

Unit 1 Introduction to Multiplication and Area

[KY 3rd grade Math Standards](#)

[Unit 1 framework google link](#)

[3rd grade Math Priority Content & Prerequisite Skills](#)

Unit 1 Title: Introduction to Multiplication and Area		Estimated Time Frame: 37 days
<i>Essential Standards: 3.OA.1, 3.OA.2, 3.OA.3, 3.MD.5, 3.MD.6, Supporting Standards: 3.OA.9, 3.NBT.3</i>		
Big Idea(s) CRA explanations for 3rd grade Unit 1		
<ul style="list-style-type: none"> • Represent multiplication with equal groups, arrays, and equal jumps on a number line.. • Relate skip counting and repeated addition to representations of multiplication and realize multiplication is a more efficient strategy of totaling groups instead of counting individual pieces. • Write, represent and solve an equation for a multiplication situation. • Use division to determine the size of each group when the number of groups is known (partitive, i.e. 12 apples in 3 bags. How many are in each bag?) • Use division to determine the number of groups when the size of each group is known. (measurement, 12 apples with 4 in each bag. How many bags?) Operations and Algebraic Thinking Progressions document 		
Essential Question(s)	Common Preconceptions/Misconceptions:	
<ul style="list-style-type: none"> • What are different meanings of multiplication and division? • How can unknown multiplication facts be found using known multiplication facts? • How do we represent and solve problems involving multiplication and division? • How do we understand properties of multiplication and the relationship between multiplication and division? • How can unknown multiplication facts be found using patterns and properties? • How do we multiply and divide within 100? 	<ul style="list-style-type: none"> -Fluency is different than memorization. The Problem with Key Words -Students often believe that skip counting is the most efficient way to recall facts and will not apply other thinking strategies. -To multiply students must realize groups must be equal as unequal groups can only be added. -When representing multiplication and division on a number line, students may count the hatch marks rather than spaces on the number line. -In arrays, the first factor is the row and the second factor is 	

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<p>What are ways to multiply by multiples of 10?</p>	<p>the column, arrays must be rectangular or square with equal rows and equal columns in order to multiply. -Students often consider multiplication and division to be separate rather than seeing the inverse relationship between the two operations.</p>
<p>Standards for Mathematical Practices (bolded practices are emphasized in this unit) Math Practice Standards Posters</p>	<p>Kentucky Interdisciplinary Literacy Practices (KILP)</p>
<p>MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics. MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning.</p>	<ol style="list-style-type: none"> 1. Recognize that text is anything that communicates a message. 2. Employ, develop, and refine schema to understand and create text. 3. View literacy experiences as transactional, interdisciplinary and transformational. 4. Utilize receptive and expressive language arts to better understand self, others, and the world. 5. Apply strategic practices, with scaffolding and then independently, to approach new literacy tasks. 6. Collaborate with others to create new meaning. 7. Utilize digital resources to learn and share with others. 8. Engage in specialized, discipline specific literacy practices. 9. Apply high level cognitive processes to think deeply and critically about text. 10. Develop a literacy identity that promotes lifelong learning.

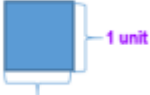
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Essential Standards: KAS Content Standards CRA explanations for 3rd grade Unit 1	Prerequisite Skills & Essential Vocabulary	Sample Learning Intentions* & Sample Success Criteria*
<p>KY.3.OA.1 Interpret and demonstrate products of whole numbers. MP.2, MP.5</p> <p>Students use models for multiplication situations. For example, students interpret 5×7 as the total number of objects in 5 groups of 7 objects each. Coherence $KY.2.OA.4 \rightarrow KY.3.OA.1 \rightarrow KY.4.OA.1$</p>	<p>-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.</p> <p>skip counting repeated addition equal groups multiplication factors product array row column number line</p>	<p>I am learning to represent and solve multiplication with repeated addition, equal groups, arrays, and as equal jumps on a number line so...</p> <ul style="list-style-type: none"> • I can use repeated addition to show the relationship between multiplication and addition with equal groups. • I can use arrays to show and solve multiplication problems. • I can use a number line to represent and solve multiplication facts.
<p>KY.3.OA.2 Interpret and demonstrate whole-number quotients of whole numbers, where objects are partitioned into equal shares. MP.2, MP.5</p>	<p>division operation quotient fact family</p>	<p>I am learning to use division to determine how many objects are in each group so that the groups are equal when the total</p>


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<p>Students use models for division situations. For example, students interpret $56 \div 8$ as the number of 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. Coherence KY.3.OA.1→KY.3.OA.2→KY.5.NF.3</p>	<p>related facts</p>	<p>number and the number of groups is known (partition – fair shares) or how many equal groups can be made if the total number and number of objects in each group is known (measurement – repeated subtraction) so...</p> <ul style="list-style-type: none"> • I can represent division using objects, pictures, or models to show how to divide into equal groups. • I can use repeated subtraction to determine the number of objects in each group in division problems.
<p>KY.3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays and measurement quantities, by using drawings and equations with a symbol for the unknown number to represent the problem. MP.1, MP.4</p> <p>Students flexibly model or represent multiplication and division situations or context problems (involving products and quotients up to 100). Note: Drawings need not show detail, but accurately represent the quantities involved in</p>	<p>strategy unknown equation number sentence mental computation reasonableness</p>	<p>I am learning to solve problems with multiplication and division using various strategies with drawings and equations with a symbol for the unknown number to represent the problem so...</p> <ul style="list-style-type: none"> • I can use drawings, arrays and equations to show and solve multiplication problems.

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<p>the task. See Table 2 in Appendix A. Coherence KY.3.OA.3→KY.4.OA.</p>		<ul style="list-style-type: none"> I can use patterns and related facts to solve multiplication and division problems
<p>Attending to the Standards for Mathematical Practice 3.OA Students recognize the numbers and symbols in an equation such as $5 \times 8 = 40$ are related to a context using groups or arrays (MP.2). For example, a student analyzes this equation and tells a story about walking 8 blocks round-trip to and from school each day, connecting to the equation by saying: 5 days \times 8 blocks each day is 40 total blocks walked. To represent the problem, they show 5 jumps of 8 on an open number line or show five 8-unit long Cuisenaire Rods (MP.5). When reading story situations, students seek to make sense of the story and its quantities (MP.1). They do not just lift numbers out or use keywords. To help make sense of the problem, students decide to write an equation or use a number line. In other words they ‘mathematize’ the situation (MP.4). In missing value problems, students attend to what value is unknown and what operation is represented (MP. 6) and use this information to determine what value will result in both sides of the equations being equal (MP.7).</p>		
<p>KY.3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement. MP.5</p> <p>A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area and can be used</p> <div data-bbox="485 1065 680 1243" style="text-align: center;"> <p>1 square unit = 1 tile</p>  <p>1 unit</p> </div> <p>to measure area. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.</p>	<p>area unit square square unit estimate</p>	<p>I am learning to understand that area is the amount of square units that can cover a flat figure without any spaces so...</p> <ul style="list-style-type: none"> I can recognize area as the number of squares that cover a figure.

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 <p>Coherence KY.3.MD.5→KY.5.MD.3</p>		
<p>KY.3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft. and improvised units). MP.5, MP.6</p> <p>Students use grid paper of varying square units to count the number of unit squares in a figure. Coherence KY.2.G.2→KY.3.MD.6→KY.5.MD.4</p>	<p>-Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.</p>	<p>I am learning to measure area by counting the number of squares that cover a flat figure so...</p> <ul style="list-style-type: none"> • I can count unit squares to find the area of a shape. • I can measure the area of a shape using standard units.
<p>Attending to the Standards for Mathematical Practice 3.MD.5-6</p> <p>Students use 1 inch color tiles to cover a rectangle, understanding that color tile as a square inch (MP.5). As students place the tiles in repeated rows to fill the rectangle, they notice each row has the same number of tiles and the number of tiles that will fill a rectangle can be written as [number of tiles in one row] x [number of rows] (MP.8). They solve story problems that sometimes have the area as the unknown and sometimes have the number of rows or columns as the unknown and use their knowledge of area to solve the problem (MP.1).</p>		
<p>Supporting Standards</p>		
<p>KY.3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range of 10–90 using strategies based on place value and properties of operations. MP.7, MP.8</p>	<p>-Understand that the three digits of a three-digit number represent amounts of hundreds, tens</p>	<p>I am learning to multiply one-digit whole numbers by multiples of ten based on place value and properties of</p>

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<p>To solve 8×60, students interpret this as 8 groups of 6 tens, which is 480. KY.3.OA.5 Coherence KY.2.NBT.1→KY.3.NBT.3→ KY.4.NBT.5</p>	<p>and ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). multiples</p>	<p>operations so...</p> <ul style="list-style-type: none"> I can multiply one-digit whole numbers by multiples of 10.
<p>KY.3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. MP.3, MP.8 <i>(not an essential standard)</i></p> <p>Students observe 4 times a number is always even and explain why 4 times a number can be decomposed into two equal addends. Coherence KY.2.OA.3→KY.3.OA.9→ KY.4.OA.5</p>	<p>-Determine whether a group of objects (up to 20) has an odd or even number of members; write an equation to express an even number as a sum of two equal addends. even number odd number pattern</p>	<p>I am learning to identify patterns and explain them using the properties of operations so...</p> <ul style="list-style-type: none"> I can find and explain patterns for even and odd numbers. I can use structure and properties to explain patterns for multiplication facts.
<p>*Disclaimer: Success Criteria is the evidence students must produce to demonstrate learning. These examples are not comprehensive.</p>		

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Practice Standards and Number Sense Resources:	
<p>Mathematics Practice Standards, Games and Routines <i>(Introduce the Math Practice Standards and routines during the <u>first week of school</u> and use throughout the year) (approximately one week)</i></p> <p>Math Practices & Problem Solving Handbook (in student book -videos available on Savvas platform)</p> <p>Problem Solving Organizer The Problem with Key Words Numberless Word Problem Example Three Reads Strategy</p> <p>3rd grade number sense routines slides (VA) <i>(Use number routines 5-10 minutes daily all year in addition to math class time - Introduce during the first days of school.)</i></p> <p>Math Routines & Resources Sample Daily Math Routines -Additional: Number Routines used 5-10 minutes daily all year (MD) 51 Esti-Mysteries Splat</p>	<p>1st Semester Take-Home Games -TheresaWills Games -EnVisionMathGames -Investigations Math Games -Investigations Math Words and Ideas 3rd grade additional practice Word Wall Cards -KDE Family Math Games -3rd grade HomeLetters -1st Semester Teaching Tools (listed for each Topic below)</p> <p>3rd grade Math FCPS Google Site of Resources</p> <p>Great problem based tasks and videos to start the year: -Practice Standards Tasks to Start the Year from Howard County/youcubed to build growth mindset example video: Brains Grow and Change example Task: Nickel Patterns 1-100 Task to Teach Group Work in Math: Directions or Teachers NameTentFeedback to Connect with students to start school</p>
Anchor Resources by enVision Topic	Supplemental Resources by Standard
<p>enVision Topic 1 – Understand Multiplication and Division of Whole Numbers Review 2nd grade skip counting and arrays 3.OA.1 3.OA.2 3.OA.3 3.OA.5 <i>(approximately two weeks)</i></p> <p>Use Hands-On or Online Manipulatives: Two color counters, Color tiles, Cubes Teaching Tools: Counter sheet 9, Color Tile sheet 8, Number lines 7, Grid Paper 13 -14 -Topic 1 Review What You Know Prerequisite Skills</p>	<p>-Multiplication Sample Anchor Charts GA Multiplication and Division Unit</p> <p>3.OA.1 Relate Addition and Multiplication Equal Groups Volleyball Players</p> <p>3.OA.2 Identify the Unknown Fish Tanks</p> <p>3.OA.3 Literature Link: The Doorbell Rang Markers in Boxes Two Interpretations of Division **Graham Fletchers Conceptual Multiplication Cards</p>

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<p><u>-Topic 1 Vocabulary Cards</u> **Fruit & Nuts 3 Act Math Task **<u>Multiplication - KDE Card Sort Lesson Version 1</u></p>	<p>Graham Fletchers Multiplication Subitizing Cards</p>
<p>enVision Topic 2 - Multiplication Facts: Use Patterns 3.OA.1 3.OA.3 3.OA.5 3.OA.9 (approximately two weeks)</p> <p>Use Hands-On or Online Manipulatives: Two color counters, Color tiles, Cubes TeachingTools: Counter sheet 9, ColorTile sheet 8, Number lines 7, Grid 13 14, 100Chart 10</p> <p><u>-Topic 2 Review What You Know Prerequisite Skills</u> <u>-Topic 2 & 3 Vocabulary Cards</u></p>	<p>MathLearningCenter Multiply/Divide Unit Kendall Hunt Illustrative Multiplication and Area Unit 3.OA.3 Analyzing Word Problems Involving Multiplication Classroom Supplies Gifts from Grandma Bulletin Board Pictures Mathigon Multiplication online Practice How Many Rows? How Many in Each Row? Array City 100 Hungry Ants Making Arrays Turn Your Array 100 Hungry Ants Naming Arrays Which Has More? 3.OA.5 Math Literature Link: Each Orange Had 8 Slices</p>
<p>enVision Topic 6 – Connect Area to Multiplication and Addition 3.MD.5 3.MD.6 3.MD.7 Possibly spend extra day to develop concept of area with color tiles (approximately two or three weeks)</p> <p>Use Hands-On or Online Manipulatives: Color tiles, Cubes, Teaching Tools: Color Tile sheet 8, GridPaper 13 -14, Area of Shapes sheet 12</p> <p><u>-Topic 6 Review What You Know Prerequisite Skills</u> <u>-Topic 6 Vocabulary Cards</u> **Find the Area with Color Tiles 3.MD.5 **Piles of Tiles 3 Act Math Task 3.MD.5,6&7</p>	<p>3.MD.5 Square Units Building with Color Tiles Area Perimeter Activity (digital version)& inch grid paper Garden Design Hidden Rug Design The Square How much area is shaded? Counting Shortcut 3.MD.6 Grid Paper Animals Cover Your Notebook Squares on a Geoboard 3.MD.7 Find the Area of a Rectangle Jack's Rectangles Find Areas of Rectilinear Figures Rectangular Robot Introducing the Distributive Property India's Bathroom Tiles Three Hidden Rectangles Tiny House PBL Finding the Area of Polygons 3.MD.6&7 Paper Cut 3 Act Math Task 3.MD.5,6&7</p>
<p>enVision Topic 10 – Multiply by Multiples of 10 3.NBT.3 (approximately one week)</p>	<p>3.NBT.3 Multiply One-Digit Numbers by Multiples of Ten How Many Colored Pencils?</p>

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<p>Hands-On or Online Manipulatives: Base-10 Blocks <i>Teaching Tools: Lines7, Grids13</i> Topic 10 Review What You Know PreRequisite Skills</p>	<p>Desmos four-function calculator</p>
<p>Summative Assessment</p>	
<p>(Common Unit Assessment in ADAM) This unit assessment will focus on conceptual models of multiplication and using properties of multiplication with various representations to solve problems.....</p>	