

#### Vertical Progression:

<b>2<sup>nd</sup> Grade</b>	<p><b>2.OA.C Work with equal groups of objects to gain foundations for multiplication.</b></p> <ul style="list-style-type: none"> <li>○ <b>2.OA.C.3</b> Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.</li> <li>○ <b>2.OA.C.4</b> Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.</li> </ul>
<b>3<sup>rd</sup> Grade</b>	<p><b>3.OA. C Multiply and divide within 100.</b></p> <ul style="list-style-type: none"> <li>○ <b>3.OA.C.7</b> Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that <math>8 \times 5 = 40</math>, one knows <math>40 \div 5 = 8</math>) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</li> </ul>
<b>4<sup>th</sup> Grade</b>	<p><b>4.OA.A Use the four operations with whole numbers to solve problems.</b></p> <ul style="list-style-type: none"> <li>○ <b>4.OA.A.1</b> Interpret a multiplication equation as a comparison, e.g., interpret <math>35 = 5 \times 7</math> as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.</li> <li>○ <b>4.OA.A.2</b> Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.</li> <li>○ <b>4.OA.A.3</b> Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.</li> </ul> <p><b>4.OA.B Gain familiarity with factors and multiples.</b></p> <ul style="list-style-type: none"> <li>○ <b>4.OA.B.4</b> Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.</li> </ul>

#### Students will demonstrate command of the ELG by:

- Multiplying and dividing within 100, with fluency and accuracy, using the relationship between multiplication and division and properties of operations.
- Know from memory all products of two one-digit numbers.

### Vocabulary:

- Associative Property
- Commutative Property
- Distributive Property
- divide
- equation
- factor
- multiply
- operation
- product
- property
- quotient
- strategy

### Sample Instructional/Assessment Tasks:

1) Standard(s): 3.OA.C.7

Source: Read Tennessee

<http://www.readtennessee.org/sites/www/Uploads/Examples/3.OA.C.7final.pdf>

Item Prompt:

Randy has 36 quarters. He puts them in stacks of 4 to count them. How many stacks of quarters does Randy have? Explain how you solved this problem.

Correct Answer: Sample of student work:

Student:

"I could do division."

$$36 \div 4 = ?$$

OR

I could figure out what I have to multiply times 4 to get 36. I know that 4 x 9 is 36, so there are 9 stacks of quarters."

**2) Standard(s):** 3.OA.C.7

**Source:** <https://grade3commoncoremath.wikispaces.hcpss.org/Assessing+3.OA.7>

**Item Prompt:** Multiplication and Division Fact Families

**Materials and Directions:**

1. Fact Family Strips (some provided on next page)
2. Dry erase markers
3. Paper/pencil/dry erase board (writing tool)
4. Create fact family strips that contain four numbers (three numbers in a fact family and one that doesn't belong). Laminate.
5. The student(s) chooses a strip and crosses out the number that doesn't belong in the fact family.
6. Then, the student(s) writes one multiplication and one division equation from the fact family.

**Modifications**

1. Students write all four equations.
2. Students time themselves to see how many fact families they can create in 1 minute.

**Considerations/Observations:**

1. Does the student understand that the three numbers are related?
2. Does the student understand that multiplication is commutative?
3. Does the student understand how multiplication is related to division?
4. Does the student begin division equations with the largest number?

4 32 9 36	56 7 3 8
6 4 5 30	7 2 42 6
18 9 9 2	3 8 24 25
7 28 6 4	9 45 6 54
21 3 7 28	5 40 9 8

**Teacher notes:**

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that  $8 \times 5 = 40$ , one knows  $40 \div 5 = 8$ ) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Students who demonstrate full accomplishment can multiply any two numbers with a product within 100 with ease by picking and using strategies that will get to the answer fairly quickly, can divide whole numbers with a divisor within 100 and with a whole number quotient with ease by picking and using strategies that will get to the answer fairly quickly and/or can instantly recall from memory the product of any two one-digit numbers.

In this task students should be able to apply: the commutative property, making arrays, equal groups and/or repeated addition/subtraction.