

<b>Grade: 3</b> <b>Subject:</b> Mathematics	<b>Unit 7: Multiplication and Division with 0-5, 9, and 10</b>
<b>Big Idea/Rationale</b>	<ul style="list-style-type: none"> <li>• Use three models to introduce students to multiplication and division: repeated groups, arrays, and area. The lessons emphasize the inverse relationship between multiplication and division: division undoes multiplication and vice versa. Through daily in-class and at-home practice and assessment, students will develop fluency with multiplication and division. This unit covers multiplication and divisions with 1,2,3,4,5,9, and 10.</li> </ul>
<b>Enduring Understanding (Mastery Objective)</b>	<p>Students will understand that:</p> <ul style="list-style-type: none"> <li>• Some real-world problems involving joining equal groups or comparison can be solved using multiplication.</li> <li>• Repeated addition involves joining equal groups and is one way to think about multiplication.</li> <li>• An array involves joining equal groups and is one way to think about multiplication.</li> <li>• Two numbers can be multiplied in any order.</li> <li>• Mathematical explanations can be given using words, pictures, numbers, or symbols.</li> <li>• Some real-world problems involving joining or separating equal groups or comparison can be solved using division.</li> <li>• Sharing involves separating equal groups and is one way to think about division.</li> <li>• Information in a problem can often be shown using a picture or diagram and used to understand and solve the problem.</li> </ul>
<b>Essential Questions (Instructional Objective)</b>	<ul style="list-style-type: none"> <li>• How can you find the total number of objects in equal groups?</li> <li>• How can you think of multiplication as repeated addition?</li> <li>• What are arrays and how do they show multiplication?</li> <li>• How can you write a story to describe a multiplication problem?</li> <li>• How do you write a good mathematical explanation?</li> <li>• How can you think of division as sharing?</li> <li>• How can you think of division as repeated subtraction?</li> <li>• How can you solve problems by drawing a picture and writing a number sentence?</li> </ul>
<b>Content (Subject Matter)</b>	<ul style="list-style-type: none"> <li>• Explore patterns in 5s count-bys and multiplications.</li> <li>• Learn important multiplication vocabulary.</li> <li>• Use multiplication to represent repeated groups situations.</li> <li>• Use drawings to help solve word problems involving repeated groups.</li> <li>• Use multiplication to represent array situations.</li> <li>• Use drawings to help solve word problems involving arrays.</li> <li>• Relate division to multiplication.</li> <li>• Represent and solve division word problems.</li> </ul>

- Explore patterns in 2s count-bys and multiplication.
- Interpret a pictograph.
- Explore patterns in 10s count-bys, multiplication, and divisions.
- Explore patterns in 9s multiplications and divisions.
- Learn a strategy for multiplying and dividing with 9s quickly. Practice 2s, 5s, 9s, and 10s multiplications and divisions.
- Explore patterns in 3s count-bys, multiplications, and divisions.
- Learn a strategy for finding count-bys and products for multipliers greater than 5.
- Understand the area model for multiplications.
- Learn a shortcut for solving multiplication problems.
- Recognize and identify multiplication and division word problems.
- Write and solve multiplication and division word problems.
- Explore patterns in 4s multiplication and count-bys.
- Learn a strategy for finding 4s count-bys and solving problems involving 4s.
- Understand the relationships in the fast array.
- Develop multiplication and division strategies.
- Look for patterns in 1s multiplications, count-bys, and divisions.
- Explore multiplications and divisions with zero and learn that divisions by zero are not possible.
- Investigate the Properties of Addition and Multiplication.
- Practice with 2s, 3s, 4s, 5s, 9s, and 10s multiplications and divisions.
- Practice multiplications and divisions for 0s, 1s, 2s, 3s, 4s, 5s, 9s, and 10s. Solve multiplication and division word problems.
- Solve a variety of problems using mathematical concepts and skills.
- Use the mathematical processes of problem solving, connections, reasoning and proof, communication, and representation.

**Skills/ Benchmarks  
(CCSS Standards)**

- **3.OA.A.1:** Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each.
- **3.OA.A.2:** Interpret whole number quotients of whole numbers, e.g., interpret 56 divided by 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or a s a number of shares when 56 objects are portioned into square shares of 8 objects each.
- **3.OA.A.3:** Use multiplication and division within 2100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problems.
- **3.OA.A.4:** Determine the unknown whole number ion a multiplication or division equation relating Three whole numbers.
- **3.OA.B.5:** Apply properties of operations as strategies to multiply and divide.
- **3.OA.B.6:** Understand division as an unknown-factor problem.
- **3.OA.C.7:** 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 number.

- **3.OA.D.9:** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
- **3.NBT.A.2:** Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations and/or the relationship between addition and subtraction.
- **3.NBT.A.3:** Multiply one-digit whole numbers by multiple of 10 in the range 10-90 (e.g.,  $9 \times 80$ ,  $5 \times 60$ ) using strategies based on place value and properties of operations.
- **3.MD.B.3:** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
- **3.MD.C.5.A:** A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.
- **3MD.C.7.A:** Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
- **3MD.C.7.C:** Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths  $a$  and  $b = c$  is the sum of  $a \times b$  and  $a \times c$ . Use area models to represent distributive property in mathematical reasoning.
- **Mathematical Practices**

**Materials and Resources**

- Math Expressions, Student Journals, Manipulatives, Math themed literature, BrainPop, IXL Mathematics