# Eureka Math

## 3rd Grade
## Module 1
## Lesson 8

At the request of elementary teachers, a team of Bethel & Sumner educators met as a committee to create Eureka slideshow presentations. These presentations are not meant as a script, nor are they required to be used. Please customize as needed. Thank you to the many educators who contributed to this project!

Directions for customizing presentations are available on the next slide.

# Customize this Slideshow
## Reflecting your Teaching Style and Learning Needs of Your Students

- ➤ When the Google Slides presentation is opened, it will look like Screen A.
- ➤ Click on the "pop-out" button in the upper right hand corner to change the view.
- ➤ The view now looks like Screen B.
- ➤ Within Google Slides (not Chrome), choose FILE.
- ➤ Choose MAKE A COPY and rename your presentation.
- ➤ Google Slides will open your renamed presentation.
- ➤ It is now editable & housed in MY DRIVE.
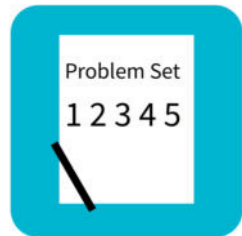
# Icons

RDW — Read, Draw, Write
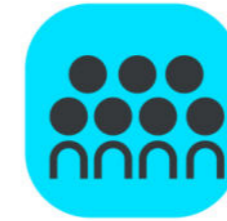
Learning Target

Personal White Board

Problem Set

Manipulatives Needed

Fluency

Think Pair Share

Whole Class

Individual

Partner

Small Group

Small Group Time

# Lesson 8

Objective: Demonstrate the commutativity of multiplication, and practice related facts by skip-counting objects in array models.

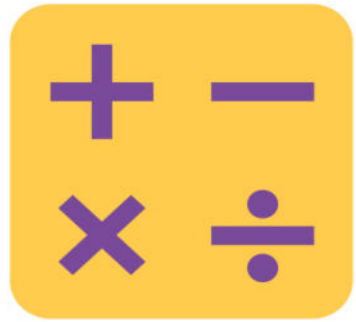## Suggested Lesson Structure

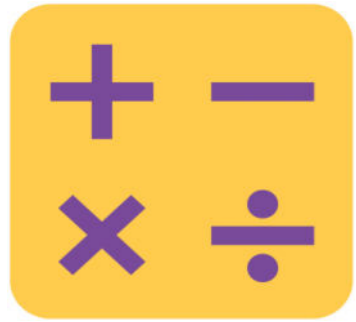| | | |
|---|---|---|
| ■ | Fluency Practice | (6 minutes) |
| ■ | Application Problem | (10 minutes) |
| ■ | Concept Development | (34 minutes) |
| ■ | Student Debrief | (10 minutes) |
| | **Total Time** | **(60 minutes)** |

I can demonstrate the commutativity of Multiplication and practice related facts by skip-counting objects in array models.

# Group Counting

Let's count by twos to 20.

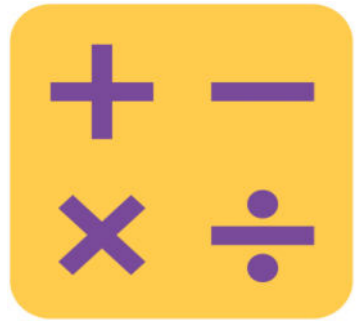**Whisper** the numbers, then **speak** them.

# Group Counting

Let's count by twos to 20 again.

This time, **hum** the first number, and then **speak** it.
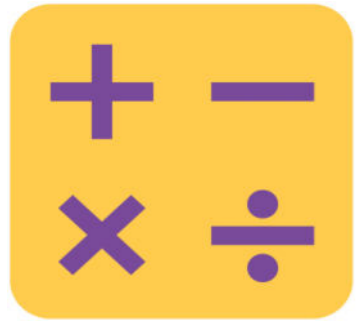
As you hum, think of the number.

# Group Counting

Count by twos to 20 again.

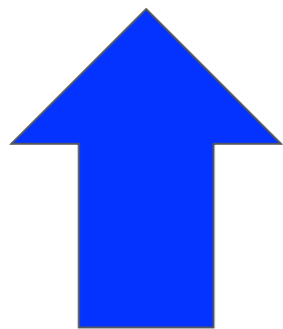This time, instead of **humming,** think of every other number

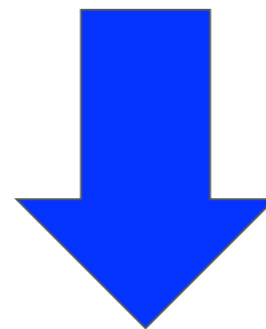What did we just count by?

# 🟨 Group Counting

Let's count by fours.

⬆️ Count up          ⬇️ Count Down
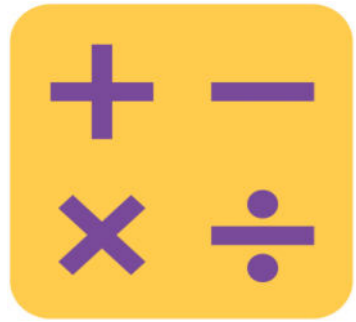
# Group Counting

Let's count by threes.
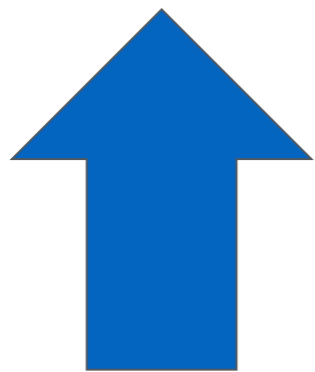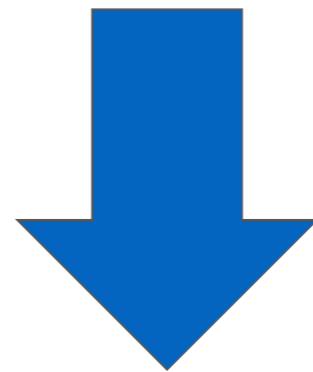
↑ Count up          ↓ Count Down
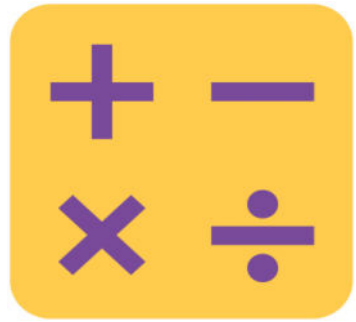
# Commutative Multiplying

How many groups of twos do you see?
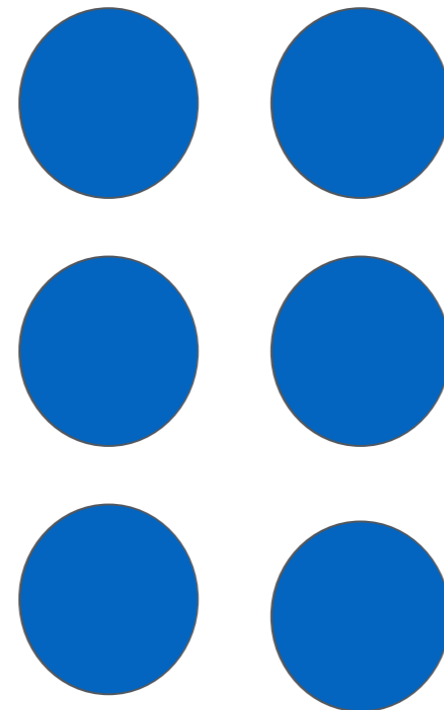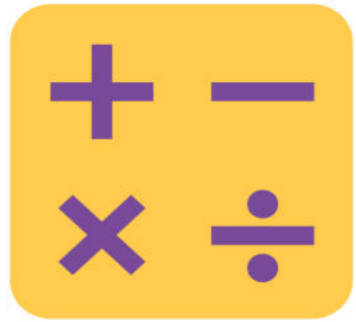
# Commutative Multiplying

Write two different multiplication sentences for the array.
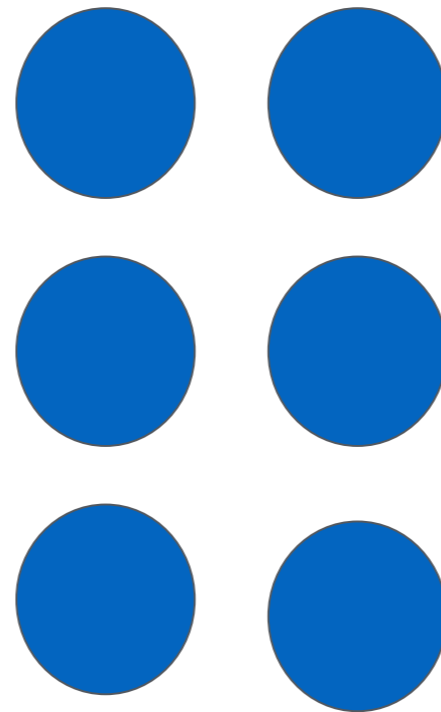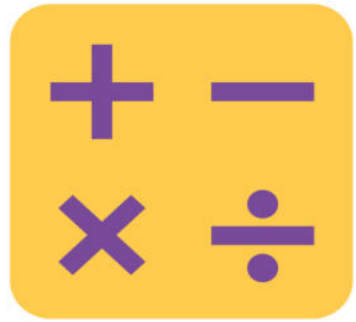
# Commutative Multiplying

How many groups of fives do you see?
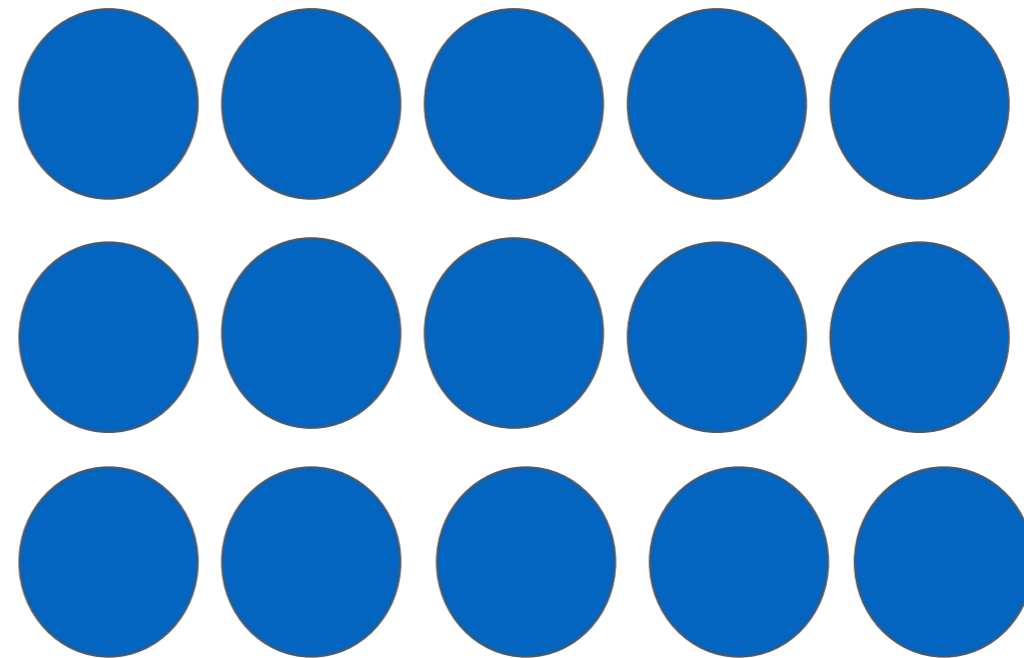
# Commutative Multiplying

Write two different multiplication sentences for the array.
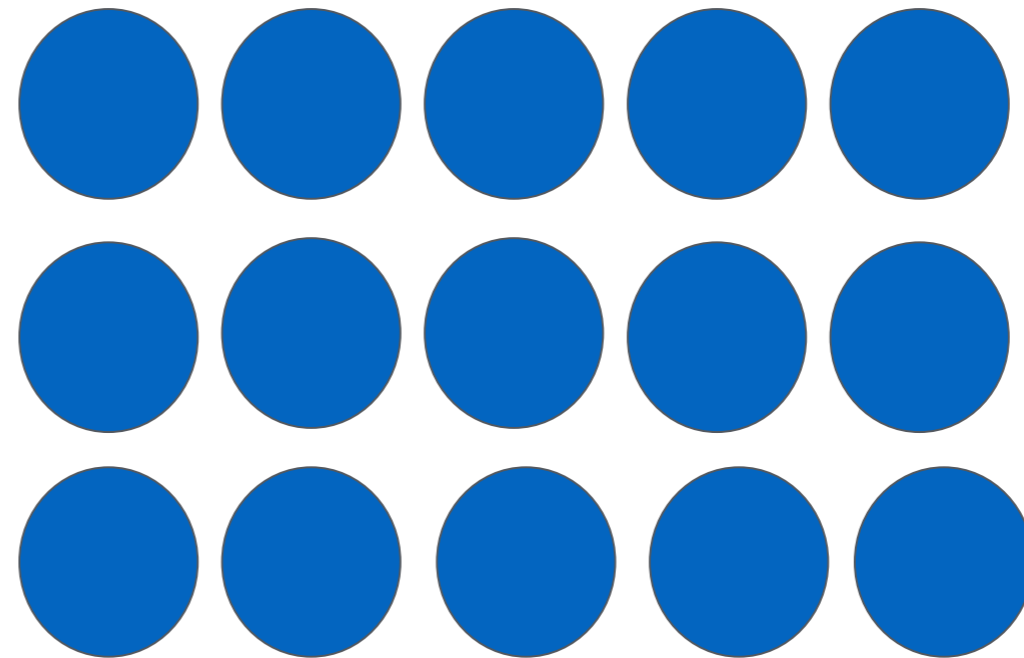
# Commutative Multiplying

4 x 2 = 2 x ___

On your board, fill in the blank.

# Commutative Multiplying

9 x 5 = 5 x ___

On your board, fill in the blank.

# Commutative Multiplying

3 x 6 = 6 x ___

On your board, fill in the blank.

# Application Problem

Children sit in 2 rows of 9 on the carpet for math time.  Erin says, "We make 2 equal groups."  Vittesh says, "We make 9 equal groups."  Who is correct?  Explain how you know using models, numbers, and words.

RDW

# Rotate 90 Degrees

Turn your personal white board so that the long side is vertical.

Skip-count by threes 4 times and write each number.

# Rotate 90 Degrees

Draw an array to match your count where number of rows represents the number of groups.

Discuss how many rows and columns you see.

# Rotate 90 Degrees

Turn your board so that the long side is horizontal. How many rows and columns does it show?

What is the difference between the vertical and horizontal arrays?

# Rotate 90 degrees

Did the total number of dots change?

So, the total and the factors stay the same, but the factors switch places.

Yesterday we learned a special name for that.  It's called...

# Rotate 90 degrees

Use the **commutative property** to write two multiplication sentences for the array.

# Rotate 90 Degrees

Practice with a partner!

Partner A gives skip counting directions.  Partner B writes the count, draws an array, and writes the multiplication sentences.  Then, partners switch roles.

- Skip-count by twos 3 times
- Skip-count by threes 6 times

# Interpreting rows and columns in rotated arrays

Work with your partner to draw an array that shows 5 rows and 3 columns.

# Interpreting rows and columns in rotated arrays

Write an equation to match your array where the first factors represents the number of rows.  Don't solve it yet.

# Interpreting rows and columns in rotated arrays

5 x 3 = ___

I'm going to change the problem slightly. Listen carefully and rotate your array to match: 3 rows and 5 columns.

# Interpreting rows and columns in rotated arrays

Write the equation to the new array.  Let the first factor represent the number of rows.  Don't solve it yet.

# Interpreting rows and columns in rotated arrays

3 x 5 = ___

Explain the difference between these problems to your partner.

# Interpreting rows and columns in rotated arrays

When we rotated our array, we agreed the first factor would tell us the number of rows.  What did that do to the order of factors?

Did the total change?

# Interpreting rows and columns in rotated arrays

When we change the order of the factors, we are using the **commutative property**.

Solve each of your equations by skip-counting. Write each number as you say it.

# Interpreting rows and columns in rotated arrays
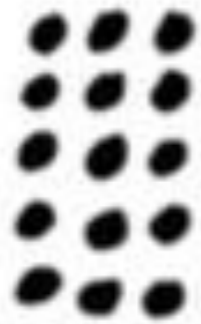
$5 \times 3 =$ ___

↓

the number of rows

3, 6, 9, 12, 15
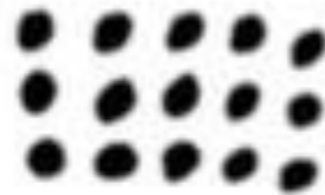
$3 \times 5 =$ ___

↓

the number of rows

5, 10, 15

$5 \times 3 = 3 \times 5$

# Interpreting rows and columns in rotated arrays

Continue with the following possible examples:

- 7 rows and 2 columns
- 3 rows and 9 columns

Are these statements equal?

Use your array to discuss with your partner how you know.
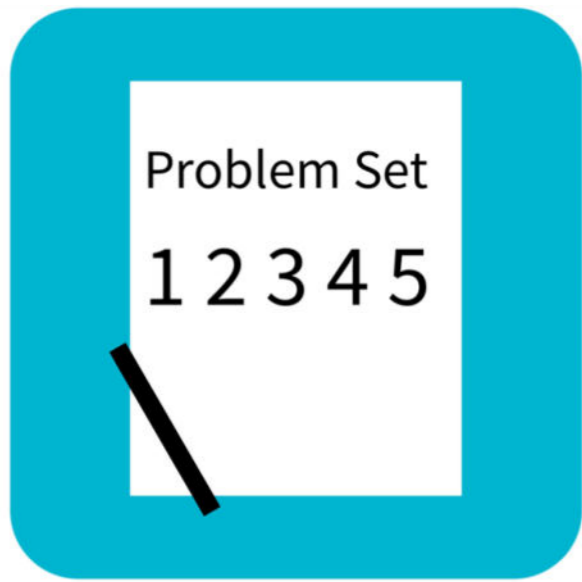
# Problem Set

**Problem Set**
1 2 3 4 5

Name _____          Date _____

1.  Draw an array that shows 5 rows of 3.

2.  Draw an array that shows 3 rows of 5.

3.  Write multiplication expressions for the arrays in Problems 1 and 2.  Let the first factor in each expression represent the number of rows.  Use the commutative property to make sure the equation below is true.

# Debrief

- Share your answers to Problem 7 with a partner. Do your multilications sentences look the same, or are they different?
- Discuss the meaning of the commutative property and how it relates to equal groups,columns, rows and arrays.
- Discuss the usefulness of skip-counting to solve multiplication problems.

# Exit Ticket

Name _____ Date _____

Mary Beth organizes stickers on a page in her sticker book. She arranges them in 3 rows and 4 columns.

a. Draw an array to show Mary Beth's stickers.

b. Use your array to write a multiplication sentence to find Mary Beth's total number of stickers.

c. Label your array to show how you skip-count to solve your multiplication sentence.