Unit #2: Math- Operations and Algebraic Thinking (Grade 3)

Content Area: **Mathematics**
Course(s): **Math 3**
Time Period: **Marking Period 2**
Length: **November- January**
Status: **Published**

Established Goals/Standards

Please choose the appropriate Goals/Standards from the Standards tab above.

MA.3.OA.A.1	Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.
MA.3.OA.A.2	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.
MA.3.OA.A.3	Use multiplication and division within 100 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 problem.
MA.3.OA.A.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
MA.3.OA.B.5	Apply properties of operations as strategies to multiply and divide.
MA.3.OA.B.6	Understand division as an unknown-factor problem.
MA.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 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
MA.3.OA.D.8	Solve two-step word problems using the four operations. 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.
MA.3.OA.D.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
MA.3.NBT.A.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.
MA.3.MD.C.7c	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 the distributive property in mathematical reasoning.
MA.3.MD.D.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Essential Questions

Please add your Essential Questions by clicking on the Lists tab above.

- How are addition and multiplication related?

- How can an unknown division fact be found by thinking of a related multiplication fact?
- How can unknown multiplication facts be found using known facts?
- How is division related to other operations?
- What are different meanings of division?
- What are different meanings of multiplication?
- What patterns can be used to find certain multiplication facts?

Enduring Understanding

Please add your Enduring Understandings by clicking on the Lists tab above.

- Any division problem can be thought of as a multiplication fact with a missing factor.
- Basic multiplication facts with 3, 4, 6, 7 and 8 as a factor can be found by breaking apart the unknown fact into known facts. The answer to the known facts are added to get the final product.
- Division can be interpreted as sharing and repeated subtraction.
- Repeated subtraction involves separating equal groups and is one way to think about division.
- Some real-word problems involve joining or separating equal groups or comparison can be solved using multiplication. Repeated addition involves joining equal groups and is one way to think about multiplication.
- Some real-world problems involve joining equal groups. Repeated addition is one way to think about multiplication. An array involves joining equal groups and is another way to think about multiplicaiton.
- There are patterns in the products for multiplication facts with factors of 2, 5, 9, 0, 1, and 10

Content

The students will be able to...

- write multiplication number sentences for given equal group situations, using the X symbol
- write multiplication sentences for arrays, use arrays, and the Commutative Property of Multiplication to find products
- write math stories for given multiplicaiton facts
- use objects, words, pictures, numbers, and technology to provide a written explanation reflecting their understanding
- use patters to multiply 2, 5, 9, 0, 1, and 10 as a factor
- use basic multiplication facts and numbers to multiply by multiples of 10
- solve for one problem and use the solution to complete a second problem
- use the Distributive Property to simplify multiplication problems by breaking apart larger arrays that represent multiplication facts into smaller arrays that represent other multiplication facts
- use known facts to find products with 3, 4, 6, 7, and 8 as factors
- multiply three numbers and use the Associative Property of Multiplication
- use known facts and patterns to find products
- use objects, pictures, and multiplicaiton to dinf the number of possible combinaitons of data or objects in a problem
- solve multiple -step problems
- use models to solve division problems involving sharing and recording solutions using division number sentences

- use multiplication tables to find answers to division problems
- solve word problems by writing equations that represent the problem situations
- write and solve number stories involving division
- solve problems by using objects and drawing a picture
- give a multiplicaiton fact, state a related division fact and vice versa
- use patterns and fact families to find quotients for division facts with divisors of 0-10
- use previously learned skills to solve multiple-step problems
- use multiplicaiton and division facts to determine whether both sides of an equation are equal and determine the value of an unknown number in an equation
- solve division problems involving sharing and repeated-subtraction by drawing a picture and writing a number sentence

Vocabulary students will know:

multiplication

factors

product

array

Commutative (Order) Property of Multiplication

multiples

Identity (One) Property of Multipliaction

Zero Property of Multiplication

Distributive Property

Associative (Grouping) Property of Multiplication

division

dividend

divisor

quotient

Resources

Envision Resources

- www.pearsonsuccessnet.com
- textbook
- student online resources
- Daily Common Core Review
- Quick Checks
- Reteaching/Practice
- Math Centers

Unit lesson flipcharts

Online Games from teacher website

The Doorbell Rang, By Pat Hutchins