

Show Your Math

Choose models and connect them to equations.

GRADES K-12 • MA.K12.MTR.2.1

MA.K12.MTR.2.1 "Demonstrate understanding by representing problems in multiple ways. Mathematicians who demonstrate understanding by representing problems in multiple ways: Build understanding through modeling and using manipulatives..."

NAME _____

DATE _____

ART CLUB BEADS

Day	Beads
Monday	6
Tuesday	9
Wednesday	8

PICK A MODEL

Elementary multiplication focus: pictures, equal groups, tables and equations can represent the same problem. Make a model that fits the context, label what each part means, then explain how its parts connect to the equation.

WORKED EXAMPLE

A game board shows tokens in equal rows. How many tokens are there? Connect the picture to an equation.



1. The 2 rows are 2 groups; each group contains 5 tokens.
2. Each 5 in $5 + 5$ counts one row. The sum is 10.
3. In $2 \times 5 = 10$, 2 is the row count and 5 is the tokens per row.

Answer: 10 tokens; $2 \times 5 = 10$

PRACTICE 4 problems

- 1** Jalen fills 3 bags with 4 cards each. Draw equal groups or an array. Label bags and cards. Write an equation; tell what each factor represents.



ANSWER _____

- 2** A theater has 6 rows of 3 seats. Draw an array. Write repeated addition and multiplication. Explain how one row appears in both expressions.



ANSWER _____

- 3** Lina puts 7 buttons on each of 4 costumes. Would a table of costumes and buttons or a drawing of every button help you track totals as costumes are added? Choose, explain why, and write the equation for 4 costumes.

ANSWER _____

- 4** A coach packs 8 bottles in each of 6 crates. A student writes $6 + 8 = 14$. Explain the mismatch with equal groups and write a matching equation.

ANSWER _____

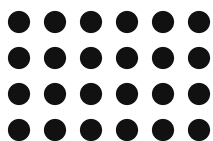
APPLY IT Show your work

- 1** Use the Art Club Beads reference table. Write an addition equation for the total. Explain what each addend and the sum represent in the work space.

WORK SPACE

ANSWER _____

- 2** The seed tray has 4 rows of 6 spaces. Make a DIFFERENT model: draw equal groups or make a table of rows filled and seeds used. Label it, write an equation and explain its connection to the tray.

**ANSWER** _____

CHALLENGE One step up

A robot moves 3 spaces per turn from 0 to Finish. Draw its jumps on the number line. Write repeated addition and multiplication. Explain how the jumps match both equations.



WORK SPACE AND ANSWER

PRACTICE 3

Lina puts 7 buttons on each of 4 costumes. Would a table of costumes and buttons or a drawing of every button help you track totals as costumes are added? Choose, explain why, and write the equation for 4 costumes.

Example: a table organizes the growing totals without drawing every button. $4 \times 7 = 28$ buttons. Accept a justified drawing choice.

PRACTICE 4

A coach packs 8 bottles in each of 6 crates. A student writes $6 + 8 = 14$. Explain the mismatch with equal groups and write a matching equation.

6 counts groups and 8 counts bottles in each group; adding them does not count all bottles. $6 \times 8 = 48$ bottles.

APPLY IT 1

$$6 + 9 + 8 = 23 \text{ beads}$$

6, 9 and 8 are the bead counts for Monday, Tuesday and Wednesday. Their sum 23 counts all three days; the days have unequal counts, so repeated addition of one count would not fit.

CHALLENGE

Four jumps: 0 to 3 to 6 to 9 to 12. $3 + 3 + 3 + 3 = 12$ and $4 \times 3 = 12$; each addend is one jump length, and 4 counts jumps.

Assess the model, equation and connection together. Accept different valid representations and factor orders when students correctly label the groups and group size. A numerical answer alone does not complete a modeling task.

PRACTICE 1

Jalen fills 3 bags with 4 cards each. Draw equal groups or an array. Label bags and cards. Write an equation; tell what each factor represents.

$3 \times 4 = 12$ cards. Show 3 groups of 4: 3 represents bags; 4 represents cards per bag.

**PRACTICE 2**

A theater has 6 rows of 3 seats. Draw an array. Write repeated addition and multiplication. Explain how one row appears in both expressions.

$3 + 3 + 3 + 3 + 3 + 3 = 18$; $6 \times 3 = 18$ seats. Each addend 3 is one row; the 6 counts rows.



APPLY IT 2

$4 \times 6 = 24$ seeds. Example table: rows filled 1, 2, 3, 4; seeds used 6, 12, 18, 24.
Each extra row adds 6 seeds. The table entry for 4 rows is 24 seeds, matching the array and 4×6 . Accept four labeled groups of six instead.

ONE POSSIBLE NEW MODEL

ROWS FILLED	SEEDS USED
1	6
2	12
3	18
4	24