

# TABLE OF CONTENTS

**About Finish Line PA Core Math** ..... **5**

## **UNIT 1: Big Ideas from Grade 2** ..... **7**

LESSON 1 CC.2.1.2.B.3 **Adding Two- and Three-Digit Numbers**  
[connects to CC.2.1.3.B.1] ..... **8**

LESSON 2 CC.2.1.2.B.3 **Subtracting Two- and Three-Digit Numbers**  
[connects to CC.2.1.3.B.1] ..... **15**

LESSON 3 CC.2.4.2.A.1 **Measuring Length** [connects to CC.2.4.3.A.4] ..... **23**

LESSON 4 CC.2.3.2.A.1 **Polygons** [connects to CC.2.3.3.A.1] ..... **29**

**UNIT 1 REVIEW** ..... **36**

## **UNIT 2: Operations and Algebraic Thinking, Part 1** ..... **42**

LESSON 5 CC.2.2.3.A.1 **Understanding Multiplication** ..... **43**

LESSON 6 CC.2.2.3.A.2 **Properties of Multiplication** ..... **50**

LESSON 7 CC.2.2.3.A.1 **Understanding Division** ..... **57**

LESSON 8 CC.2.2.3.A.2 **Connecting Multiplication and Division** ..... **64**

LESSON 9 CC.2.2.3.A.1, 2 **Multiplication Facts** ..... **70**

LESSON 10 CC.2.2.3.A.1, 2 **Division Facts** ..... **77**

LESSON 11 CC.2.2.3.A.4 **Patterns** ..... **83**

**UNIT 2 REVIEW** ..... **90**

## **UNIT 3: Number and Operations in Base Ten** ..... **95**

LESSON 12 CC.2.1.3.B.1 **Rounding Whole Numbers** ..... **96**

LESSON 13 CC.2.1.3.B.1 **Ordering Whole Numbers** ..... **103**

LESSON 14 CC.2.1.3.B.1 **Adding Whole Numbers** ..... **111**

LESSON 15 CC.2.1.3.B.1 **Subtracting Whole Numbers** ..... **118**

LESSON 16 CC.2.1.3.B.1 **Multiplying by Multiples of Ten** ..... **125**

**UNIT 3 REVIEW** ..... **131**

<b>UNIT 4: Operations and Algebraic Thinking, Part 2</b>			<b>135</b>
LESSON 17	CC.2.2.3.A.4	<b>Number Sentences</b>	<b>136</b>
LESSON 18	CC.2.2.3.A.1	<b>One-Step Word Problems with Multiplication and Division</b>	<b>143</b>
LESSON 19	CC.2.2.3.A.4	<b>Two-Step Word Problems</b>	<b>150</b>
<b>UNIT 4 REVIEW</b>			<b>158</b>
<b>UNIT 5: Number and Operations—Fractions</b>			<b>162</b>
LESSON 20	CC.2.1.3.C.1	<b>Understanding Fractions</b>	<b>163</b>
LESSON 21	CC.2.1.3.C.1	<b>Fractions on a Number Line</b>	<b>169</b>
LESSON 22	CC.2.1.3.C.1	<b>Equivalent Fractions</b>	<b>175</b>
LESSON 23	CC.2.1.3.C.1	<b>Comparing Fractions</b>	<b>181</b>
<b>UNIT 5 REVIEW</b>			<b>187</b>
<b>UNIT 6: Measurement and Data</b>			<b>192</b>
LESSON 24	CC.2.4.3.A.2	<b>Time</b>	<b>193</b>
LESSON 25	CC.2.4.3.A.3	<b>Money</b>	<b>201</b>
LESSON 26	CC.2.4.3.A.1	<b>Length</b>	<b>209</b>
LESSON 27	CC.2.4.3.A.1	<b>Liquid Volume</b>	<b>217</b>
LESSON 28	CC.2.4.3.A.1	<b>Weight and Mass</b>	<b>224</b>
LESSON 29	CC.2.4.3.A.4	<b>Pictographs</b>	<b>231</b>
LESSON 30	CC.2.4.3.A.4	<b>Bar Graphs</b>	<b>238</b>
LESSON 31	CC.2.4.3.A.4	<b>Measurement Data on Line Plots</b>	<b>247</b>
LESSON 32	CC.2.4.3.A.5	<b>Understanding Area</b>	<b>255</b>
LESSON 33	CC.2.4.3.A.5	<b>Multiplying to Find Area</b>	<b>261</b>
LESSON 34	CC.2.4.3.A.6	<b>Perimeter and Area</b>	<b>268</b>
<b>UNIT 6 REVIEW</b>			<b>276</b>
<b>UNIT 7: Geometry</b>			<b>284</b>
LESSON 35	CC.2.3.3.A.1	<b>Plane Figures and Polygons</b>	<b>285</b>
LESSON 36	CC.2.3.3.A.1	<b>Quadrilaterals</b>	<b>292</b>
LESSON 37	CC.2.3.3.A.2	<b>Partitioning Shapes</b>	<b>299</b>
<b>UNIT 7 REVIEW</b>			<b>306</b>
<b>Glossary</b>			<b>311</b>
<b>Flash Cards</b>			<b>321</b>

# 5 Understanding Multiplication

## 1 Introduction

**Multiply** to put together groups of the same size.

Bethany spills the pennies from her piggy bank. How can she use multiplication to count them?



Bethany can arrange the pennies in an **array**. An array has rows with the same number of objects. Bethany has 3 rows of 5 pennies.



Bethany can add 5 pennies 3 times to find the total. This is called **repeated addition**.

$$5 + 5 + 5 = 15$$

Bethany can also multiply.

$$\begin{array}{ccc} 3 \times 5 = 15 \\ \uparrow \quad \uparrow \\ \text{Number of groups} \quad \text{Number in each group} \end{array}$$

**Factors** are the numbers being multiplied. The answer is the **product**.

### Think About It

Eduardo baked rolls for a family party. Each pan had 6 rows of rolls. There were 4 rolls in each row. Explain how the rolls are like an array. How can Eduardo find how many rolls he made?

---

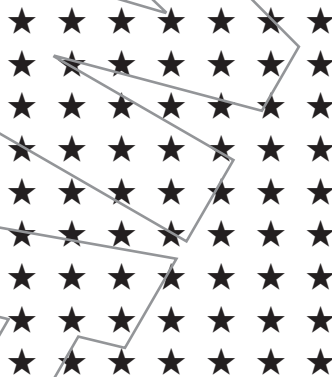
---

---



### Focused Instruction

**Multiplication problems can be described using an array. The number of rows is one factor. The number of shapes in each row is another factor. The total number of shapes is the product.**



Think of each row as a group.

- How many groups are there? \_\_\_\_\_
- How many stars are in each group? \_\_\_\_\_
- What number do you add repeatedly? \_\_\_\_\_
- How many times do you add it? \_\_\_\_\_
- Write the multiplication sentence. \_\_\_\_\_

Think about what the numbers in a word problem mean. Solve this problem using a multiplication sentence.

- Carla picked peaches and put them in a basket. She carried 4 peaches at a time. She stopped when the basket was full. It took her 8 trips to fill the basket. How many peaches did Carla pick?

What are the parts of a multiplication sentence?

\_\_\_\_\_

How many factors are in the multiplication sentence that solves this problem?

\_\_\_\_\_

Describe one of the factors.

\_\_\_\_\_

Describe the other factor.

\_\_\_\_\_

Solve the problem using a multiplication sentence.

\_\_\_\_\_

A factor is a number being multiplied.

Use what you know about multiplication to write multiplication sentences to answer these questions.

- 1 A group of friends went to a picnic in 4 cars. Each car had 5 people in it. How many people went to the picnic?

\_\_\_\_\_

- 2 Tricycles have 3 wheels. How many wheels do 7 tricycles have?

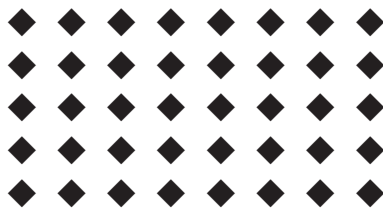
\_\_\_\_\_

- 3 A room has 6 rows of chairs. Each row has 9 chairs. How many chairs are in the room?

\_\_\_\_\_

Solve the following problems.

- 1 Write a multiplication sentence that goes with the array below.



One factor is the number of rows. The other factor is the number of objects in each row.

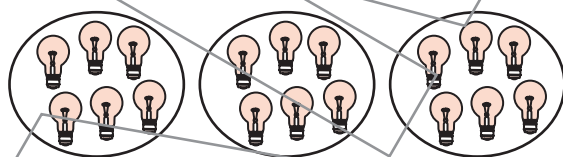
**Answer** \_\_\_\_\_

- 2 Draw an array that models the multiplication sentence:

$$2 \times 5 = 10$$

In a multiplication sentence, the number of groups is written first. In an array, each row is a group.

- 3 Write an addition sentence and related multiplication sentence that represent the drawing below.



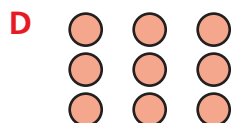
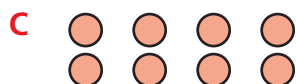
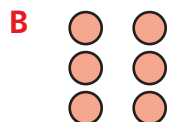
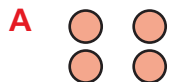
Remember how addition sentences are related to multiplication sentences.

**Addition** \_\_\_\_\_

**Multiplication** \_\_\_\_\_

Solve the following problems.

- 1 Which array models  $3 \times 2 = 6$ ?



- 2 Each of the 4 wheels of a car is held on by 5 bolts. Which multiplication sentence shows the total number of wheel bolts on a car?

A  $4 \times 4 = 20$

B  $5 \times 5 = 20$

C  $4 \times 5 = 20$

D  $4 \times 4 \times 4 \times 4 \times 4 = 20$

- 3 Can you write  $6 + 6 + 6 + 4 = 22$  as a multiplication sentence? Explain.

---

---



**4** Emilio planted 4 rows of tomato plants. Each row had 6 plants.

**Part A** Write the multiplication sentence that shows how many tomato plants Emilio planted. Solve the problem.

**Answer** \_\_\_\_\_

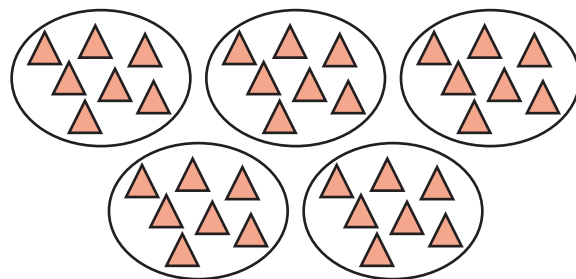
**Part B** Draw the array that shows the multiplication sentence.

**Part C** Draw an array to show another way that Emilio could have arranged the same number of tomato plants other than in a single row.

**5** Look at the drawing at the right. Rama wrote the addition sentence and the multiplication sentence below to put together the equal groups. Is she correct? Explain.

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

$$5 \times 5 = 25$$




---



---



---



- 6 George and Elsa put trays of cookies in the oven to bake. George made 3 rows of cookies with 4 cookies in each row. Elsa made 4 rows of cookies with 3 cookies in each row.

**Part A** In the space below, draw an array to show how George placed the cookies. Then draw an array to show how Elsa placed the cookies.

**Part B** Write a multiplication sentence for each array. Then select an option to complete the sentence below.

**George's Array** \_\_\_\_\_

**Elsa's Array** \_\_\_\_\_

The number of cookies George made was [ less than,  
more than, the same as ] the number of cookies Elsa made.