GRADE 3 MATH UNIT

UNIT 4 – FRACTIONS ON A NUMBER LINE AND AREA

Established Goals:
Standards

Number and Fractions

3. NF.3a: Locate equivalent (equal) fractions on a number line (with denominators 2, 3, 4, 6, 8).

3. NF.3b: Generate and explain equivalent fractions using visual fraction models

3. NF.3c: Generate and explain whole numbers as fractions, and locate them as fractions on a number line.

3.NF.3d: Compare two fractions with the same numerator or the same denominator using the symbols >, =, <.

Measurement and Data

3.MD.5a.b: Find the area of a plane figure understanding that unit squares are used to measure area of a rectilinear drawing.

Operations and Algebraic Thinking

Transfer

Students will be able to:

Understanding the relationship between fractions and whole numbers can help us solve real world problems involving whole and mixed numbers.

Understanding that square units are used to measure the area of a rectilinear drawing.

Strategies in multiplication and division can help us to solve problems involving measurement

Meaning

ENDURING UNDERSTANDING	ESSENTIAL QUESTIONS
• Number Lines, Unit Fractions, Partitioned Shapes, Parts of a Set are several ways to solve problems involving fractions and mixed numbers. • Perimeter and Area are related and there are different strategies and formulas to finding them. (counting square units, adding up the sides, LXW)	• Can we use fraction models and or number lines to help us solve real world problems involving fractions? • How can we apply a variety of mathematical procedures and formulas to finding Area and Perimeter? • How can multiplication and division be used to solve problems involving measurement and fractions?

Acquisition

KNOWLEDGE	SKILLS
Students will know how to…	*Students will be skilled at…*

3.OA.7: Fluently multiply and divide within 50, using the relationship between multiplication and division	• Unit Fractions represent a part of a whole or set • Fractions are parts of a whole or set • Difference between a numerator and denominator • Fractions can be represented on a Number Line • Recognize ¼, ½, ¾ as a quantity in measurement • Perimeter is the total of all sides of a figure • Area is the total amount of space a figure takes up • Area Formula • Perimeter Formula • Multiplication Facts • Know that square units are used to measure area	• Compare fractions with the same denominator. • Use models of fractions and reasoning to compare fractions with the same numerator • Plot fractions on a number line to compare values of fractions. • Use number lines to identify fractions with equivalent values. • Draw pictures and /or partition shapes to show the value of the same fraction in a variety of ways. • Segment fraction bars • Create number lines with whole numbers Subdivide parts of the “whole number” number line or fraction bar into unit fractions • Display a mixed number value on a number line • Compare fractions with the same denominator. • Use models of fractions and reasoning to compare fractions with the same numerator • Discriminate between greater than, less than and equal to sign to compare fractions • Measure the lengths of small items to the nearest ¼ inch and record the information • Determine the Area of a figure by counting square units • Create a figure with a given area using square units • Demonstrate finding perimeter using graph paper and square units for given shapes by counting square units • Calculate the perimeter of a plane shape by measuring the length and width of rectangles and squares. And adding all sidesDetermine the Area of a figure by

		counting square units • Demonstrate the process of finding area of given figures by using the formula multiplying (length X width) or counting square units. • Solve real world problems involving multiplication and division.

Vocabulary	Instruction and Pacing (suggested order to teach)	
Fractions Numerator Denominator Unit Fraction Mixed Number Greater Than Less Than Equal to Organize Square Units Perimeter Side Area Length Width Measure Factor Multiple Product Multiplication Division Divisor Dividend Fact Family Equivalent Fractions Rectilinear drawing	**Equivalent Fractions**	**2 Weeks**
	Compare Fractions using < > and =	**2 Weeks**
	Fractions on a Line Plot and Number Line	**1 Week**
	Measurement – solving for area	**2 Weeks**
	Fluency (Multiplying/Divide within 100)	**Entire Unit**
	Review and Benchmark Testing	**1 Weeks**

Resources

Common Core Standards, New Jersey Model Curriculum

Envisions Math Program Suggested Topics:

Topic 10 Fraction Comparisons & Equivalence

MANIPULATIVES & GRAPHIC ORGANIZERS – Number Lines (unit fractions), Fraction Bars, unifix cubes, graph paper, rulers

http://illuminations.nctm.org, https://www.illustrativemathematics.org

http://pearsonrealize.com http://prodigygame.com

Additional Resources for Area

http://www.njctl.org/courses/math/3rd-grade-math/shapes-and-perimeter/

Area and Perimeter interactive games

http://www.ixl.com/math/grade-3/area-of-figures-made-of-unit-squares

http://www.bgfl.org/custom/resources_ftp/client_ftp/ks2/maths/perimeter_and_area/index.html

http://www.mathplayground.com/area_perimeter.html

Area worksheetshttp://www.commoncoresheets.com/Area.php

NCTM Math Illuminations http://illuminations.nctm.org,

Illustrative Math https://www.illustrativemathematics.org/

Math games http://www2.learningtoday.com/corporate/math-curriculum.asp

Fact Fluency

http://xtramath.org/signin/student

http://www.multiplication.com/

http://njs-main.appspot.com/games-puzzles.html

http://www.coolmath4kids.com/

Additional Resources for ELL Learners

Problem solving worksheet http://media.pearsoncmg.com/curriculum/math/envision2012/pdf/cc4_tt_1.pdf

http://www.franklinboe.org/cms/lib/NJ01000817/Centricity/Domain/2056/Katie%20Bookshelf%20Word%20Problem%20Kids.pdf

Multiplication Units http://www.njctl.org/courses/math/3rd-grade-math/multiplication/

Division Unit http://www.njctl.org/courses/math/3rd-grade-math/division/

Algebra expressions interactive http://www2.learningtoday.com/corporate/files/games/Algebra_Equations_and_Inequalities_L4_V1_T4a.swf

Fraction Units http://www.njctl.org/courses/math/3rd-grade-math/fractions/

https://www.khanacademy.org/math/cc-third-grade-math/cc-3rd-fractions-topic

Fractions http://www.visualfractions.com/

Fraction Games interactives http://www.sheppardsoftware.com/mathgames/menus/fractions.htm

http://interactivesites.weebly.com/fractions.html

Math site for parents and Math from different countries http://www.aaamatematicas.com/

Differentiation and Accommodations
(options) Provide graphic organizers Provide additional examples and opportunities for additional problems for repetition Provide tutoring opportunities Provide retesting opportunities after remediation (up to teacher and district discretion) Teach for mastery not test Teaching concepts in different modalities Adjust pace and homework assignments
ELL Modifications • Demonstrate comprehension of two equivalent fractions by explaining how to locate them on a number line , how to using L1 and/or gestures, examples and selected technical words • Identify and explain whole numbers as fractions on a number line using Teacher Modeling, a word wall and verbal scaffolds (Sentence Starter, Sentence Frame, Cloze Sentences). • Use anchor charts for fractions, area, multiplying and dividing numbers • Illustrated word wall • Use manipulatives- unfix cubes & blocks for area, fractions and to show multiplication & division problems • Use variety of strategies to solve word problems- act out word problems, draw pictures, model • Total physical response- students physically represent fractions and area **ELL scaffolding for Unit 4 3rd** http://www.state.nj.us/education/modelcurriculum/math/ellscaffolding/revised/3u4.pdf

21st Century Skills	Critical Thinking, Creative Thinking, Collaborating, Communicating, and Technology Literacy
Instructional Strategies	Fairfield Township School recognizes the importance of the varying methodologies that may be successfully employed by teachers within the classroom and, as a result, identifies a wide variety of possible instructional strategies that may be used effectively to support student achievement. These may include, but not be limited to, strategies that fall into categories identified by the Framework for Teaching by Charlotte Danielson: • Communicating with students • Using questioning and discussion techniques • Engaging students in learning • Using assessment in instruction • Demonstrating Flexibility and Responsiveness
Interdisciplinary Connections	ELA, Science, and Technology

Common Misconceptions	Proper Conceptions
Segmenting shapes and pictures can show compare fractions	Depending on the size of the drawings, comparing may not be accurate
The larger the denominator the larger the fraction.	A large denominator indicates smaller parts
Fractions are not numbers	Fractions are numbers representing values less than one.
If denominators are even they are equivalent fractions	Equivalent fractions can be found using number lines

Students confuse the greater and less than sign when comparing fractions	The same rules apply with the greater and less than sign when comparing fractions as whole numbers.

Performance Task (optional)

You are the school principal and have decided to provide a bus for any student that lives more than 1 mile away from school. Before you make your final decision you have decided to survey a group of students to get an idea of how many students live more than a mile away. The results are as follows:

Part 1) Create a Line Plot to record the data to help you make the right decision

Part 2) Using your line plot, determine how many students live more than one mile away from school:

Part 3) Using your line plot, determine how may students live less than one mile away from school:

Jamirah – ¾ mile
Koby - 1 mile
Calvin - 1 ½ miles
Kira - ½ mile
Sellina - 1 ¾ miles
Joshua - ½ mile
Ivanna - 1 ½ miles
Sharon - ½ mile
Carlos - 1 ½ miles
Patrick - 1 ¾ miles
Jarod - ¾ miles

Rubric: 1 point for each correct Part

ASSESSMENTS

Suggested Formative Assessment (options)

Problem of the Day

Lesson Quizzes

Exit Ticket

Anecdotal Records (Topic Observation Checklist)

Suggested Summative Assessment - Grade Level developed Unit/Envisions Topic Tests/ Ed Connect Tests/ State Unit Benchmark/Performance Task