Grade 3 Fraction Unit of Instruction

This is a progressive unit of instruction using the Concrete-Representational-Abstract (CRA) Instructional Model. CRA is a three-part instructional model that begins by using concrete materials, then progresses to representational pictures, and finally abstract notation. This unit is not intended to replace your district's curriculum, but rather it serves to support the teaching and learning of the third grade fraction standards. In this unit, students will begin by investigating the standards while using manipulatives to explore the concepts. Then, students will represent their learning through pictures, visuals and drawings. Finally, students will demonstrate their understanding through abstract notation and algorithms. This unit of study will cover the third grade fraction standards MAFS.3.NF.1.1, MAFS.3.NF.1.2 and MAFS.3.NF.1.3.

The unit begins with a list of review lessons and tools to assist in teaching fractions to third grade students. Then, each of the three third grade fraction standards is listed along with aligned instructional resources and formative assessments. The component of CRA is identified for each of the resources and formative assessments. The resources presented in this document may only cover portions of the aligned standard and represent only a small sample of those available on CPALMS.

The Mathematical Practices are habits of mind that describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. The Mathematical Practices should be infused during the course and will be assessed throughout the Grade 3 Mathematics FSA. More information about each Mathematical Practice can be found by clicking on the links below.

MAFS.K12.MP.1.1 Make sense of problems and persevere in solving them.
MAFS.K12.MP.2.1 Reason abstractly and quantitatively.
MAFS.K12.MP.3.1 Construct viable arguments and critique the reasoning of others.
MAFS.K12.MP.4.1 Model with mathematics.
MAFS.K12.MP.5.1 Use appropriate tools strategically.
MAFS.K12.MP.6.1 Attend to precision.
MAFS.K12.MP.7.1 Look for and make use of structure.
MAFS.K12.MP.8.1 Look for and express regularity in repeated reasoning.

Number and Operations- Fractions

A bibliography of children's literature with a focus on fractions is provided. These books can be integrated into the fraction lessons to connect mathematics and literature.	1. *Apple Fractions*, Jerry Pallotta 2. *Fraction Action*, Loreen Leedy 3. *Fraction Fun*, David Adler 4. *Go Fractions*, Judith Stamper 5. *The Hershey's Chocolate Fractions Book,* Jerry Pollata 6. *The Lion's Share*, Matthew McElligott 7. *Pizza Fractions*, Jerry Pollatta 8. *Whole-y Cow!*, Taryn Souders 9. *The Wishing Club*, Donna Jo Napoli 10. *Working with Fractions*, David Adler
3rd Grade Mathematics Course Description	Course descriptions provide an overview for a course and designate which standards are in that course. The course description includes resources for all 39 standards within the 3rd grade mathematics course.
Introduction to Fractions- Review *Lesson Plan* Concrete-Representational-Abstract	This sequence of four lessons is designed to guide young children through an introduction to fractions. Students learn to recognize parts of a whole, divide a whole into equal parts, and represent fractions such as 1/4, 1/3, and 1/2.
Test Item Specifications	The Test Item Specifications indicate the alignment of items with the Florida Standards. Assessment limits are included in the specifications, which define the range of content knowledge in the assessment items for the standard. Sample items for each standard are also included in the specifications document.
Test Design Summary and Blueprint	The Test Design Summary and Blueprint shows the reporting categories with a corresponding weight for the 3rd Grade Mathematics FSA.
Florida Students	Resources specifically designed with students in mind are available on Florida Students. Florida Students is an interactive site that provides educational resources aligned to the Florida Standards.
3rd Grade Mathematics Parent Guide	The parent guide will support parents and families with children in Grade 3 Mathematics.

Instructional Resources

MAFS.3.NF.1.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

Fun with Fractions- 5 Lesson Unit *Lesson Plan* Concrete	In this five lesson unit, students will explore relationships among fractions through work with pattern blocks as concrete representations. This early work with fraction relationships helps students make sense of basic fraction concepts. The lessons in this unit incorporate the use of physical and virtual manipulatives.
Fraction Folding- Part 1 *Lesson Plan* Concrete	In this lesson, students will differentiate examples and non-examples of fractions. They will label unit fractions by manipulating and folding paper.
Fraction Folding- Part 2 *Lesson Plan* Concrete	Students will fold paper to create and name fractions. Students will sing a song to learn the terms numerator and denominator. Students will begin to identify equivalent fractions.
Parts of a Whole *Lesson Plan* Representational-Abstract	In this lesson, students will use models to partition a whole into equal parts and record the associated fractions that represent the part/s. Students will determine and explain whether or not a given fraction and an area representation match.
Fractions *Tutorial* Representational-Abstract	This tutorial for student audiences reviews basic introductory information on fractions. Students will review that a fraction is part of a whole, a fraction is less than 1 whole thing, but more than 0, how to determine pieces of a whole and how to write fractions.
It's All About the Whole *Lesson Plan* Representational-Abstract	Students explore the concept of unit fractions. They make generalizations about unit fractions, and then apply those generalizations when creating a whole from a unit fraction.
Introducing Fractions Slideshow- Flowering Fractions *Virtual Presentation* Representational-Abstract	This online resource is a story involving fractions at the representational and abstract levels. Students interact virtually to solve the fraction story problem.

Fract-o-Bot *Lesson Plan* Representational-Abstract	The students will be able to show a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts. The students will create Fract-O-Bots to meet this concept and learn about fractions.
Naming the Whole for a Fraction *Problem-Solving Task* Representational-Abstract	The students use a visual model to show multiple fractions. The goal of this task is to show that when the whole is not specified, which fraction is being represented is left ambiguous.
Represent and Write Fractions *Lesson Plan* Concrete-Representational-Abstract	Students will demonstrate their understanding of representing and recording fractions using pictures, manipulatives and numbers through an interactive problem solving scenario.

Formative Assessments

Which Shows One Third? Representational	Students are shown three circles and asked to select the one that correctly shows one third shaded and explain why the other two do not.
Painting a Wall Abstract	Students are read a word problem about a wall being painted and asked to describe what three-eighths of the wall means.
Three Quarters of the Race Abstract	Students are read a word problem about a student who has run three-fourths of a race and asked to describe what that means.
What Does One Fifth Mean? Abstract	Students are shown the fraction one fifth and asked to describe what it means.

Instructional Resources

MAFS.3.NF.1.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.

b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

The Fraction String *Lesson Plan* Concrete	Students will create a model of a number line using string and adding machine tape. Students will discover how to partition the string into equal sections and name the fractional pieces, including fractions greater than 1.
Interactive Fraction Number Lines *Lesson Plan* Concrete-Representational	In this lesson students make models of fractions, including a human number line. Students will use the number line to represent and compare fractions less than one.
Fraction Counting Book *Lesson Plan* Representational-Abstract	Students will make a book of fractions in which they choose a denominator and count up to a whole and greater than a whole. They will represent the fractions as pictures, in number form, in word form, and on a number line.
Locating Fractions on the Number Line *Problem-Solving Task* Representational-Abstract	In every part of this task, students must treat the interval from 0 to 1 as a whole, partition the whole into the appropriate number of equal sized parts, and then locate the fraction(s).
Find 1 *Problem-Solving Task* Representational-Abstract	Students will use a unit fraction to find 1 on the number line, a critical aspect for meeting the standard. Part b will help reinforce the notion that when a fraction has a numerator that is larger than the denominator, it has a value greater than 1 on the number line.
Closest to ½ *Problem-Solving Task* Representational-Abstract	Students partition the interval between 0 and 1 into eighths, they will need to recognize that 1/2=4/8. How students tackle the problem and the amount of work they show on the number line can provide insight into the sophistication of their abstract thinking.

The Human Number Line *Lesson Plan* Concrete-Representational-Abstract	This lesson uses a human number line to help students estimate a fraction's approximate position on the number line between zero and one. It also helps students visualize and understand the relative size of fractions, preparing them to be able to make comparisons.

Formative Assessments

Five-Eighths on the Number Line Representational-Abstract	Students are asked to locate five-eighths on a number line that has been anchored by zero and one, but that has not yet been scaled.
Four-Sixths on the Number Line Representational-Abstract	Students are asked to use a number line that includes the location of zero and one-sixth to find the location of four-sixths.
One-Third on the Number Line Representational-Abstract	Students are given four number line diagrams and asked to choose the one that correctly shows the location of one-third.
Three-Fourths on the Number Line Representational-Abstract	Students are asked to scale a number line from zero to one so that they can find the location of three-fourths.

Instructional Resources

MAFS.3.NF.1.3 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 the same point on a number line.
b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.
c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.
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, e.g., by using a visual fraction model.

Discovering Fractions *Lesson Plan* Concrete	In this lesson students will make initial discoveries about fractions. Students will work together to explain and record the discoveries they make while using manipulatives to explore fractions.
Fraction Measuring with Cuisenaire Rods *Lesson Plan* Concrete	In this lesson students will use Cuisenaire rods to measure distances of different lengths. They will also use and compare fractional amounts to find different ways of naming equivalencies.
Match My Fraction *Lesson Plan* Concrete-Representational	The students will use pattern blocks to demonstrate fractions and equivalent fractions. They begin by finding and modeling equivalent fractions with pattern blocks, then they are asked to match cards with pictures to show the equivalent fractions.
Equivalent Fractions: It Means the Same *Lesson Plan* Concrete-Representational	In this lesson, students will use manipulatives and visual models to represent equivalent fractions, including fractions greater than 1. Students will be able to identify representations of equivalence.
Fractions on a Number Line *Lesson Plan* Representational-Abstract	In this lesson, students will have experiences with determining where a given fraction falls in regards to "benchmark" fractions and will practice placing fractions on a number line.

Comparing and Placing Unit Fractions on a Number Line *Lesson Plan* Representational-Abstract	In this lesson, students will discover the value of fractions with a numerator of 1. The students will be able to compare the fractions and be able to correctly place them on a number line.
Cooking with Fractions *Lesson Plan* Concrete-Representational-Abstract	In this lesson, students will examine real-world recipes and determine if the fractions are less than one or greater than one. Students will use manipulatives, visual models, and mathematical notation to represent and compare fractions.
Comparing Fractions with Brownies *Lesson Plan* Concrete-Representational-Abstract	Students will demonstrate their understanding of comparing fractions with the same numerator through engaging problem solving and real-world application. Fraction games and "would you rather have" statements will be used to solidify understanding of comparing fractions with the same numerator.

Formative Assessments

Equivalent Fractions Representational-Abstract	Students determine whether or not fractions are equivalent.
How Many Fourths Are in Two Wholes? Representational-Abstract	Students are asked to divide two rectangles into fourths and then to consider how many fourths the two wholes represent.
The Cake Problem Representational-Abstract	Students compare two fractional parts of two different wholes.
Generating Equivalent Fractions Abstract	Students are given a familiar fraction and asked to generate an equivalent fraction justifying their reasoning.
Comparing Fractions Abstract	Students compare two pairs of fractions and record their comparisons using the less than or greater than symbols.