Grade: 3 **FCPS 2023-2024 Math Unit 4 Framework** Unit 1 Unit 2 Unit 3 Unit 4

Unit 4 Understanding Fractions & Equivalence, Capacity & Mass and 2D Shapes

KY 3rd grade Math Standards | Unit 4 framework google link | 3rd grade Priority Math Content & Prerequisite Skills

Unit 4 Title: Understanding Fractions & Equivalence, Capacity & Mass and 2D Shapes	**Estimated Time Frame: 45 days**
Essential Standards : 3.G.2, 3.NF.1, 2.NF.2, 3.NF.3 Supporting Standards: 3.MD.4, 3.MD.2, 3.G.1	
Big Idea(s) CRA explanations for 3rd grade Unit 4	
In real life, we encounter multiple meanings for fractions. Fractions are used to describe parts of a whole or set, the result of division, as a ratio, as a measure or as an operator. In real life, we estimate and measure weight, capacity, length, mass, time, temperature, and area every day. Fractions Progressions Document Geometry Progressions document Measurement Progressions document	
Essential Question(s)	**Common Preconceptions/Misconceptions:**
• What are different interpretations of fractions? • What are different ways to compare fractions? • How can time, capacity, and mass be measured and found? • How can 2-D shapes be analyzed, and classified?	-Students may try to generalize what they know about whole numbers when comparing fractions and believe that fractions with a larger number in the denominator represent a greater value. -Many students develop a misconception that equal parts must be symmetrical. This misconception is further solidified when teachers teach symmetry in conjunction with fractions and may struggle with the idea that fractional parts are not always congruent as in the pictures of fourths below.  -Many students struggle with the idea that fractions are numbers, that they are quantities that have values. Activities in which

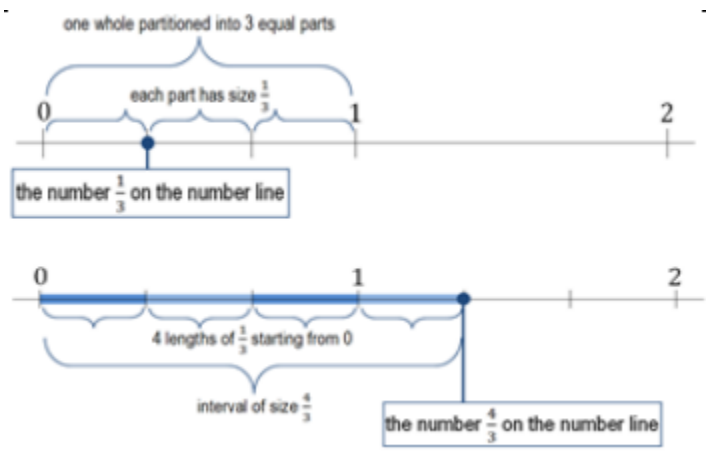
	students are physically splitting an object equally to make fair shares help to develop an understanding of what a fraction is. -Students may struggle with placing fractions on a number line, especially when the number line goes beyond one whole. -When using a ruler, students may struggle with starting at zero instead of the edge of the ruler. Students may also use the incorrect unit if the ruler has both inches and centimeters marked. -Students have a common misconception that changing the orientation of an object changes what shape it is. Students will frequently refer to a rotated square as a diamond. Clarification needs to be ongoing (e.g., a square is a square regardless of its location in space; there is no plane figure called a diamond).
Standards for Mathematical Practice **bolded** practices are emphasized in this unit) *Math Practice Standards Posters*	**Kentucky Interdisciplinary Literacy Practices (KILP)**

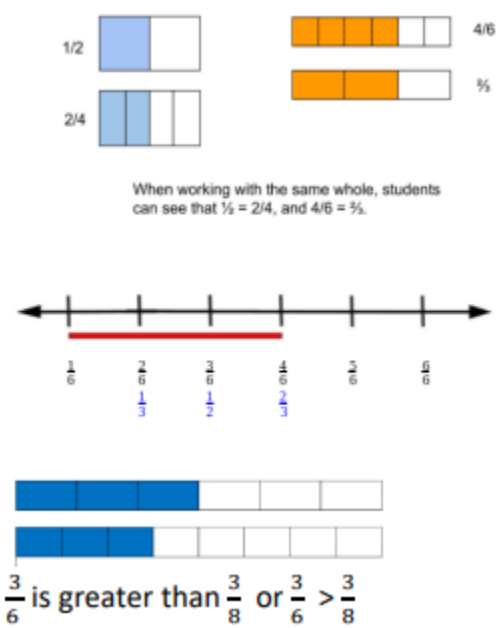
MP.1. Make sense of problems and persevere in solving them. **MP.2. Reason abstractly and quantitatively.** **MP.3. Construct viable arguments and critique the reasoning of others.** **MP.4. Model with mathematics.** **MP.5. Use appropriate tools strategically.** **MP.6. Attend to precision.** **MP.7. Look for and make use of structure.** **MP.8. Look for and express regularity in repeated reasoning.**	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.

Essential Standards: **KAS Content Standards** CRA explanations for 3rd grade Unit 4	**Prerequisite Skills & Essential Vocabulary**	**Sample Learning Intentions* & Sample Success Criteria***

KY.3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. MP.2, M.5 Partitioned parts should be halves, thirds, fourths, sixths, eighths. Students partition a shape into 6 parts with equal areas and describe the area of each part as $\frac{1}{6}$ of the area of the shape. Coherence KY.2.G.3 KY.3.NF.1 →KY.3.G.2	-Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, half of, a third of, etc.; and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape. Fraction Numerator Denominator Unit fraction Whole Partition	I am learning to partition shapes into equal parts so… • I can break apart a whole into equal parts using halves, thirds, fourths, sixths, and eighths. I am learning to identify the unit fraction of a whole so… • I can show and describe part of the whole by identifying and representing the unit fraction.

KY.3.NF.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$. MP.2, MP.7 Students name parts of the whole using fractions and explain the fraction is made up of unit fractions. Students describe the numerator and the denominator using pictures, numbers and words. $\frac{4}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$ Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8. Coherence KY.2.G.3→KY.3.NF.1→ KY.4.NF.3	Fraction Numerator Denominator Unit fraction Partition	I am learning to identify parts of a whole using fractions and explain that the fraction is made up of unit fractions so… • I can create and use models and visuals to identify parts of a whole. • I can describe the numerator using pictures, numbers and words. • I can describe the denominator using pictures, numbers and words. • I can create and use models and visuals to name fractions. • I can show and explain how unit fractions make up a fraction.
KY.3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line. a. Represent a fraction $\frac{1}{b}$ (unit fraction) on a number line by defining the interval from 0 to 1 as the whole and partitioning it into b	-Represent whole numbers as lengths from 0 on a number line with equally spaced points corresponding to the numbers 0, 1, 2, ... and	I am learning to partition a number line from 0 to 1 to represent fractions so… • I can partition a number

equal parts. Recognize each part has size $\frac{1}{b}$. a unit fraction, $\frac{1}{b}$ is located $\frac{1}{b}$ of a whole unit from 0 on the number line. b. Represent a non-unit fraction $\frac{a}{b}$ on a number line by marking off lengths of $\frac{1}{b}$(unit fractions) from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the non-unit fraction $\frac{a}{b}$ on the number line. MP.4  Note: grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6 and 8. Coherence KY.2.MD.6→KY.3.NF.2 →KY.4.NF.3	represent whole-number sums and differences within 100 on a number line. Fractions Unit fraction Interval Partition Non-unit fraction	line into equal parts to show unit fractions (halves, thirds, fourths, sixths, and eighths.) • I can recognize each interval part as • $\frac{1}{b}$ (a unit fraction). • I can represent a unit fraction on a number line. • I can represent a non-unit fraction on a number line.
KY.3.NF.3 Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. **a. Understand two fractions as equivalent (equal) if they are the same size, or same point on a number line.**	Equivalent Numerator	I am learning how to determine if two fractions are equivalent by reasoning about their size so… • I can identify if two

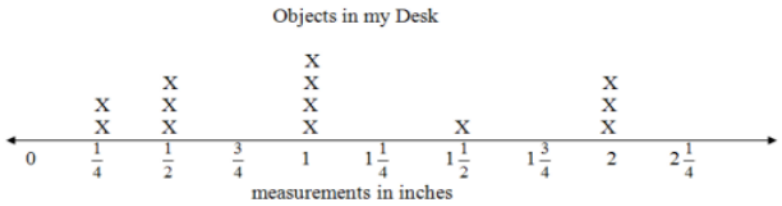
b. Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent through writing or drawing. **c. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers.** **d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions. MP.2, MP.3**  Note: grade 3 expectations in this domain are limited to	Denominator	fractions are equivalent by drawing a picture or using a model. • I can show and explain if two fractions are equivalent by plotting them on a number line. • I can generate equivalent fractions and explain my reasoning. • I can represent whole numbers as a fraction. • I can identify if two fractions are equivalent by comparing their numerators. • I can identify if two fractions are equivalent by comparing their denominators. • I can record the results of fraction comparisons using the symbols >, =, or <, and justify my conclusion.

fractions with denominators 2, 3, 4, 6 and 8. Coherence KY.3.NF.3, KY.4.NF.1 → KY.4.NF.5		

Attending to the Standards for Mathematical Practice 3.NF

Students use the number line to reason about the relative size of a fraction (MP.4). They locate $\frac{5}{6}$ on a number line by accurately partitioning the line into 6 equal-length segments. They explain that $\frac{5}{6}$ means five segments that are each one-sixth of a unit in length, for example counting, "One-sixth, two-sixths, three-sixths, four-sixths, five-sixths." (MP.7). As they partition the line in other ways, they recognize three-sixths is half of the distance to 1 whole, as is $\frac{2}{4}$,$\frac{1}{2}$, and $\frac{4}{8}$, and reason these fractions are equivalent (MP.2). Similarly, they can generate other illustrations or justifications to explain why two fractions are equivalent or not (MP.3).

Supporting Standards:		
KY.3.MD.4 Investigate questions involving numerical data. a. Identify a statistical question focused on numerical data; b. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. c. Show the data by making a dot plot where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters. d. Make observations from the graph about the question posed, including questions about the shape of the data and compare responses. MP.1, MP.3, MP.6 Students measure objects in their desk to the nearest ½ or ¼ of an inch, display data collected on a dot plot and analyze the data.	-Investigate questions involving measurements. a. Identify a statistical question focused on measurements. b. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. c. Show the measurements by making a dot plot, where the horizontal scale is marked off in whole-number units. Data	I am learning to investigate questions and represent the data in a dot plot so… • I can create a question and collect data to display in a graph. • I can use a ruler to measure to the nearest half inch to gather measurement data. • I can represent data by creating a dot plot using whole numbers, halves, or quarters. • I can use graphs to make

 Coherence KY.2.MD.9→KY.3.MD.4→KY.4.MD.4	Dot plot Half inch Fourth of an inch	observations and ask questions about the data.

Attending to the Standards for Mathematical Practice 3.MD

Students understand the purpose of creating a graph is to make sense of data related to a question (MP.1). They look at the data they have collected and decide on how to set up a graph to best communicate the data (MP.6). Students determine if the scale on a dot plot should be in whole numbers, halves or fourths, based on the data gathered. For example, if they measured the length of each person's pencil to the nearest fourth inch, the related dot plot would be created using fourths (MP.6).

KY.3.MD.2 Measure and solve problems involving mass and liquid volume. a. Measure and estimate masses and liquid volumes of objects using standard units of grams (g), kilograms (kg) and liters (L). b. Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. units. MP.1, MP.6 a. Students have multiple opportunities to weigh classroom objects and fill containers to help them develop a basic understanding of the size and weight of a liter, a gram and a kilogram. b. See Table 2 in Appendix A. Coherence KY.2.MD.5→KY.3.MD.2→KY.4.MD.1	Estimate Measure Mass Liquid volume Gram (g) Kilogram (kg) Liter (L)	I am learning to measure and solve problems involving mass and liquid volume so… • I can estimate and measure masses in grams (g) and kilograms (kg). • I can estimate and measure liquid volume in liters (L). • I can use addition, subtraction, multiplication and division to solve one-step word problems involving mass and volume.
Attending to the Standards for Mathematical Practice 3.MD Students solve story situations using a model to support their reasoning (MP.4). For example, a student solves a task such as: you try to run for 15 minutes without stopping. When you look at the clock, the time is 2:52. What time will it say when you have reached 15 minutes? On an open number line, they show a jump from 2:52 to 3:00 as 8 minutes and then jump 7 minutes more to 3:07. Students estimate and then measure objects using standard units. For example, how many grams might balance with a selected item (MP.6)?		
KY.3.G.1 Classify polygons by attributes. a. Recognize and classify polygons based on the number of sides and vertices (triangles, quadrilaterals, pentagons and hexagons).	-Recognize and draw shapes having specified attributes, such as a given number of angles or sides. Identify	I am learning to classify polygons into categories using their attributes so… • I can recognize and

b. Recognize and classify quadrilaterals (rectangles, squares, parallelograms, rhombuses, trapezoids) by side lengths and understanding shapes in different categories may share attributes and the shared attributes can define a larger category. c. Identify shapes that do not belong to a given category or subcategory. MP.6, MP.7 Students describe, analyze and compare properties of two–dimensional shapes. Coherence KY.2.G.1→KY.3.G.1→KY.4.G.2	triangles, quadrilaterals, pentagons, hexagons and cubes (identify number of faces). Classify Category Polygon Attribute Triangles Quadrilateral Pentagon Hexagon Rectangle Square Parallelogram Rhombus Trapezoid Vertices	classify polygons based on numbers of sides and vertices. • I can recognize and classify quadrilaterals by side lengths and angles. • I can explain what different categories of quadrilaterals have in common. • I can explain why a shape may fit into more than one category. • I can identify shapes that do not belong to a given category and explain my reasoning.

Attending to the Standards for Mathematical Practice 3.G.1
Students describe attributes they notice for a particular type of quadrilateral, focusing on side lengths and angles (MP.6). They explain what different types of quadrilaterals have in common and can distinguish between what are defining attributes (such as having four sides) and what are not defining (such as its size or color) (MP.3). Students use a variety of tools and drawings to show fractional parts (MP.5) and they reason if a shape is partitioned into four equal-sized parts (even if they are not the same shape), each part represents one-fourth of the whole shape (MP.2).

*****Disclaimer: Success Criteria is the evidence students must produce to demonstrate learning. These examples are not comprehensive.

Unit 4 Understanding Fractions & Equivalence, Capacity & Mass and 2D Shapes

Practice Standards and Number Sense Resources:	
Mathematics Practice Standards, Games and Routines *(Introduced in the first week and used throughout the year)* -**Math Practices & Problem Solving Handbook** **3rd grade number sense routines slides** (VA) *(use number routines 5-10 minutes daily all year in addition to math class time)* **Math Routines & Resources** Additional: Number Routines used 5-10 minutes daily all year (MD) **51 Esti-Mysteries** **Splat**	***2nd Semester Take-Home Games*** TheresaWills Games EnVisionMathGames *KDE Family Math Games* Investigations Math Words and Ideas Investigations Math Games *3rd grade HomeLetters* **Word Wall Cards** Problem Solving Organizer The Problem with Key Words Numberless Word Problem Examples Three Reads Strategy ***3rd grade additional practice*** ***-2nd Semester Teaching Tools*** **3rd grade Math FCPS Google Site of Resources**
Anchor Resources by enVision Topic	**Supplemental Resources by Standard**
Topic 12 – Understand Fractions as Numbers **3.G.2 3.NF.1 3.NF.2 3.NF.3 3.MD.4** (Review 2nd grade concept of fractions) *(approximately three weeks)* Use Hands-On or Online Manipulatives: **Variety of Fraction Pieces/Strips,** Teaching Tools: Squares & Circles 15, 16-17, Number lines 7, rulers Fractions Anchor Charts Focus on Fractions number routines slides Topic 12 Review What You Know Prerequisite Skills Topics 12, 13 & 14 Vocabulary Cards GA Fractions Unit Kendall Hunt Illustrative Math Fractions	3rd fractions folder 3rd fractions folder 2 **3.G.2:** **Partition a Square** **Partition Shapes** Halves, Thirds and Sixths Folding Fractions with Patty Paper **3.NF.1:** Pattern Block Fractions,digital version Building rectangles (digital version)Fraction Strips Cuisenaire Rods (digital version) **3.NF.2**: **Fractions on a Number Line Match Up** **Fraction Slow Reveal Fractions on a Number Line** **Fraction Matching 1** **Fraction Matching 2** Fractions on a Number Line Closest to ½ Find 1 Find 1/4 Starting from 1 Find 1 Starting from 5/3 Find ⅔ Find 7/4 starting from 1 Locating Fractions Greater than One on the Number Line Locating Fractions Less than One on the Number Line Which is Closer to 1? Partitioning Whole to Equal Shares Concept Card sort slides

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**KDE Lesson - Partitioning the Whole into Equal Shares **Mathigon FractionBars	**3.MD.4** Ruler inch and centimeters for LZ – GeoGebra Measuring Strips Line Plot (Measure items around room & make line plot)
***Topic 13 – Fraction Equivalence and Comparison* 3.NF.3** *(approximately three weeks)* Use Hands-On or Online Manipulatives: **Variety of Fraction Pieces/Fraction Strips,** Teaching Tools: Squares & Circles 15, 16 17, Number line7, ruler Topic 13 Review What You Know Prerequisite Skills ****Fractions on a Number Line - KDE Lesson - Fractions**	Kendall Hunt Illustrative Math Fractions **3.NF.3:** Literature Link: Gator Pie equivalent fractions Equivalent Fractions on a Geoboard Comparing Fractions 1 Comparing Fractions 2 Compare Fractions of a Whole_Halves, thirds, and sixths Representing Fractions on a Number Line Concept FAL Naming the Whole for a Fraction Mathigon FractionBars
Topic 14 – Solve Capacity, and Mass Problems 3.MD.2 *(Lesson 14-4 to 14-7 only) (approximately two weeks)* Use Hands-On or Online Manipulatives: **Variety of Measurement tools and containers,** Teaching Tools: Clock faces 20, Number lines 7 Measurement Sample Anchor Charts Topic 14 Review What You Know Prerequisite Skills **The Orange** (3 Act Task - 3.MD.2	**3.MD.2:** Kendall Hunt Illustrative Math Measurement Benchmark Lengths - Measurement Match benchmark pictures Benchmark Liquid Volume - Measurement Match **Liquid Volume Measurement Sort (digital version)** Measurement picture sort (digital version) Measurement Game GA Measurement Unit
Topic 15 – Attributes of 2-D Shapes 3.G.1 *3.MD.5* *(approximately one week)* *Use Hands-On or Online Manipulatives:* ***Variety of Shapes (pattern blocks, shapes), quadrilaterals*** *TT21, rulers* Geometry Anchor Charts Topic 15 Review What You Know Prerequisite Skills	**3.G.1: Shape Match Geoboard Cards** Name the polygon on the geoboard (digital) **Rectangle Sort** Mathigon Shapes GA Geometry Unit **3rd grade geometry measurement folder**

****Attributes of Shapes - KDE Lesson Geometry**	Kendall Hunt Illustrative Math Geometry Attributes of Shapes Concept Card sort slides

Summative Assessment
(Common Unit Assessment) This unit assessment will focus on conceptual models of fractions to solve problems including fraction equivalence. It will also focus on time problems and attributes of 2D shapes.