 3 boxes to show 3 groups.

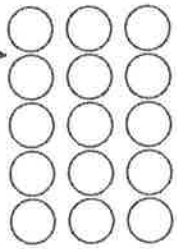
There are 4 squares in each column, so 4 is the unit I am counting.

G2-M6-Lesson 9

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

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

I draw an array to show 5 rows of 3 and label the drawing "stones."



stones

$3 + 3 + 3 + 3 + 3 = 15$

I write a repeated addition equation to match the array.

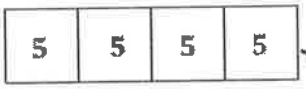
Jason had 15 stones altogether.

I write a sentence to answer the question.

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

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

The 4 friends are the groups. I draw 4 boxes to show 4 groups.



I write the number 5 in each box to show how many markers each friend has.

$5 + 5 + 5 + 5 = 20$

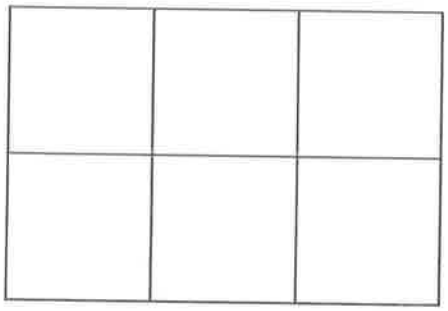
Maria's friends have 20 markers in all.

I write a repeated addition equation to match the tape diagram and a sentence to answer the question.

G2-M6-Lesson 10

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

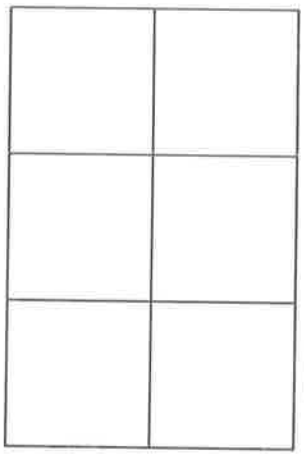
Construct a rectangle with 2 rows of 3 tiles.



$3 + 3 = 6$

I made 2 rows of 3 tiles. My array is a rectangle!

Construct a rectangle with 2 columns of 3 tiles.



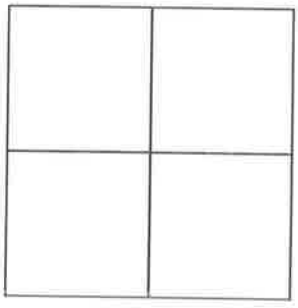
$3 + 3 = 6$

I made 2 columns of 3 tiles. My array is a rectangle!

The equations and totals for both arrays are the same because both show 2 groups of 3.

2. Construct a rectangle of 4 tiles that has equal rows and columns. Write a repeated addition equation to match.

There are 2 rows and 2 columns.

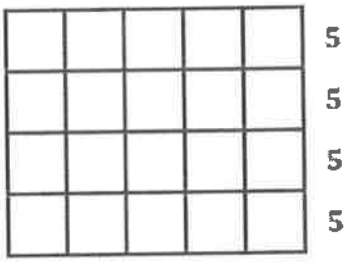


I put the same number of square tiles in the rows as in the columns, so I made a square!

$2 + 2 = 4$

G2-M6-Lesson 11

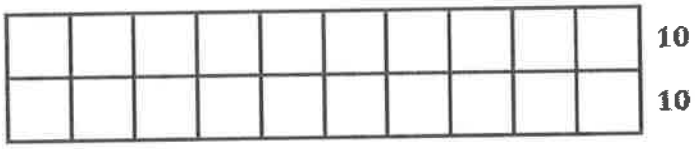
1. Construct an array with 20 square tiles.



Write a repeated addition equation to match the array.

$5 + 5 + 5 + 5 = 20$

Rearrange the 20 square tiles into a different array.



I can make an array with 4 rows of 5 tiles and write a repeated addition equation to match. It's easy to skip-count by 5's.

Write a repeated addition equation to match the new array.

$10 + 10 = 20$

I can rearrange the tiles to make another array with 2 rows of 10 tiles. I can use my doubles facts to find the total: $10 + 10 = 20$.

2. Construct 2 arrays with 16 square tiles.

2 rows of 8 = 16

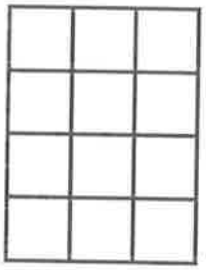
2 rows of 8 = 8 rows of 2

If I turn 2 rows of 8 so they're standing up, I will have 8 rows of 2. I know that $8 + 8$ equals $2 + 2 + 2 + 2 + 2 + 2 + 2 + 2$.

G2-M6-Lesson 12

1. Trace a square tile to make an array with 3 columns of 4.

It is important for me to be precise when I am tracing a tile to make an array. I can't have gaps or overlaps.



This rectangle shows that I can compose a larger unit from smaller units. Each column is a unit of 4. There are 3 columns of 4, so $4 + 4 + 4 = 12$.

3 columns of 4 = 12

4 + 4 + 4 = 12

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

5 rows of 2

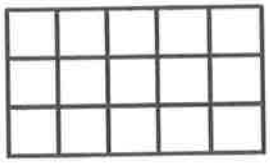
First, I can start with the top side of the next square. The length of the line is about the same length as the first tile. Next, I can draw the bottom line of the square to match the length of the top line.

Then, I can close the square by making a third line.

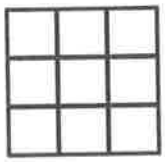
I can continue this pattern to make 4 more rows of 2 directly below the first two squares.

G2-M6-Lesson 13

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

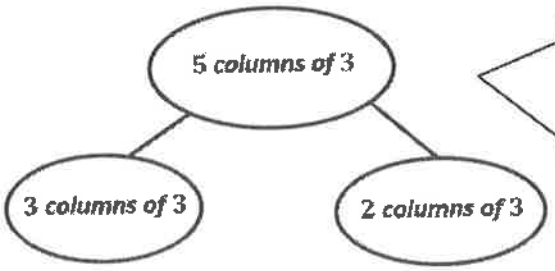


Step 2: Separate 3 columns of 3.



I decompose 5 columns of 3 into 2 smaller rectangles, or parts. 3 columns of 3 and 2 columns of 3 make 5 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.



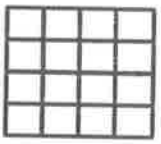
$3 + 3 + 3 = 9$

$3 + 3 = 6$

I can draw a number bond to match my arrays. I know that a larger rectangle can be decomposed into smaller rectangles because 15 can be decomposed into 9 and 6.

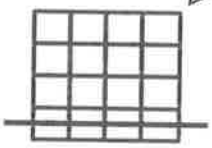
2. Use 16 square tiles to construct a rectangle.

a. 4 rows of 4 = 16

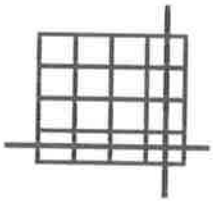


I can remove a row, which is a unit of 4, so my new rectangle has 12 square tiles. $4 + 4 + 4 = 12$

b. Remove 1 row. How many square tiles are there now? 12



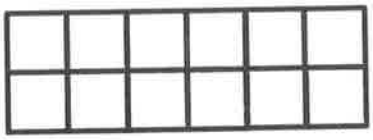
c. Remove 1 column from the new rectangle you made in part (b). How many square tiles are there now? 9



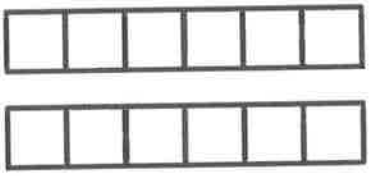
Now I can remove a column, which is a unit of 3. My new rectangle has 3 fewer square tiles than part (b). $3 + 3 + 3 = 9$

G2-M6-Lesson 14

1. Imagine that you have just cut this rectangle into rows.



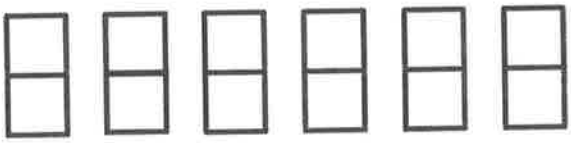
   a. What do you see? Draw a picture.



I can decompose the same rectangle into rows and columns. I can see 2 rows of 6.

   How many squares are in each row? 6

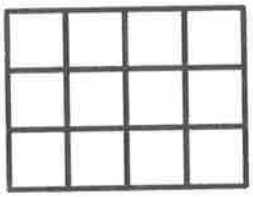
   b. Imagine that you have just cut this rectangle into columns. What do you see? Draw a picture.



   How many squares are in each column? 2

I can also see 6 columns of 2.

2. Create another rectangle using the same number of squares.



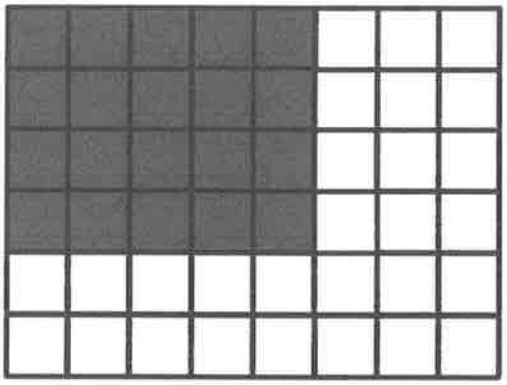
I can make another rectangle with the same 12 squares. I can rearrange 2 columns of 2 as 1 row of 4. Now, my rectangle has 3 rows of 4.

   How many squares are in each row? 4

   How many squares are in each column? 3

G2-M6-Lesson 15

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



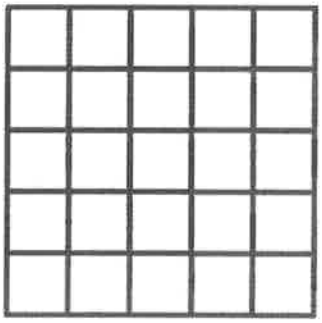
I can shade 1 column of 4 and then 4 more columns of 4. I can say that each column has a group, or unit, of 4.

Write a repeated addition equation for the array.

$4 + 4 + 4 + 4 + 4 = 20$

I see 5 columns of 4, or 5 fours. I can use doubles to add. $8 + 8 + 4 = 20$. I have shaded 20 squares altogether.

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



First, I can draw another row of 3. Now there are 5 rows of 3. Then I can draw 2 more columns. That makes 5 columns of 5 altogether.

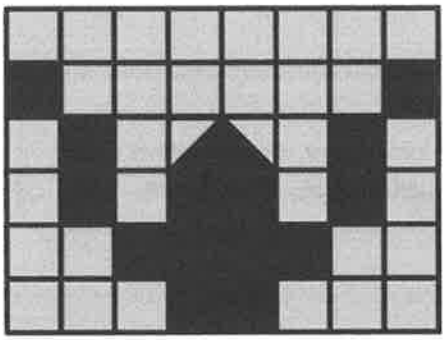
Write a repeated addition equation for the new array.

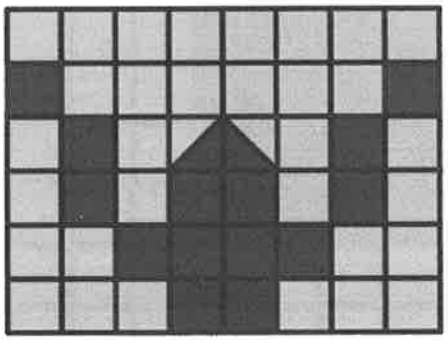
$5 + 5 + 5 + 5 + 5 = 25$

I see 5 columns of 5, or 5 fives. I can skip-count by 5's. There are 25 squares in all.

G2-M6-Lesson 16

1. Shade to create a copy of the design on the empty grid.

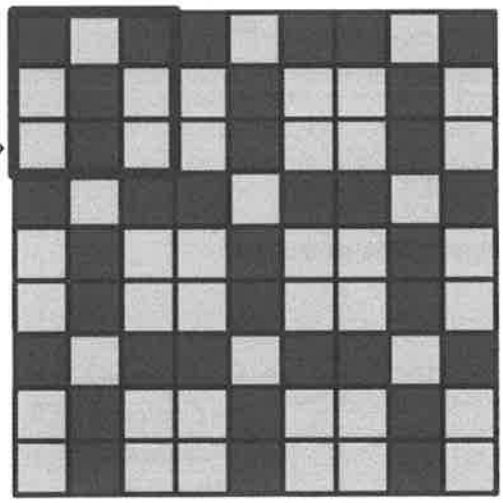




I can use square tiles to put together and break apart rectangles. Look, I see that some squares are only half-shaded to make triangles! When I make designs, I have to pay close attention to the rows and columns so that I shade in the correct squares.

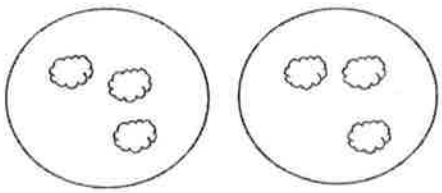
2. Use colored pencils to create a design in the bolded square section. Create a tessellation by repeating the design throughout.

The core unit that I am repeating has 3 rows and 3 columns. I can create the same design again by shading in the same pattern. I know that this pattern could go on and on if I kept repeating it.



G2-M6-Lesson 17

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



There are 3 clouds in each group.

3 + 3 = 6

I know that when both addends are the same, I have doubles. 1 + 1 = 2, 2 + 2 = 4, 3 + 3 = 6, and so on. Doubling a number always makes an even number even when there are 3 objects in each group.

2. Draw an array for the set below. Complete the sentences.

2 rows of 5

2 rows of 5 = 10

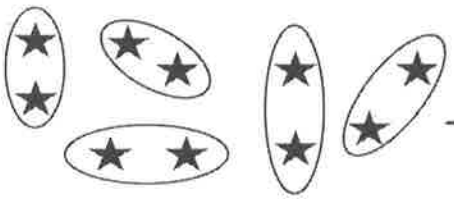
5 + 5 = 10

5 doubled is 10.

There are 5 counters in each group. I can double a row of 5 and write a number sentence to match, 5 + 5 = 10. When I look at this array, I know right away that there is an even number of objects because I am doubling a number, 5.

G2-M6-Lesson 18

1. Pair the objects, and count by twos to decide if the number of objects is even.



(Even)/Not Even

There are 10 stars. The number of objects is even because when I pair them, there are no stars left over.

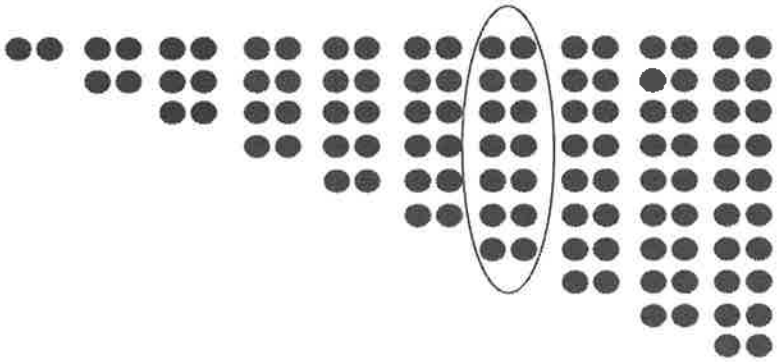
There are 5 twos. There are 0 twos left over.

Count by twos to find the total.

2, 4, 6, 8, 10

10 is even because I can say 10 when counting by twos.

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



This is just like when we line up side by side to go to lunch! Each person has a partner. When I count by twos, I say, "2, 4, 6, 8, ..." These are even numbers!

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

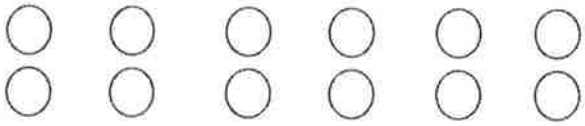
2, 4, 6, 8, 10, 12, 14, 16, 18, 20

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

I can make 2 columns of 7, and $7 + 7 = 14$. Even if one of the numbers I'm adding isn't even, when I double it, I get an even number.

G2-M6-Lesson 19

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



2 4 6 8 10 12

I can skip-count by 2's using the columns of the array. If I keep adding columns of 2 to this pattern, I can say, "..., 14, 16, 18, 20." There's a pattern in the ones place! 0, 2, 4, 6, 8.

2. Solve.

$1 + 1 =$ 2	$4 + 4 =$ 8
$2 + 2 =$ 4	$5 + 5 =$ 10
$3 + 3 =$ 6	$6 + 6 =$ 12

When I find doubles, I see a pattern in the answers; they are skip-counting by 2's.

3. Write to identify the **bold** numbers as *even* or *odd*.

24 + 1 = 25	**24 − 1 = 23**
even + 1 = *odd*	*even* − 1 = *odd*

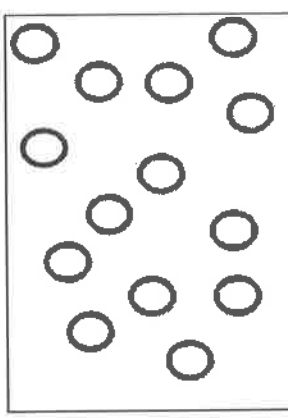
When I add 1 to or subtract 1 from an even number, the new number is always odd!

4. Is the **bold** number even or odd? Circle the answer, and explain how you know.

39	**Explanation:**
even (odd)	*This number does not have 0, 2, 4, 6, or 8 in the ones place. I know that 40 is even, so 40 − 1 has to be odd.*

G2-M6-Lesson 20

1. Use the objects to create an array.



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.

If I draw the array with 1 less circle, there are an odd number of circles. Now, I don't see 2 equal groups of 7.

2. Solve. Tell if each number is odd (O) or even (E).

11 + 13 = 24

O + O = E

I know that 11 and 13 are odd because they do not have 0, 2, 4, 6 , or 8 in the ones place. When I add two odd numbers, I get an even number.

3. Write two examples for each case; next to your answer, write if your answers are even or odd.

Add an even number to an odd number.

12 + 7 = 19 *odd* 8 + 13 = 21 *odd*

I know that when I add an even number and an odd number, the sum will be odd. I cannot make 2 equal groups with 21 tiles, and I can't count by twos to 21.