

**Mathematics  
Grade 3**

**CURRICULUM GUIDE  
Approved**

**August 22, 2017**

**Mr. David C. Mango, Superintendent  
Mrs. Debra Grigoletti, Director of Curriculum & Instruction**

**Developed by:**

**Veronica Jost  
Brynne O'Neill**

**This curriculum may be modified through varying techniques,  
strategies and materials, as per an individual student's  
Individualized Education Plan (IEP).**

**Approved by the Great Meadow Regional School District Board of Education  
At the regular meeting held on August 22, 2017**

**And**

**Aligned with the New Jersey Student Learning Standards**

## Table of Contents

Component	Page
<b>Philosophy and Rationale:</b>	3-4
<b>Scope and Sequence:</b>	4-12
<b>Mission Statement:</b>	4
<b>Unit: 1</b> Operations and Algebraic Thinking	13-21
<b>Unit 2:</b> Number and Operations in Base Ten	21-27
<b>Unit 3:</b> Number and Operations—Fractions	27-33
<b>Unit 4:</b> Measurement and Data	33-42
<b>Unit 5:</b> Geometry	42-46
<b>NJ Content Standards Link:</b>	47
<b>21<sup>st</sup> Century Skills Link:</b>	47

### **Philosophy and Rationale**

In Grade 3, instructional time should focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area; and (4) describing and analyzing two dimensional shapes.

Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.

Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a fractional part is relative to the size of the whole. For example,  $\frac{1}{2}$  of the paint in a small bucket could be less paint than  $\frac{1}{3}$  of the paint in a larger bucket, but  $\frac{1}{3}$  of a ribbon is longer than  $\frac{1}{5}$  of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than, and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.

Students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to determine the area of a rectangle.

Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

Learning to identify and manipulate numbers, understanding basic operations, manipulating data and information, and building critical thinking and problem solving

skills enables students to identify, understand, and solve real world problems using abstract and quantitative reasoning, existing structures and appropriate tools. Learning to use mathematical skills gives students a range of skills and applications for success throughout their lives.

### **Mission Statement**

The Great Meadows Regional School District will provide quality educational opportunities that ensure the individual success of all students within a safe and supportive environment and to build lifelong learners who will meet society's challenges into an beyond the 21<sup>st</sup> century. To that end, it is anticipated that all students will achieve the New Jersey Student Learning Standards at all grade levels.

### **Scope and Sequence**

<b>Unit: 1</b> Operations and Algebraic Thinking	54 Days
<b>Unit 2:</b> Number and Operations in Base Ten	18 Days
<b>Unit 3:</b> Number and Operations—Fractions	31 Days
<b>Unit 4:</b> Measurement and Data	35 Days
<b>Unit 5:</b> Geometry	13 Days

### **Chapter 1: Addition and Subtraction Within 1,000**

**Domain: (3.OA) Operations and Algebraic Thinking Standards: 8, 9**

**Domain: (3.NBT) Number and Operations in Base Ten Standards: 1, 2**

#### **Lesson Skills and Strategies**

- 1.1 Number Patterns
- 1.2 Round to the Nearest Ten or Hundred
- 1.3 Estimate Sums
- 1.4 Mental Math Strategies for Addition

- 1.5 Use Properties to Add
- 1.6 Use the Break Apart Strategy to Add
- 1.7 Use Place Value to Add
- 1.8 Estimate Differences
- 1.9 Mental Math Strategies for Subtraction
- 1.10 Use Place Value to Subtract
- 1.11 Combine Place Values to Subtract
- 1.12 Problem Solving with Modeling Addition and Subtraction

### **Vocabulary**

- Associative Property of Addition
- Commutative Property of Addition
- compatible numbers
- estimate
- Identity Property of Addition
- pattern
- Even ( review)
- Odd (review)
- round

## **Chapter 2: Represent and Interpret Data**

**Domain: (3.MD) Measurement and Data Standards: 3,4**

### **Lesson Skills and Strategies**

- 2.1 Problem Solving: Organize Data
- 2.2 Use Picture Graphs
- 2.3 Make Picture Graphs
- 2.4 Use Bar Graphs
- 2.5 Make Bar Graphs
- 2.6 Solve Problems Using Data
- 2.7 Use and Make Line Plots

### **Vocabulary**

- bar graph
- frequency table
- horizontal bar graph
- key
- line plot

- picture graph
- scale
- vertical bar graph

### **Chapter 3: Understand Multiplication**

**Domain: Operations and Algebraic Thinking Standards: 1, 3, 5, 8**

#### **Lesson Skills and Strategies**

- 3.1 Count Equal Groups
- 3.2 Relate Addition and Multiplication
- 3.3 Skip Count on a Number Line
- 3.4 Model Multiplication
- 3.5 Model with Arrays
- 3.6 Commutative Property of Multiplication
- 3.7 Multiply with 1 and 0

#### **Vocabulary**

- array
- Commutative Property of Multiplication
- equal groups
- factor
- Identity Property of Multiplication
- multiply
- product
- Zero Property of Multiplication

### **Chapter 4: Multiplication Facts and Strategies**

**Domain: (3.OA) Operations and Algebraic Thinking Standards: 3, 5, 7, 8, 9**

#### **Lesson Skills and Strategies**

- 4.1 Multiply with 2 and 4
- 4.2 Multiply with 5 and 10
- 4.3 Multiply with 3 and 6
- 4.4 Algebra- Distributive Property
- 4.5 Multiply with 7

- 4.6 Algebra: Associative Property of Multiplication
- 4.7 Algebra: Patterns on the Multiplication Table
- 4.8 Multiply with 8
- 4.9 Multiply with 9
- 4.10 Problem Solving: Multiplication

### **Vocabulary**

- Associative Property of Multiplication
- Distributive Property
- multiple
- Commutative Property of Multiplication
- counting number
- Identity Property of Multiplication
- Zero Property of Multiplication

## **Chapter 5: Use Multiplication Facts**

**Domain: (3.OA) Operations and Algebraic Thinking Standards: 4, 9**

**Domain: (3. NBT) Number and Operations in Base 10 Standard: 3**

### **Lesson Skills and Strategies**

- 5.1 Describe Patterns
- 5.2 Find Unknown Numbers
- 5.3 Problem Solving: Use the Distributive Property
- 5.4 Multiplication Strategies with Multiples of 10
- 5.5 Multiply 1- Digit Numbers by Multiples of 10

### **Vocabulary**

- equation
- Distributive Property
- Commutative Property of Multiplication
- multiple
- pattern
- place value

## **Chapter 6: Understand Division**

## **Domain: (3.OA) Operations and Algebraic Thinking Standards: 2, 3, 5, 6, 7**

### **Lesson Skills and Strategies**

- 6.1 Problem Solving: Model Division
- 6.2 Size of Equal Groups
- 6.3 Number of Equal Groups
- 6.4 Model with Bar Models
- 6.5 Algebra: Relate Subtraction and Division
- 6.6 Model with Arrays
- 6.7 Relate Multiplication and Division
- 6.8 Write Related Facts
- 6.9 Division Rules for 1 and 0

### **Vocabulary**

- divide
- divisor
- dividend
- inverse operations
- quotient
- related facts

## **Chapter 7: Division Facts and Strategies**

## **Domain: (3.OA) Operations and Algebraic Thinking Standards: 3, 4, 7, 8**

### **Lesson Skills and Strategies**

- 7.1 Divide by 2
- 7.2 Divide by 10
- 7.3 Divide by 5
- 7.4 Divide by 3
- 7.5 Divide by 4
- 7.6 Divide by 6
- 7.7 Divide by 7
- 7.8 Divide by 8
- 7.9 Divide by 9
- 7.10 Problem Solving: Two-Step Problems
- 7.11 Order of Operations

### **Vocabulary**



- divide
- divisor
- dividend
- factor
- inverse operations
- quotient
- related facts
- order of operations
- product

## **Chapter 8: Understand Fractions**

**Domain: (3. N.O) Number and Operations - Fractions Standards: 1, 2a, 2b, 3c**

### **Lesson Skills and Strategies**

- 8.1 Equal Parts of a Whole
- 8.2 Equal Shares
- 8.3 Unit Fractions of a Whole
- 8.4 Fractions of a Whole
- 8.5 Fractions on a Number Line
- 8.6 Relate Fractions and Whole Numbers
- 8.7 Fractions of a Group
- 8.8 Find Part of a Group Using Unit Fractions
- 8.9 Problem Solving: Find the Whole Group Using Unit Fractions

### **Vocabulary**

- denominator
- eighths
- equal parts
- fourths
- fraction
- fraction greater than 1
- halves
- numerator
- sixths

- thirds
- unit fraction
- whole

## **Chapter 9: Compare Fractions**

**Domain: (3.OA) Number and Operations – Fractions Standards: 3a, 3b, 3d**

### **Lesson Skills and Strategies**

- 9.1 Compare Fractions
- 9.2 Compare Fractions with the Same Denominator
- 9.3 Compare Fractions with the Same Numerator
- 9.4 Compare Fractions
- 9.5 Compare and Order Fractions
- 9.6 Model Equivalent Fractions
- 9.7 Equivalent Fractions
- 

### **Vocabulary**

- less than ( $<$ )
- greater than ( $>$ )
- equal to ( $=$ )
- equivalent
- equivalent fractions

## **Chapter 10: Time, Length, Liquid Volume, and Mass**

**Domain: (3.M.D) Measurement and Data Standards: 1, 2, 4**

### **Lesson Skills and Strategies**

- 10.1 Time to the Minute
- 10.2 A.M and P.M
- 10.3 Measure Time Intervals
- 10.4 Use Time Intervals
- 10.5 Problem Solving: Time Intervals
- 10.6 Measure Length
- 10.7 Estimate and Measure Liquid Volume
- 10.8 Estimate and Measure Mass

- 10.9 Solve Problems About Liquid, Volume, and Mass

### **Vocabulary**

- A.M
- P.M
- gram (g)
- kilogram (kg)
- liter (L)
- elapsed time
- Halves
- liquid volume
- mass
- midnight
- noon
- minute

### **Chapter 11: Perimeter and Area**

**Domain: (3.M.D.) Measurement and Data Standards: 5, 5a, 5b, 6, 7, 7a, 7b, 7c, 7d, 8**

### **Lesson Skills and Strategies**

- 11.1 Model Perimeter
- 11.2 Find Perimeter
- 11.3 Find Unknown Side Lengths
- 11.4 Understand Area
- 11.5 Measure Area
- 11.6 Use Area Models
- 11.7 Problem Solving: Area of Rectangles
- 11.8 Area of Combined Rectangles
- 11.9 Same Perimeter, Different Area
- 11.10 Same Area, Different Perimeters

### **Vocabulary**

- area
- centimeter (cm)
- Distributive Property
- length
- perimeter
- meter (m)
- square unit

- unit square

## **Chapter 12: Two- Dimensional Shapes**

**Domain: (3.G) Geometry Standards: 1, 2**

### **Lesson Skills and Strategies**

- 12.1 Describe Plane Shapes
- 12.2 Describe Angles in Plane Shapes
- 12.3 Identify Polygons
- 12.4 Describe Sides of Polygons
- 12.5 Classify Quadrilaterals
- 12.6 Draw Quadrilaterals
- 12.7 Describe Triangles
- 12.8 Problem Solving: Classify Plane Shapes
- 12.9 Relate Shapes, Fractions, and Area

### **Vocabulary**

- angle
- line segment
- line
- closed shape
- open shape
- plane shape
- point
- polygon
- ray
- right angle
- two-dimensional shapes

### **Stage 1: Desired Results**

**Unit 1 : Operations and Algebraic Thinking**

**Topic :**

## Domain: Operations and Algebraic Thinking – 3.OA

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 100.
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.

### **Content Standards**

- 3.OA.1 Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as  $5 \times 7$ .
- 3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret  $56 \div 8$  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. For example, describe a context in which a number of shares or a number of groups can be expressed as  $56 \div 8$ .
- 3.OA.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.
- 3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations  $8 \times ? = 48$ ,  $5 = \div 3$ ,  $6 \times 6 = ?$ .
- 3.OA.5 Apply properties of operations as strategies to multiply and divide. Examples: If  $6 \times 4 = 24$  is known, then  $4 \times 6 = 24$  is also known. (Commutative property of multiplication.)  $3 \times 5 \times 2$  can be found by  $3 \times 5 = 15$ , then  $15 \times 2 = 30$ , or by  $5 \times 2 = 10$ , then  $3 \times 10 = 30$ . (Associative property of multiplication.) Knowing that  $8 \times 5 = 40$  and  $8 \times 2 = 16$ , one can find  $8 \times 7$  as  $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ . (Distributive property.)
- 3.OA.6 Understand division as an unknown-factor problem. For example, find  $32 \div 8$  by finding the number that makes 32 when multiplied by 8.

- 3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that  $8 \times 5 = 40$ , one knows  $40 \div 5 = 8$ ) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
- 3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations Page 14 of 41 with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
- 3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

### **Essential Questions:**

- How can you use properties to explain patterns on the addition table?
- How can you use the strategy draw a diagram to solve one and two step addition and subtraction problems?
- How can you use equal groups to find how many in all?
- How is multiplication like addition? How is it different?
- How can you use a number line to skip count and find how many in all?
- How can you use the strategy draw a diagram to solve one and two step problems?
- How can you use arrays to model multiplication and find factors?
- How can you use the Commutative Property for Multiplication to find products?
- What happens when you multiply a number by 0 or 1?
- How can you multiply with 2 and 4?
- How can you multiply with 5 and 10?
- What are some ways to multiply with 3 and 6?
- How can you use the Distributive Property to find products?
- What strategies can you use to multiply with 7?
- How can you use the Associative Property of Multiplication to find products?
- How can you use properties to explain patterns on the multiplication table?
- What strategies can you use to multiply with 8?
- What strategies can you use to multiply with 9?
- How can you use the strategy make a table to solve multiplication problems?
- What are some ways you can describe a pattern in a table?

- How can you use an array or a multiplication table to find an unknown factor or product? How can you use the strategy act it out to solve problems with equal groups?
- How can you model a division problem to find how many in each group?
- How can you model a division problem to find how many equal groups?
- How can you use bar models to solve division problems?
- How is division related to subtraction?
- How can you use arrays to solve division problems?
- How can you use multiplication to divide?
- How can you write a set of related multiplication and division facts?
- What are the rules for dividing with 1 and 0?
- What does dividing by 2 mean?
- What strategies can you use to divide by 10?
- What does dividing by 5 mean?
- What strategies can you use to divide by 3?
- What strategies can you use to divide by 4?
- What strategies can you use to divide by 6?
- What strategies can you use to divide by 7?
- What strategies can you use to divide by 8?
- What strategies can you use to divide by 9?
- How can you use the strategy act it out to solve two-step problems?
- Why are there rules such as the order of operations?

### **Enduring Understandings**

- Mathematical operations are used in solving problems in which a new value is produced from one or more values.
- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.

### **Knowledge and Skills (SWBAT embedded course proficiencies)**

- Represent and solve problems involving multiplication and division by
  - Interpreting products in multiplication (e.g.,  $50 = 5 \times 10$  can be interpreted as 5 groups of 10, an array with 5 rows and 10 columns, the area of a 5-by-10 rectangle, 5 rows of 10 objects).
  - Explaining division as a set of objects partitioned into an equal number of shares.
  - Identifying parts of division equations (dividend, divisor, and quotient).
  - Interpreting quotients in division (e.g.,  $50/10 = 5$  can be 5 groups with 10 items in each group or 10 groups with 5 items in each group).

- Determining when to multiply and divide in word problems.
- Representing multiplication and division word problems using drawings, and equations with unknowns in all positions.
- Solving word problems involving equal groups, arrays, and measurement quantities using drawings and equations.
- Determining the unknown number in multiplication and division problems such as in the following examples:  $8 \times 9 = \underline{\quad}$ ,  $8 \times \underline{\quad} = 48$ ,  $\underline{\quad} \times 3 = 27$ ,  $28 \div 7 = \underline{\quad}$ ,  $\underline{\quad} \div 6 = 3$ ,  $35 \div \underline{\quad} = 5$ . Understand properties of multiplication and the relationship between multiplication and division by
- Explaining the commutative, associative, and distributive property of multiplication.
- Applying the commutative, associative, and distributive properties to decompose, regroup, and/or reorder factors to make it easier to multiply two or more factors.
- Explaining how the operation properties can and cannot apply to division and use those properties that can apply to make it easier to find the quotient.
- Explaining the relationship between multiplication and division.
- Turning a division problem into a multiplication problem with an unknown factor.
- Multiply and divide within 100 by
  - Multiplying any two numbers with a product within 100 with ease by picking and using strategies that will get to the answer fairly quickly.
  - Dividing whole numbers with a divisor within 100 and with a whole number quotient with ease by picking and using strategies that will get to the answer fairly quickly.
  - Instantly recalling from memory the product of any two one-digit numbers.
- Solve problems involving the four operations, and identify and explain patterns in arithmetic by
  - Choosing the correct operation to perform the first computation, and choosing the correct operation to perform the second computation in order to solve two-step word problems.
  - Writing equations using a letter for the unknown number.
  - Deciding if my answers are reasonable using mental math and estimation strategies including rounding.
  - Identifying and describing arithmetic patterns in number charts, addition tables, and multiplication tables.
  - Explaining arithmetic patterns using properties of operations.

## **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**



### **Benchmarks (embedded student proficiencies)**

- Grade 3 End of Trimester Assessment

### **Assessment Methods (formative, summative, other evidence and/or student self-assessment)**

- Diagnostic-
  - Show What You Know
  - Digital Personal Math Trainer
  - Interview Assessment
  
- Formative-
  - Lesson Quick Check
  - Mid- Chapter Checkpoint
  - Digital Personal Math Trainer
    - Assessment Animation
    - Assessment Video
  - Standards Practice Pages
  
- Summative Assessment Options:
  - Chapter Review / Test
  - Chapter Test
  - Performance Assessment Task
  - Digital Personal Math Trainer

### **Stage 3: Learning Plan**

#### **Student Engagement**

- Small/whole group discussion
- Making content connections
- Using manipulatives
- Critical Thinking and Problem Solving
- Utilizing Interactive Student Edition and Personal Math Trainer
- Math “On the Spot” Videos
- Written, visual, auditory, and hands-on activities
- Class Participation
- Supplemental worksheets
- Interactive website games
- Project-based learning activities

## **Differentiation**

- Intervene
  - Reteach ( In the chapter resources)
  - ELL Activity
  - Strategic Intervention Guide
  - Intensive Intervention Guide
  - Personal Math Trainer
- On Level
  - Practice and Homework
  - ELL Activity
  - HMH Mega Math
  - iTools
- Enrich
  - Advanced Learners Activity
  - Enrich ( in the chapter resources)
  - Extend the Project
  - ELL Activity
  - HMH Mega Math
  - iTools
- Grab and Go! Differentiated Centers Kit
  - Literature
  - Games
  - Activities
  -

## **Learning Experiences**

- Lessons will follow the 4 E structure
  - Engage
  - Explore
  - Explain
  - Evaluate

## **21st Century skills and Technology**

- Lessons will include:
  - Dynamic Interactivities
  - Instructional Videos
  - Critical Thinking
  - Applying Math Knowledge
  - Real World Connections
  - Problem Solving Activities

- Creativity and Imagination
- Communication and Collaboration with peers
- Media and Technology integrated lessons
- Cross curricular references

**Time Allotment: 54 Days**

**Resources**

- 3.OA.A.1 GoMath! Grade-3
  - Lessons: 3.1-3.2
- 3.OA.A.2 GoMath! Grade-3
  - Lessons: 6.2-6.4
- 3.OA.A.3 GoMath! Grade-3:
  - Lessons: 3.3, 3.5, 4.1-4.3, 6.1, 6.5, 6.6, 7.1, 7.3, 7.8
- 3.OA.A.4 GoMath! Grade-3:
  - Lessons: 5.2, 7.8
- 3.OA.B.5 GoMath! Grade-3:
  - Lessons: 3.6-3.7, 4.4, 4.6, 6.9
- 3.OA.B.6 GoMath! Grade-3:
  - Lessons: 6.7
- 3.OA.C.7 GoMath! Grade-3:
  - Lessons: 4.5, 4.8, 4.9, 6.8, 7.2, 7.4-7.7, 7.9
- 3.OA.D.8 GoMath! Grade-3:
  - Lessons: 1.12, 3.4, 4.10, 7.10, 7.11
- 3.OA.D.9 GoMath! Grade-3:
  - Lessons: 1.1, 4.7, 4.10, 5.1
- Think Central
- Personal Math Trainer
- GoMath! Academy

**Supplemental Resources**

- Number Patterns
  - PBS Kids Cyberchase - Crack Hacker's Safe - Game - <http://pbskids.org/cyberchase/math-games/crack-hackers-safe/>
- Place Value
  - Toon University - Place Value to Thousands - Game - <http://www.toonuniversity.com/flash.asp?err=496&engine=5>
  - Sheppard Software - Place Value Made Easy - Game - <http://www.sheppardsoftware.com/mathgames/placevalue/value.htm>

- IXL- Place value models up to thousands <https://www.ixl.com/math/grade-3/place-value-models-up-to-thousands>
- IXL- Place Value Names up to Thousands <https://www.ixl.com/math/grade-3/place-value-names-up-to-thousands>
- Round a Whole Number
  - Student Tutorial - [http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_popup.shtml&grade=3&chapter=2&lesson=3&title=Round+Two-Digit+and+ThreeDigit+Numbers&tm=tmfd0203e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_popup.shtml&grade=3&chapter=2&lesson=3&title=Round+Two-Digit+and+ThreeDigit+Numbers&tm=tmfd0203e)
  - Mr. Nussbaum - Half-court rounding - Game - <http://www.mrnussbaum.com/rounding/index.html>
- Estimating Sums
  - PBS Kids Cyberchase - Glowa's Estimation Contraption - Game - <http://pbskids.org/cyberchase/math-games/glowlas-estimation-contraption/>
  - IXL- Estimate Sums <https://www.ixl.com/math/grade-3/estimate-sums>
  - IXL Estimate sums up to 1,000 <https://www.ixl.com/math/grade-3/estimate-sums-up-to-1000>
- Properties
  - Education Place - Addition Properties - Student Tutorial - [http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_popup.shtml&grade=3&chapter=4&lesson=1&title=Addition+Properties&tm=tmfd0401e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_popup.shtml&grade=3&chapter=4&lesson=1&title=Addition+Properties&tm=tmfd0401e)
- Addition
  - IXL - Addition: Add two numbers up to three digits - Assessment - <http://www.ixl.com/math/grade-3/add-two-numbers-up-to-three-digits>
  - UEN - "Mental Math: Addition and Subtraction" Lesson - <http://www.uen.org/Lessonplan/preview.cgi?LPid=6093>
- Subtraction
  - IXL Subtract numbers up to three digits <https://www.ixl.com/math/grade-3/subtract-numbers-up-to-three-digits>
- Word Problems
  - Math Playground - Word Problems with Katie - Game - <http://www.mathplayground.com/WordProblemsWithKatie1.html>
  - Math Playground - Thinking Blocks (Bar Model) - Interactive Applet - [http://www.mathplayground.com/NewThinkingBlocks/thinking\\_blocks\\_addition\\_subtraction.html](http://www.mathplayground.com/NewThinkingBlocks/thinking_blocks_addition_subtraction.html) Math Playground -
  - Word Problem Bank - <http://www.mathplayground.com/wpdatabase/wpindex.html>
- Literature
  - Betcha! by Stuart J. Murphy Coyotes

- All Around by Stuart J. Murphy
- Even Steven and Odd Todd by Kathryn Cristaldi
- The Long Wait by Annie Cobb

## **Stage 1: Desired Results**

### **Unit 2**

#### **Topic :** Numbers and Operations in Base Ten

- 3.NBT Use place value understanding and properties of operations to perform multi-digit arithmetic.

#### **Content Standards**

- 3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.
- 3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g.,  $9 \times 80$ ,  $5 \times 60$ ) using strategies based on place value and properties of operations.

#### **Essential Questions:**

- How can you round numbers?
- How can you use compatible numbers and rounding to estimate sums?
- How can you use compatible numbers and rounding to estimate differences?
- What mental math strategies can you use to find differences?
- How can you use place value to subtract 3-digit numbers?
- How can you use the combine place values strategy to subtract 3-digit numbers?
- What mental math strategies can you use to find sums?
- How can you add more than two addends?
- How can you use the break apart strategy to add 3-digit numbers?
- How can you use place value to add 3-digit numbers?
- How can you use a strategy draw a diagram to multiply with multiples of 10?
- What strategies can you use to multiply with multiples of 10?
- How can you model and record multiplying by 1-digit whole numbers multiples of 10?

#### **Enduring Understandings**

- Understanding place value can lead to number sense and efficient strategies for computing with numbers

### **Knowledge and Skills (SWBAT embedded course proficiencies)**

- Use place value understanding and properties of operations to perform multi-digit arithmetic by
  - Rounding whole numbers to the nearest 10.
  - Rounding whole numbers to the nearest 100.
  - Adding within 1000 with ease by using an algorithm or strategy based on place value (collecting the hundreds, collecting the tens, and collecting the ones, and when necessary, composing ten ones to make a ten or composing ten tens to make a hundred).
  - Subtracting within 1000 with ease by using an algorithm or strategy based on place value (subtracting hundreds from hundreds, tens from tens, and ones from ones, and when necessary, decomposing a hundred into ten tens or decomposing a ten into ten ones).
  - Using other strategies (such as applying the commutative or associative property, adding on to solve a subtraction problem) for adding and subtracting within 1000 with ease.
  - Multiplying one-digit numbers by 10.
  - Multiplying one-digit numbers by multiples of 10 using strategies based on place value and operation properties (e.g,  $9 \times 80 = 9 \times (8 \times 10) = (9 \times 8) \times 10$ ; or  $9 \times 80 = (9 \times 50) + (9 \times 30)$ ).

### **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

#### **Benchmarks (embedded student proficiencies)**

- Grade 3 End of Trimester Assessment

#### **Assessment Methods (formative, summative, other evidence and/or student self-assessment)**

- Diagnostic-
  - Show What You Know
  - Digital Personal Math Trainer
  - Interview Assessment
- Formative-
  - Lesson Quick Check
  - Mid- Chapter Checkpoint
  - Digital Personal Math Trainer

- Assessment Animation
    - Assessment Video
  - Standards Practice Pages
- Summative Assessment Options:
  - Chapter Review / Test
  - Chapter Test 1 & 5
  - Performance Assessment Task
  - Digital Personal Math Trainer

### **Stage 3: Learning Plan**

#### **Student Engagement**

- Small/whole group discussion
- Making content connections
- Using manipulatives
- Critical Thinking and Problem Solving
- Utilizing Interactive Student Edition and Personal Math Trainer
- Math “On the Spot” Videos
- Written, visual, auditory, and hands-on activities
- Class Participation
- Supplemental worksheets
- Interactive website games
- Project-based learning activities

#### **Differentiation**

- Intervene
  - Reteach ( In the chapter resources)
  - ELL Activity
  - Strategic Intervention Guide
  - Intensive Intervention Guide
  - Personal Math Trainer
- On Level
  - Practice and Homework
  - ELL Activity
  - HMH Mega Math
  - iTools
- Enrich
  - Advanced Learners Activity

- Enrich ( in the chapter resources)
- Extend the Project
- ELL Activity
- HMH Mega Math
- iTools
- Grab and Go! Differentiated Centers Kit
  - Literature
  - Games
  - Activities
  -

### **Learning Experiences**

- Lessons will follow the 4 E structure
  - Engage
  - Explore
  - Explain
  - Evaluate

### **21st Century skills and Technology**

- Lessons will include:
  - Dynamic Interactivities
  - Instructional Videos
  - Critical Thinking
  - Applying Math Knowledge
  - Real World Connections
  - Problem Solving Activities
  - Creativity and Imagination
  - Communication and Collaboration with peers
  - Media and Technology integrated lessons
  - Cross curricular references

### **Time Allotment: 16 Days**

### **Resources**

- 3.NBT.A.1 GoMath! Grade-3:
  - Lessons: 1.2-1.3, 1.8
- 3.NBT.A.2 GoMath! Grade-3:
  - Lessons: 1.4-1.7, 1.9-1.11
- 3.NBT.A.3 GoMath! Grade-3:
  - Lessons: 5.3-5.5



- Think Central
- Personal Math Trainer
- GoMath! Academy

### **Supplemental Resources**

- Place Value
  - Toon University - Place Value to Thousands - Game - <http://www.toonuniversity.com/flash.asp?err=496&engine=5>
  - Sheppard Software - Place Value Made Easy - Game - <http://www.sheppardsoftware.com/mathgames/placevalue/value.htm>
  - IXL- Place value models up to thousands <https://www.ixl.com/math/grade-3/place-value-models-up-to-thousands>
  - IXL- Place Value Names up to Thousands <https://www.ixl.com/math/grade-3/place-value-names-up-to-thousands>
- Round a Whole Number
  - Student Tutorial - [http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_popup.shtml&grade=3&chapter=2&lesson=3&title=Round+Two-Digit+and+ThreeDigit+Numbers&tm=tmfd0203e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_popup.shtml&grade=3&chapter=2&lesson=3&title=Round+Two-Digit+and+ThreeDigit+Numbers&tm=tmfd0203e)
  - Mr. Nussbaum - Half-court rounding - Game - <http://www.mrnussbaum.com/rounding/index.html>
- Estimating Sums
  - PBS Kids Cyberchase - Glowa's Estimation Contraption - Game - <http://pbskids.org/cyberchase/math-games/glowlas-estimation-contraption/>
  - IXL- Estimate Sums <https://www.ixl.com/math/grade-3/estimate-sums>
  - IXL Estimate sums up to 1,000 <https://www.ixl.com/math/grade-3/estimate-sums-up-to-1000>
- Properties
  - Education Place - Addition Properties - Student Tutorial - [http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_popup.shtml&grade=3&chapter=4&lesson=1&title=Addition+Properties&tm=tmfd0401e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_popup.shtml&grade=3&chapter=4&lesson=1&title=Addition+Properties&tm=tmfd0401e)
- Addition
  - IXL - Addition: Add two numbers up to three digits - Assessment - <http://www.ixl.com/math/grade-3/add-two-numbers-up-to-three-digits>
  - UEN - "Mental Math: Addition and Subtraction" Lesson - <http://www.uen.org/Lessonplan/preview.cgi?LPid=6093>
- Subtraction

- IXL Subtract numbers up to three digits <https://www.ixl.com/math/grade-3/subtract-numbers-up-to-three-digits>
- Word Problems
  - Math Playground - Word Problems with Katie - Game - <http://www.mathplayground.com/WordProblemsWithKatie1.html>
  - Math Playground - Thinking Blocks (Bar Model) - Interactive Applet - [http://www.mathplayground.com/NewThinkingBlocks/thinking\\_blocks\\_addition\\_subtraction.html](http://www.mathplayground.com/NewThinkingBlocks/thinking_blocks_addition_subtraction.html) Math Playground -
  - Word Problem Bank - <http://www.mathplayground.com/wpdatabase/wpindex.html>
- Multiplication
  - Quia - Times 10 Matching [http://www.quia.com/mc/644904.html?AP\\_rand=1404880125](http://www.quia.com/mc/644904.html?AP_rand=1404880125)
  - Math League - Teacher Tutorial <http://www.mathleague.com/help/wholenumbers/wholenumbers.htm>
  - Maths Games - Basic Fact Practice <http://www.maths-games.org/times-tables-games.html>
  - Arcademics Skill Builders - Meteor Multiplication <http://www.arcademicskillbuilders.com/games/meteor/meteor.html>
  - Mr. Nussbaum - Around the World <http://www.mrnussbaum.com/aroundtheworld.htm>
- Literature
  - Betcha! by Stuart J. Murphy Coyotes
  - All Around by Stuart J. Murphy
  - Even Steven and Odd Todd by Kathryn Cristaldi
  - The Long Wait by Annie Cobb
  - A Place for Zero by Angeline Sparagna LoPresti
  - Too Many Kangaroo Things to Do! By Stuart J. Murphy
  - Two Ways to Count to Ten by Ruby Dee
  - What Comes in 2's, 3's, and 4's? by Suzanne Aker

## **Stage 1: Desired Results**

### **Unit 3**

#### **Topic :** Numbers and Operations - Fractions

- 3.NF Develop understanding of fractions as numbers.

### **Content Standards**

- 3.NF.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  $1/b$ .
- 3.NF.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.
- 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 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

### **Essential Questions:**

- What are equal parts of a whole?
- Why do you need to know how to make equal shares?
- What do the top and bottom numbers of a fraction tell?
- How does a fraction name part of a whole?
- How can you represent and locate fractions on a number line?
- When might you use a fraction greater than 1 or a whole number?
- How can a fraction name part of a group?
- How can a fraction tell how many are in part of a group?
- How can you use the strategy draw a diagram to solve fraction problems?
- How can you use the strategy act it out to solve comparison problems?

- How can you compare fractions with the same denominator?
- How can you compare fractions with the same numerator?
- What strategies can you use to compare fractions?
- How can you compare and order fractions?
- How can you use models to find equivalent fractions?
- How can you use models to name equivalent fractions?

### **Enduring Understandings**

- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.

### **Knowledge and Skills (SWBAT embedded course proficiencies)**

- Develop understanding of fractions as numbers by
  - Explaining any unit fraction ( $1/b$ ) as one part of a whole.
  - Explaining any fraction ( $a/b$ ) as “a” (numerator) being the numbers of parts and “b” (denominator) as the total number of equal parts in the whole.
  - Explaining and showing how  $1/b$  can be represented on a number line in two ways: (1) as a number that is located a distance of  $1/b$  to the right of 0, and (2) as the size of each of the parts when a whole is partitioned into  $b$  equal parts.
  - Explaining and showing how  $a/b$  can be represented on a number line in two ways: (1) as a number that is located a distance of  $a/b$  to the right of 0, and (2) as the size of a parts when a whole is partitioned into  $b$  equal parts.
  - Representing a unit fraction ( $1/b$ ) on a number line between 0 and 1.
  - Representing any fraction ( $a/b$ ) on a number line.
  - Using models to show and explain equivalent fractions.
  - Locating equivalent fractions on a number line.
  - Using models to show and explain whole numbers as fractions.
  - Locating whole numbers as fractions on a number line.
  - Using models to compare two fractions and record the comparison using  $>$ ,  $<$ , or  $=$ .
  - Explaining how the size of equal parts can be used to compare two fractions with the same numerator, and explaining how the number of equal parts can be used to compare fractions with the same denominator.

### **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

#### **Benchmarks (embedded student proficiencies)**

- Grade 3 End of Trimester Assessment

## **Assessment Methods (formative, summative, other evidence and/or student self-assessment)**

- Diagnostic-
  - Show What You Know
  - Digital Personal Math Trainer
  - Interview Assessment
  
- Formative-
  - Lesson Quick Check
  - Mid- Chapter Checkpoint
  - Digital Personal Math Trainer
    - Assessment Animation
    - Assessment Video
  - Standards Practice Pages
  
- Summative Assessment Options:
  - Chapter Review / Test
  - Chapter Test 8 & 9
  - Performance Assessment Task
  - Digital Personal Math Trainer

## **Stage 3: Learning Plan**

### **Student Engagement**

- Small/whole group discussion
- Making content connections
- Using manipulatives
- Critical Thinking and Problem Solving
- Utilizing Interactive Student Edition and Personal Math Trainer
- Math “On the Spot” Videos
- Written, visual, auditory, and hands-on activities
- Class Participation
- Supplemental worksheets
- Interactive website games
- Project-based learning activities

### **Differentiation**

- Intervene
  - Reteach ( In the chapter resources)
  - ELL Activity
  - Strategic Intervention Guide
  - Intensive Intervention Guide
  - Personal Math Trainer
- On Level
  - Practice and Homework
  - ELL Activity
  - HMH Mega Math
  - iTools
- Enrich
  - Advanced Learners Activity
  - Enrich ( in the chapter resources)
  - Extend the Project
  - ELL Activity
  - HMH Mega Math
  - iTools
- Grab and Go! Differentiated Centers Kit
  - Literature
  - Games
  - Activities
  -

### **Learning Experiences**

- Lessons will follow the 4 E structure
  - Engage
  - Explore
  - Explain
  - Evaluate

### **21st Century skills and Technology**

- Lessons will include:
  - Dynamic Interactivities
  - Instructional Videos
  - Critical Thinking
  - Applying Math Knowledge
  - Real World Connections
  - Problem Solving Activities
  - Creativity and Imagination
  - Communication and Collaboration with peers

- Media and Technology integrated lessons
- Cross curricular references

### **Time Allotment: 31 Days**

### **Resources**

- 3.NF.1 GoMath! Grade 3:
  - Lessons: 8.1-8.4, 8.7-8.9
- 3.NF.2 GoMath! Grade 3:
  - Lessons: 8.5 3.NF.3 GoMath!
- Grade 3: Lessons: 8.6, 9.1-9.7
- Think Central
- Personal Math Trainer
- GoMath! Academy

### **Supplemental Resources**

- Visual Fractions - Identify with Lines - Fractions on a Number Line Assessment - <http://www.visualfractions.com/IdentifyLines/identifylines.html>
- Teacher's Domain -“ Introducing Non-Unit Fractions and Equivalence” Lesson - <http://www.teachersdomain.org/resource/vtI07.math.number.fra.lpequiv/>
- HMH School Publishers - Bowling for Fractions - Game - [http://www.hbschool.com/activity/bowling\\_for\\_fractions/](http://www.hbschool.com/activity/bowling_for_fractions/)
- Education Place - Fractions and Regions - Student Tutorial - [http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_popup.shtml&grade=3&chapter=18&lesson=1&title=Fractions+and+Regions&tm=tmfd1801e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_popup.shtml&grade=3&chapter=18&lesson=1&title=Fractions+and+Regions&tm=tmfd1801e)
- NLVM - Parts of a Whole - Interactive Applet - [http://nlvm.usu.edu/en/nav/frames\\_asid\\_102\\_g\\_2\\_t\\_1.html](http://nlvm.usu.edu/en/nav/frames_asid_102_g_2_t_1.html)
- Math Wire - I Have, Who Has - Game - <http://mathwire.com/whohas/whfractions.pdf> UEN - “Fractions” Lesson - <http://www.uen.org/Lessonplan/preview.cgi?LPid=11026>
- PBS Kids Cyberchase - Melvin’s Make a Match - Game - <http://pbskids.org/cyberchase/math-games/melvins-make-match/>
- Phil Tulga - Musical Fraction Bars - Activity - <http://www.philtulga.com/fractionbars.html>

- Sheppard Software - Matching Fractions - Interactive Applet - <http://www.sheppardsoftware.com/mathgames/fractions/fracTut1.htm>
- NLVM - Fraction Pieces - Interactive Applet - <http://enlvm.usu.edu/ma/nav/activity.jsp?sid= shared&cid=clove@fractions&lid=2>
- IXL [Understand fractions: fraction bars](https://www.ixl.com/math/grade-3/understand-fractions-fraction-bars) <https://www.ixl.com/math/grade-3/understand-fractions-fraction-bars>
- Unit Fraction
  - PBS Kids Cyberchase - Thirteen Ways of Looking at a Half - Game - <http://pbskids.org/cyberchase/math-games/thirteen-ways-looking-half/>
  - Math Wire - Thirteen Ways of Looking at a Half - Recording Sheet - <http://mathwire.com/problemsolving/thirteenways.pdf>
  - PBS Kids Cyberchase - Solving Sphinx - Video Tutorial - [http://www.teachersdomain.org/asset/vtl07\\_vid\\_solvsphinx/](http://www.teachersdomain.org/asset/vtl07_vid_solvsphinx/)
  - Education Place - eManipulatives Fractions - Model - [http://www.eduplace.com/cgi-bin/schtemplate.cgi?template=/kids/hmm/manip/mn\\_popup.shtml&filename=fractions\\_prim&title=Fractions&grade=1](http://www.eduplace.com/cgi-bin/schtemplate.cgi?template=/kids/hmm/manip/mn_popup.shtml&filename=fractions_prim&title=Fractions&grade=1)
  - HMH School Publishers - Cross the River - Interactive Applet - [http://www.harcourtschool.com/activity/cross\\_the\\_river/](http://www.harcourtschool.com/activity/cross_the_river/)
  - IXL [Match unit fractions to models](https://www.ixl.com/math/grade-3/match-unit-fractions-to-models) <https://www.ixl.com/math/grade-3/match-unit-fractions-to-models>
  - YouTube - Compare Fractions with the Same Numerator <http://www.youtube.com/watch?v=AlaAXS6VH9s>
  - Math Playground - Fraction Bars [http://www.mathplayground.com/Fraction\\_bars.html](http://www.mathplayground.com/Fraction_bars.html)
  - Education Place - Compare Fractions [http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_popup.shtml&grade=3&chapter=19&lesson=1&title=Compare+Fractions&tm=tmfd1901e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_popup.shtml&grade=3&chapter=19&lesson=1&title=Compare+Fractions&tm=tmfd1901e)
  - PBS Kids Cyberchase - Equal Amounts of Gold <http://www.teachersdomain.org/resource/vtl07.math.number.numms.equalamtgo/>
  - NCTM - Playing Fraction Tracks <http://www.nctm.org/standards/content.aspx?id=26975>
- Literature-
  - Apple Fractions by Jerry Pallotta
  - Clean-Sweep Campers by Lucille Recht Penner
  - The Doorbell Rang by Pat Hutchins
  - Eating Fractions by Bruce McMillan



- Fraction Action by Loreen Leedy
- Give Me Half by Stuart J. Murphy
- Go Fractions by Judith Bauer Stamper
- The Hershey's Milk Chocolate Fraction Book by Jerry Pallotta
- How Many Snails? by Paul Giganti Jr.
- Jump, Kangaroo, Jump by Stuart J. Murphy
- Whole-y Cow! By Taryn Souders

## **Stage 1: Desired Results**

### **Unit 4**

#### **Topic :** Measurement and Data

#### Measurement and Data – 3.MD

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

#### **Content Standards**

- 3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
- 3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
- 3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

- 3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units – whole numbers, halves, or quarters.
- 3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.
  - a. A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.
  - b. 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.
- 3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
- 3.MD.7 Relate area to the operations of multiplication and addition.
  - a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
  - b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
  - c. 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.
  - d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.
- 3.MD.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:**

- How can you use the strategy make a table to organize data and solve problems?

- How can you read and interpret data in a picture graph?
- How can you draw a picture graph to show data in a table?
- How can you read and interpret data in a bar graph?
- How can you draw a bar graph to show data in a table or picture graph?
- How can you solve problems using data represented in bar graphs?
- How can you read and interpret data in a line plot and use data to make a line plot?
- How can you tell time to the nearest minute?
- How can you tell when to use A.M. and P.M. with time?
- How can you measure elapsed time in minutes?
- How can you find a starting time or an ending time when you know the elapsed time?
- How can you use the strategy draw a diagram to solve problems about time?
- How can you generate measurement data and show the data on a line plot?
- How can you estimate and measure liquid volume in metric units?
- How can you estimate and measure mass in metric units?
- How can you use models to solve liquid volume and mass problems?
- How can you find perimeter?
- How can you measure perimeter?
- How can you find the unknown length of a side in a plane figure when you know its perimeter?
- How is finding the area of a figure different from finding the perimeter of a figure?
- How can you find the area of a plane figure?
- Why can you multiply to find the area of a rectangle?
- How can you use the strategy find a pattern to solve area problems?
- How can you break apart a figure to find the area?
- How can you use area to compare rectangles with the same perimeter?
- How can you use perimeter to compare rectangles with the same area?

### **Enduring Understandings**

- Measurement processes are used in everyday life to describe and quantify the world.
- Data displays describe and represent data in alternative ways

### **Knowledge and Skills (SWBAT embedded course proficiencies)**

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects by
  - Saying and writing time to the nearest minute.
  - Measuring a duration of time in minutes (e.g., basketball practice is 45 minutes long).

- Solving addition and subtraction word problems involving durations of time measured in minutes.
- Estimating liquid volumes and masses of objects using standard units of measure (grams, kilograms, and liters).
- Measuring liquid volumes and masses of objects using standard units of measure (grams, kilograms, and liters).
- Using a drawing to represent one-step word problems involving masses or volumes.
- Solving one-step word problems involving masses or volumes using addition, subtraction, multiplication, or division.
- Represent and interpret data by
  - Making a scaled picture graph or bar graph with several categories to represent data (e.g., one square or picture represents 5 objects).
  - Reading and interpreting scaled bar graphs in order to solve one- and two-step “how many more” and “how many less” problems.
  - Using a ruler to measure lengths in whole, half, and quarter inches.
  - Gathering and recording measurement data using whole, half, and quarter inches.
  - Making a line plot with the horizontal scale marked off in whole number, half, or quarter units.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition by
  - Defining a unit square.
  - Defining area as the measure of space with a plane figure and explain why area is measured in square units.
  - Measuring the area of a shape or flat surface by covering it with unit squares – with no gaps or overlaps – and counting the number of unit squares used.
  - Using tiles to find the area of rectangles.
  - Explaining the relationship between tiling and multiplying side lengths to find the area of rectangles.
  - Multiplying adjacent side lengths of rectangles to solve word problems.
  - Using area models to explain the distributive property.
  - Decomposing an irregular figure into non-overlapping rectangles.
  - Explaining area as additive and use this understanding to solve word problems.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures by
  - Identifying polygons.
  - Defining perimeter.

- Finding the perimeter of polygons when given the lengths of all sides.
- Finding unknown side lengths of polygons when given the perimeter.
- Showing how rectangles with the same perimeter can have different areas and showing rectangles with the same area can have different perimeters.
- Solving word problems involving perimeter.

## **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

### **Benchmarks (embedded student proficiencies)**

- Grade 3 End of Trimester Assessment

### **Assessment Methods (formative, summative, other evidence and/or student self-assessment)**

- Diagnostic-
  - Show What You Know
  - Digital Personal Math Trainer
  - Interview Assessment
  
- Formative-
  - Lesson Quick Check
  - Mid- Chapter Checkpoint
  - Digital Personal Math Trainer
    - Assessment Animation
    - Assessment Video
  - Standards Practice Pages
  
- Summative Assessment Options:
  - Chapter Review / Test
  - Chapter Test 2, 10 & 11
  - Performance Assessment Task
  - Digital Personal Math Trainer

## **Stage 3: Learning Plan**

### **Student Engagement**

- Small/whole group discussion
- Making content connections
- Using manipulatives
- Critical Thinking and Problem Solving

- Utilizing Interactive Student Edition and Personal Math Trainer
- Math “On the Spot” Videos
- Written, visual, auditory, and hands-on activities
- Class Participation
- Supplemental worksheets
- Interactive website games
- Project-based learning activities

## **Differentiation**

- Intervene
  - Reteach ( In the chapter resources)
  - ELL Activity
  - Strategic Intervention Guide
  - Intensive Intervention Guide
  - Personal Math Trainer
- On Level
  - Practice and Homework
  - ELL Activity
  - HMH Mega Math
  - iTools
- Enrich
  - Advanced Learners Activity
  - Enrich ( in the chapter resources)
  - Extend the Project
  - ELL Activity
  - HMH Mega Math
  - iTools
- Grab and Go! Differentiated Centers Kit
  - Literature
  - Games
  - Activities
  -

## **Learning Experiences**

- Lessons will follow the 4 E structure
  - Engage
  - Explore
  - Explain
  - Evaluate

## **21st Century skills and Technology**

- Lessons will include:
  - Dynamic Interactivities
  - Instructional Videos
  - Critical Thinking
  - Applying Math Knowledge
  - Real World Connections
  - Problem Solving Activities
  - Creativity and Imagination
  - Communication and Collaboration with peers
  - Media and Technology integrated lessons
  - Cross curricular references

**Time Allotment: 35 Days**

### **Resources**

- 3.MD.1 GoMath! Grade 3:
  - Lessons: 10.1-10.5
- 3.MD.2 GoMath! Grade 3:
  - Lessons: 10.7-10.9
- 3.MD.4 GoMath! Grade 3:
  - Lessons: 10.6, 11.4
- 3.MD.5 GoMath! Grade 3:
  - Lessons: 11.5
- 3.MD.7 GoMath! Grade 3:
  - Lessons: 11.6-11.8
- 3.MD.8 GoMath! Grade 3:
  - Lessons: 11.1-11.3, 11.9-11.10
- 3.MD.B.3 GoMath! Grade 3:
  - Lessons: 2.1-2.6
- 3.MD.B.4 GoMath! Grade 3:
  - Lessons: 2.7
- Think Central
- Personal Math Trainer
- GoMath! Academy

### **Supplemental Resources:**

- IXL - Create Pictographs <http://www.ixl.com/math/grade-3/create-pictographs>

- IXL - Create Bar Graphs <http://www.ixl.com/math/grade-3/create-bar-graphs>
- IXL - Create Line Plots <http://www.ixl.com/math/grade-3/create-line-plots>
- Mr. Myers - Telling Time - Teacher Demonstration Tool  
[http://www.mrmyers.org/Math\\_Mania/Math\\_Games/Jude\\_e-Clock/clock.htm](http://www.mrmyers.org/Math_Mania/Math_Games/Jude_e-Clock/clock.htm)
- Mr. Nussbaum - Bedtime Bandits  
<http://www.mrnussbaum.com/bedtime/index.html>
- Mr. Nussbaum - Clockworks <http://www.mrnussbaum.com/clockworks/index.html>
- IXL - Read Clocks and Write Times <http://www.ixl.com/math/grade-3/read-clocks-and-write-times>
- Harcourt School E-Lab - Elapsed Time: Minutes and Hours  
[http://www.harcourtschool.com/activity/elab2002/grade\\_3/018.html](http://www.harcourtschool.com/activity/elab2002/grade_3/018.html)
- Harcourt School E-Lab - Elapsed Time on a Clock  
<http://www.harcourtschool.com/activity/elab2004/gr4/15.html>
- UEN - "Wow! How Time Flies!"  
<http://www.uen.org/Lessonplan/preview.cgi?LPid=21504>
- Education Place - Measure to the Nearest Half-Inch  
[http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_pop\\_up.shtml&grade=3&chapter=13&lesson=2&title=Measure+to+the+Nearest+Half-Inch&tm=tmfd1302e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_pop_up.shtml&grade=3&chapter=13&lesson=2&title=Measure+to+the+Nearest+Half-Inch&tm=tmfd1302e)
- Education Place - Find Area - Student Tutorial -  
[http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_pop\\_up.shtml&grade=3&chapter=17&lesson=4&title=Find+Area&tm=tmfd1704e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_pop_up.shtml&grade=3&chapter=17&lesson=4&title=Find+Area&tm=tmfd1704e)
- PBS Kids Cyberchase - Calculating Rectangular Area - Video Tutorial -  
<http://www.teachersdomain.org/resource/vtI07.math.measure.polg.calcrectar/>
- PBS Kids Cyberchase - U Fix It With Ziff - Game -  
<http://pbskids.org/cyberchase/math-games/u-fix-it-ziff/>
- PBS Kids Cyberchase - Airlines Builder - Game -  
<http://pbskids.org/cyberchase/math-games/airlines-builder/>
- Investigations - "Same Area, Different Perimeter; Same Perimeter, Different Area" Lesson -  
[http://investigations.terc.edu/library/common\\_core/3U4\\_Session.pdf](http://investigations.terc.edu/library/common_core/3U4_Session.pdf)
- Math Playground - Same Area, Different Perimeters - Video Tutorial -  
[http://www.mathplayground.com/howto\\_sameareadiffperimeter.html](http://www.mathplayground.com/howto_sameareadiffperimeter.html)
- Mister Teacher - Area and Perimeter - Video Tutorial -  
[http://www.misterteacher.com/everything\\_geometry/area\\_perimeter.html](http://www.misterteacher.com/everything_geometry/area_perimeter.html)
- Smart Exchange - Same Perimeter, Different Area - Teacher Demonstration Tool - <http://exchange.smarttech.com/details.html?id=30f99587-5e83-4af2-9553-dc70332c5921>
- PBS Kids Cyberchase - Skate-Off: Final Round, Inez vs. Rimm - Video -  
<http://www.teachersdomain.org/resource/vtI07.math.measure.polg.skateoff2/>



- Literature:
  - Graphs by Bonnie Bader
  - Lemonade for Sale by Stuart J. Murphy
  - Tally O'Malley by Stuart J. Murphy
  - Tiger Math by Ann Whitehead Nagda
  - Carrie Measures Up by Linda Williams Aber
  - Clocks and More Clocks by Pat Hutchins
  - How Do You Know What Time It Is? by Robert E. Wells
  - Inchworm and A Half by Elinor J. Pinczes
  - A Second is a Hiccup by Hazel Hutchins
  - Slowpoke by Lucille Recht Penner
  - Telling Time by Jules Older
  - Bigger, Better, Best! by Stuart J. Murphy
  - Chickens on the Move by Pam Pollack
  - Pezzettino by Leo Lionni
  - Racing Around by Stuart J. Murphy
  - Spaghetti and Meatballs for All: A Mathematical Story by Marilyn Burns
  - Perimeter, Area, and Volume by David Adler Sam's Sneaker Squares by Nat Gabriel

## **Stage 1: Desired Results**

### **Unit 5 Geometry**

#### **Topic :** Geometry – 3.G

- Reason with shapes and their attributes.

#### **Content Standards**

- 3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

- 3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as  $\frac{1}{4}$  of the area of the shape.

### **Essential Questions:**

- What are some ways to describe two-dimensional shapes?
- How can you describe angles in plane shapes?
- How can you use line segments and angles to make polygons?
- How can you describe line segments that are sides of polygons?
- How can you use sides and angles to help you describe quadrilaterals?
- How can you draw quadrilaterals?
- How can you use sides and angles to help you describe triangles?
- How can you use the strategy draw a diagram to classify plane shapes?
- How can you divide shapes into parts and equal areas and write the area as a unit fraction of the whole?

### **Enduring Understandings**

- Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.

### **Knowledge and Skills (SWBAT embedded course proficiencies)**

- Reason with shapes and their attributes by
  - Using attributes to identify shapes.
  - Using attributes to classify shapes into categories.
  - Defining quadrilaterals.
  - Recognizing rhombuses, rectangles, and squares as being examples of quadrilaterals.
  - Drawing quadrilaterals other than rhombuses, rectangles, and squares.
  - Partitioning (dividing) shapes into equal parts with equal areas.
  - Explaining any unit fraction ( $\frac{1}{b}$ ) as one part of a whole divided into  $b$  equal parts (e.g.,  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ )

## **Stage 2: Evidence of Understanding, Learning Objectives and Expectations**

### **Benchmarks (embedded student proficiencies)**

- Grade 3 End of Trimester Assessment

### **Assessment Methods (formative, summative, other evidence and/or student self-assessment)**

- Diagnostic-
  - Show What You Know
  - Digital Personal Math Trainer
  - Interview Assessment
  
- Formative-
  - Lesson Quick Check
  - Mid- Chapter Checkpoint
  - Digital Personal Math Trainer
    - Assessment Animation
    - Assessment Video
  - Standards Practice Pages
  
- Summative Assessment Options:
  - Chapter Review / Test
  - Chapter Test 12
  - Performance Assessment Task
  - Digital Personal Math Trainer

### **Stage 3: Learning Plan**

#### **Student Engagement**

- Small/whole group discussion
- Making content connections
- Using manipulatives
- Critical Thinking and Problem Solving
- Utilizing Interactive Student Edition and Personal Math Trainer
- Math “On the Spot” Videos
- Written, visual, auditory, and hands-on activities
- Class Participation
- Supplemental worksheets
- Interactive website games
- Project-based learning activities

#### **Differentiation**

- Intervene
  - Reteach ( In the chapter resources)
  - ELL Activity

- Strategic Intervention Guide
- Intensive Intervention Guide
- Personal Math Trainer
- On Level
  - Practice and Homework
  - ELL Activity
  - HMH Mega Math
  - iTools
- Enrich
  - Advanced Learners Activity
  - Enrich ( in the chapter resources)
  - Extend the Project
  - ELL Activity
  - HMH Mega Math
  - iTools
- Grab and Go! Differentiated Centers Kit
  - Literature
  - Games
  - Activities
  -

### **Learning Experiences**

- Lessons will follow the 4 E structure
  - Engage
  - Explore
  - Explain
  - Evaluate

### **21st Century skills and Technology**

- Lessons will include:
  - Dynamic Interactivities
  - Instructional Videos
  - Critical Thinking
  - Applying Math Knowledge
  - Real World Connections
  - Problem Solving Activities
  - Creativity and Imagination
  - Communication and Collaboration with peers
  - Media and Technology integrated lessons
  - Cross curricular references

**Time Allotment: 13 Days**

**Resources**

- 3.G.1 GoMath! Grade 3:
  - Lessons: 12.1-12.8
- 3.G.2 GoMath! Grade 3:
  - Lessons: 12.9
- Think Central
- Personal Math Trainer
- GoMath! Academy

**Supplemental Resources:**

- UEN - "Mr. Bo Jangle, What's Your Angle"  
<http://www.uen.org/Lessonplan/preview.cgi?LPid=21496>
- Education Place - Quadrilaterals and Other Polygons  
[http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm\\_pop\\_up.shtml&grade=4&chapter=16&lesson=4&title=Quadrilaterals+and+Other+Polygons&tm=tmfe1604e](http://eduplace.com/cgi-bin/schtemplate.cgi?template=/math/hmm/models/tm_pop_up.shtml&grade=4&chapter=16&lesson=4&title=Quadrilaterals+and+Other+Polygons&tm=tmfe1604e)
- Literature:
  - The Greedy Triangle by Marilyn Burns
  - Shapes, Shapes, Shapes by Tana Hoban

## **New Jersey Student Learning Standards**

<http://www.state.nj.us/education/cccs/>

### **Integration of 21<sup>st</sup> Century Theme(s)**

The following websites are sources for the following 21<sup>st</sup> Century Themes and Skills:

<http://www.nj.gov/education/code/current/title6a/chap8.pdf>

<http://www.p21.org/about-us/p21-framework> .

<http://www.state.nj.us/education/cccs/standards/9/index.html>

### **21st Century Interdisciplinary Themes (into core subjects)**

- **Global Awareness**
- **Financial, Economic, Business and Entrepreneurial Literacy**
- **Civic Literacy**
- **Health Literacy**
- **Environmental Literacy**

### **Learning and Innovation Skills**

- **Creativity and Innovation**
- **Critical Thinking and Problem Solving**
- **Communication and Collaboration**

### **Information, Media and Technology Skills**

- **Information Literacy**
- **Media Literacy**
- **ICT (Information, Communications and Technology) Literacy**

### **Life and Career Skills**

- **Flexibility and Adaptability**
- **Initiative and Self-Direction**
- **Social and Cross-Cultural Skills**
- **Productivity and Accountability**
- **Leadership and Responsibility**

#### **Integration of Digital Tools**

- **Classroom computers/laptops**
- **Technology Lab**
- **FM system**
- **Other software programs**