

Lesson 2.1

Equal Groups

Purpose	Materials
<ul style="list-style-type: none"> Practice repeated addition Understand multiplication as repeated addition Write multiplication equations to match equal groups 	<ul style="list-style-type: none"> Counters 5 small boxes or bowls
Memory Work	<ul style="list-style-type: none"> Are times in the morning a.m. or p.m.? <i>A.m.</i> Are times in the afternoon and evening a.m. or p.m.? <i>P.m.</i>

Warm-up: Practice Repeated Addition

Ask your child the following repeated addition questions orally:

- What's 5 plus 5? 10. Plus 5? 15. Plus 5? 20. Plus 5? 25.
- What's 4 plus 4? 8. Plus 4? 12. Plus 4? 16. Plus 4? 20.
- What's 3 plus 3? 6. Plus 3? 9. Plus 3? 12. Plus 3? 15.

This activity previews using repeated addition to solve multiplication problems.

Activity (A): Introduce Multiplication at the Cookie Store

Today, we'll start a brand-new math topic: multiplication! Multiplication is a very important math skill, like addition and subtraction. We'll spend a lot of time on it this year.

Let's pretend you work at the Cookie Store. Place 3 small boxes or bowls on the table and place 4 counters in each box to match the picture. One day, a customer buys 3 boxes of cookies. Each box has 4 cookies.



Modeling the picture with real counters and boxes makes the concept of multiplication more concrete. It also previews using counters to solve multiplication problems in the next activity.

One way to find the number of cookies is with repeated addition. What's 4 plus 4 plus 4? 12. Write 12 in the blank.

Repeated addition works fine if there are only a few groups. But if a customer bought more boxes, it could take a long time to find the total number of cookies! Multiplication is a faster way to add equal groups and find the total.

Point to the times sign in 3×4 . This sign is called the times sign. It means to multiply the numbers together. We read this problem as "3 times 4."

$$3 \times 4 = \square$$

↑
Times sign

A

The first number tells how many groups we have, and the second number tells how many are in each group. So, 3 times 4 means 3 groups of 4. What does 3 times 4 equal? 12. Write 12 in the blank.


Multiplication A

3 groups of 4

$3 \times 4 = \square$

Number of groups How many in each group


Have your child help you write a repeated addition equation and multiplication equation for the other cookie pictures.



2 groups of 6

$6 + 6 = 12$

$2 \times 6 = 12$



5 groups of 3

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

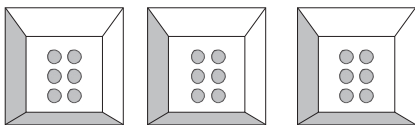
$5 \times 3 = 15$

This definition of the first and second numbers is only a convention, and not a hard-and-fast mathematical definition. (In fact, some math programs describe 3×4 in the opposite way, with 3 as the size of the groups and 4 as the number of groups.) As your child will learn in Lesson 2.2, we can multiply in any order, and so the final answer does not depend on the order of the factors. It's fine if your child writes multiplication equations in either order, as long as she understands the underlying concept of equal groups.

Activity (B): Multiply at the Cookie Store

Let's pretend that you work at the Cookie Store, and I'm the customer buying cookies. I'd like 3 boxes of 6, please. Have your child fill 3 boxes or bowls with 6 counters each.

What multiplication problem matches my order? 3 times 6. How many cookies are in my order? 18. If your child isn't sure, prompt her to add $6 + 6 + 6$. Write the matching multiplication equation in the chart.



Cookie Order	Multiplication Equation
3 boxes of 6	$3 \times 6 = 18$

Repeat with the other cookie orders in part B. Have your child create each order with counters. Then, write the matching equation in the chart.

Cookie Order	Multiplication Equation
3 boxes of 6	$3 \times 6 = 18$
4 boxes of 4	$4 \times 4 = 16$
1 box of 8	$1 \times 8 = 8$
2 boxes of 7	$2 \times 7 = 14$
5 boxes of 2	$5 \times 2 = 10$

Independent Practice and Review

Have your child complete the Lesson 2.1 Practice and Review pages.

Lesson 2.2

Arrays

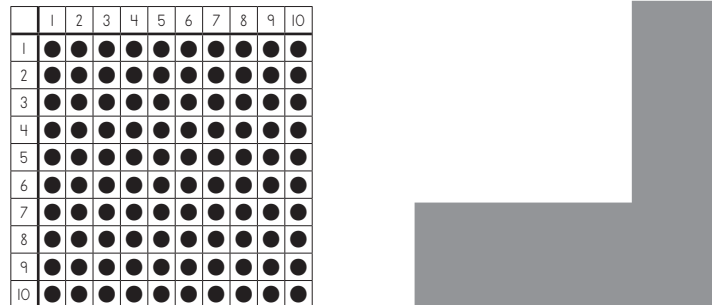
Purpose	Materials
<ul style="list-style-type: none"> Review rows and columns Write multiplication equations to match arrays Draw arrays 	<ul style="list-style-type: none"> Dot array and L-cover (Blackline Master 5)
Memory Work	<ul style="list-style-type: none"> What is another name for 12 a.m.? <i>Midnight.</i> What is another name for 12 p.m.? <i>Noon.</i>

You will need the dot array and L-cover (Blackline Master 5) for the first time in this lesson. Before the lesson, cut out the L-cover along the dotted lines and place the dot array in a plastic page protector. Keep the dot array and L-cover in your math binder.

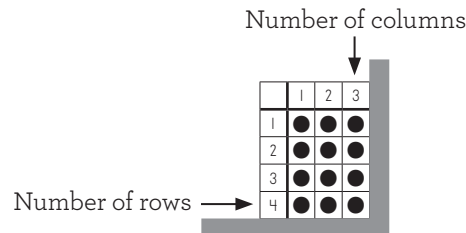
Warm-up: Review Rows and Columns on the Dot Array

In the last lesson, you learned how to write multiplication equations for equal groups. Today, you'll learn how to write multiplication equations for arrays.

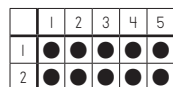
Show your child the dot array and L-cover (Blackline Master 5). This is called the dot array. An array is a group of objects arranged in rows and columns.



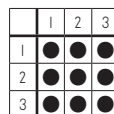
Slide the L-cover over the dot array so that 4 rows of 3 are showing. The numbers on the top and side tell the number of rows and columns so you don't have to count. How many rows are in this array? 4. How many columns are in this array? 3.



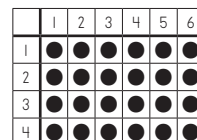
Use the L-cover to show your child the following arrays. Have your child tell how many rows and columns are in each array.



2 rows and 5 columns.



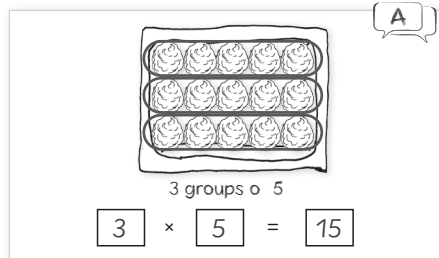
3 rows and 3 columns.



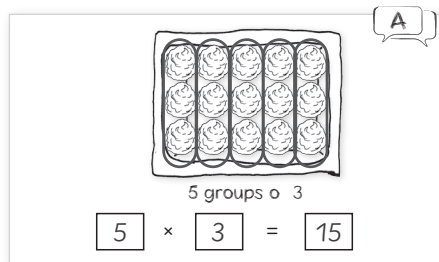
4 rows and 6 columns.

Activity (A): Write Multiplication Equations for Arrays

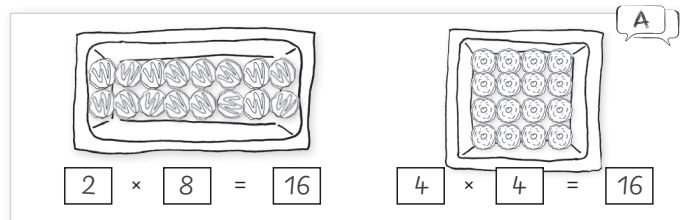
Bakers often arrange cupcakes and muffins in arrays. We can think of each row of muffins as a group. How many rows of muffins are there? 3. How many muffins are in each row? 5. So, we have 3 groups of 5. What multiplication problem means 3 groups of 5? 3 times 5. How many muffins are there in all? 15. Write the matching multiplication equation in the blanks.



Or, we can think of each column as a group of muffins. How many columns of muffins are there? 5. How many muffins are in each column? 3. So, we have 5 groups of 3. What multiplication problem means 5 groups of 3? 5 times 3. How many muffins are there in all? 15. Write the matching multiplication equation in the blanks.



The answer to a multiplication problem is called the *product*. What do you notice about the products in these two problems? *They're equal!* We can multiply numbers in any order, just like we can add numbers in any order. Complete the other equations to match the arrays.



Your child may write the factors in multiplication equations in either order.

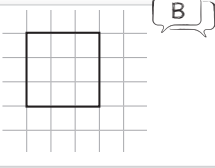
Activity (B): Draw Arrays at the Window Factory

Builders often create arrays when they lay bricks, lay tiles, or install windows. Briefly look around your home for bricks, tiles, or panes of glass arranged in arrays.

Let's pretend you design windows at a window factory. Each window is made from an array of glass squares. Your job is to draw the plan for each window before it's made and find how many glass squares are needed.

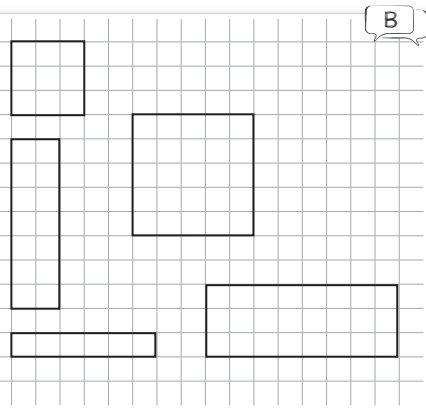
The first order is for a window with 3 rows and 3 columns. Demonstrate how to draw a box around 3 rows and 3 columns of squares, as shown. **How many squares of glass are in this window?** 9. Write 9 in the chart.

Order (Rows x Columns)	Total Squares
3×3	9



Repeat with the other window orders.

Order (Rows x Columns)	Total Squares
3×3	9
7×2	14
1×6	6
5×5	25
3×8	24



This activity previews finding area. Your child will study area in Unit 9.

Independent Practice and Review

Have your child complete the Lesson 2.2 Practice and Review pages.

Lesson 2.3

$\times 2$ Facts

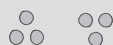
Purpose	Materials
<ul style="list-style-type: none"> Review doubling numbers Introduce $\times 2$ facts Multiply in any order to find $\times 2$ facts 	<ul style="list-style-type: none"> Dot array and L-cover (Blackline Master 5) Paper Playing cards Counters
Memory Work	<ul style="list-style-type: none"> How many minutes equal a half-hour? 30. How many minutes equal a quarter-hour? 15.

Warm-up: Review Doubling Numbers

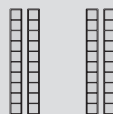
What does it mean to double something? *Sample answer: Make it twice as much.* Have your child double the following numbers:

- Double 3. 6.
- Double 6. 12.
- Double 5. 10.
- Double 8. 16.
- Double 9. 18.
- Double 7. 14.
- Double 10. 20.
- Double 20. 40.
- Double 40. 80.
- Double 50. 100.

If your child has trouble, model the questions with counters or base-ten blocks.



Double 3 is 6.



Double 20 is 40.

Activity (A): Introduce the $\times 2$ Multiplication Facts

The multiplication facts are the multiplication problems from 1×1 up to 10×10 . This year, you'll learn the multiplication facts so that you know them by heart, just like you know the addition and subtraction facts. Today, you'll start learning the $\times 2$ facts.

See the Unit 2 **Teaching Math with Confidence** for more on how *Math with Confidence* approaches mastering the multiplication facts.

Show your child the list of $\times 2$ facts in part A. **This list of multiplication facts is called the "times 2 table."** Show 1×2 on the dot array. **What's 1 times 2?** 2. Write 2 in the blank.

$$1 \times 2 = \boxed{2}$$



Show 2×2 on the dot array. **What's 2 times 2?** 4. Write 4 in the blank.

$$2 \times 2 = \boxed{4}$$



Repeat with the rest of the $\times 2$ facts. Encourage your child to add 2 to each previous answer to find the next answer.

$1 \times 2 =$	<input type="text" value="2"/>	$6 \times 2 =$	<input type="text" value="12"/>
$2 \times 2 =$	<input type="text" value="4"/>	$7 \times 2 =$	<input type="text" value="14"/>
$3 \times 2 =$	<input type="text" value="6"/>	$8 \times 2 =$	<input type="text" value="16"/>
$4 \times 2 =$	<input type="text" value="8"/>	$9 \times 2 =$	<input type="text" value="18"/>
$5 \times 2 =$	<input type="text" value="10"/>	$10 \times 2 =$	<input type="text" value="20"/>

What patterns do you notice? *Sample answers: The answers are the even numbers in order. The answers are the numbers we say when we count by 2s. The answers are doubles.*

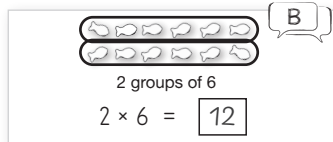
Noticing and discussing patterns in multiplication tables helps children memorize them more easily and quickly. You'll discuss each multiplication table in this way.

Activity (B): Multiply in Any Order to Find $\times 2$ Facts

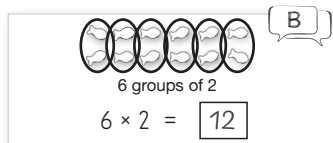
Use a piece of paper to cover the completed $\times 2$ table.

Covering the completed table prevents your child from referring to it during the next activity.

If we think of each row as a group, we have 2 groups of 6. What's 6 plus 6? 12. Point to each group of 2 as you ask: **So, what's 2 times 6? 12.** Write 12 in the blank. **You can also think of 2 times 6 as double 6. Double 6 is 12, so 2 times 6 is 12.**



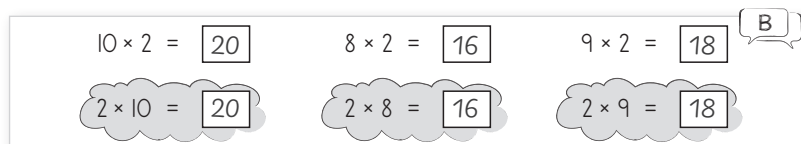
If we think of each column as a group, we have 6 groups of 2. Point to each group of 2 as you ask: **What's 2 plus 2? 4. Plus 2? 6. Plus 2? 8. Plus 2? 10. Plus 2? 12. So, what's 6 times 2? 12.** Write 12 in the blank.



Did the total number of goldfish change when we switched the order of the numbers? No. 6 times 2 and 2 times 6 both have the same total number of goldfish. The two equations just describe the array in two different ways.

We can multiply numbers in any order, just like we can add numbers in any order. This helps find answers to the $\times 2$ facts.

10 times 2 means 10 groups of 2. Adding up 10 groups of 2 would take a while! Instead, let's think of this as 2 groups of 10 and double 10 to find the answer. What's double 10? 20. So, what's 10 times 2? 20. Write 20 in both blanks. Repeat with the other multiplication problems.



Activity (C): Play Multiplication Crash ($\times 2$)

Play Multiplication Crash.

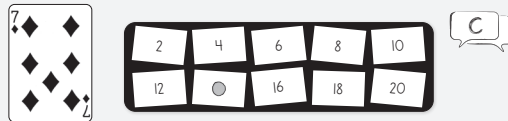
Multiplication Crash ($\times 2$)

Materials: Deck of playing cards with jacks, queens, and kings removed (40 cards total); 10 counters of two different colors each

Object of the Game: Have the most counters on the game board at the end of the game.

Shuffle the cards and place the stack face down on the table. Give 10 counters of one color to one player and 10 counters of a different color to the other player.

On your turn, flip over the top card. Multiply the card by 2, say the matching multiplication fact, and place a counter on the matching square. For example, if you flip over a 7, say “2 times 7 equals 14” and place a counter on 14.



If the other player already has a counter on the square, you may “crash” into their counter, remove it, and place your own counter on the square. Continue until all the squares are filled. Whoever has more counters on the board at the end wins the game.

Learning the multiplication facts by heart requires lots of practice! You’ll find many quick games like this throughout the program to provide short, fun, and targeted multiplication practice sessions.

Independent Practice and Review

Have your child complete the Lesson 2.3 Practice and Review pages.