

# Glen Ridge Public Schools –Mathematics Curriculum



**Course Title: Fifth Grade Math**

**Subject: Mathematics**

**Grade Level: 5**

**Duration: One Year**

**Prerequisite: 4th Grade**

**Elective or Required: Required**

## **Mathematics Mission Statement**

Mathematics is an integral part of our lives. Students must be actively involved in their mathematics education through the use of modeling and demonstrating the ability to persevere through problem solving. The mathematics curricula will emphasize critical thinking skills through a balance of logic and reasoning, attention to precision by utilizing patterns and structure, and bridging these ideas to cross-curricular learning. Students will be engaged and challenged in a student-centered learning environment that is developmentally appropriate and will communicate mathematical ideas, both in a verbal and written form. Through effectively applying hands-on manipulatives, basic computation skills, and the use of technical writing to justify their processes, students will critique the work of themselves and others.

## **Course Description:**

In Grade 5, instructional time will be focused on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of the division of unit fractions by whole numbers and whole numbers by unit fractions; (2) extending division to 2-digit divisors, integrating decimals into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume. Additionally, algebraic thinking, measurement, data, and geometry will be incorporated.

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**Date Submitted:** Summer 2017

## **Fifth Grade Math**

### **Unit 1: Area and Volume**

**Approximate # Of Weeks: 5 weeks**

#### **Essential Questions:**

- How can counting, measuring, or labeling help to make sense of the world around us?
- Why is it important to understand that there are multiple ways to solve a problem?
- When can estimating be a helpful tool?

#### **Upon completion of this unit students will be able to:**

- Explore strategies for finding areas of rectangles of fractional lengths. 5.NF.4, 5.NF 4b, SMP3, SMP6
- Explain solutions to finding area. 5.NF.4, 5.NF 4b, 5.MD.1, SMP1, SMP3, SMP4
- Determine area of a rectangle with fractional side lengths by tiling with squares. 5.NF.4, 5.NF 4b, SMP7, SMP8
- Revise work and collaborate with partners to explain process. SMP6
- Explore volume by comparing the volume of three dimensional objects. 5.MD.3, 5.MD.4, SMP3, SMP6
- Measure the attributes of two dimensional objects and apply similar techniques to measure the volume of three dimensional objects. 5.MD.3, 5.MD.4, SMP3, SMP6
- Count unit cubes to measure volume of a rectangular prism. 5.MD.3, 5.MD.3.a, 5.MD.3b, 5.MD.4, SMP1, SMP2, SMP6
- Apply multiplication and addition strategies after thinking about the layers of a prism to find volume. 5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4, SMP1, SMP3, SMP6
- Apply different formulas to find volume of a rectangular prism. 5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5, 5.MD.5a, 5.MD.5b, SMP6
- Convert units of volume in linear measurement. 5.MD.1, 5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5, 5.MD.5b, SMP6
- Calculate the area of two rectangular prisms. 5.OA.2, 5.MD.3, 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5a, 5.MD.5b, 5.MD.5c, SMP2, SMP6

#### **Interdisciplinary Standards (njcccs.org)**

- **Standard 9.1 21st-Century Life & Career Skills**

All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- **Standard 8.1 – Computer and Information Literacy**

All students will use computer applications to gather and organize information and to solve problems.

- **Standard 8.2 – Technology Education**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world as they relate to the individual, society, and the environment.

**Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral practice using Math Boxes
- Completing Math Journal pages
- Creating area models and visual representations
- Discussing strategies for problem solving
- Completing and critiquing open-response problems
- Completing Home Links
- Making sense of two different answers to an area problem
- Using Activity Cards for:
  - Writing and Answering Mathematical Questions
  - Finding Areas of Rectangles
  - Detecting Volume by Touch
  - Estimating Volume in Nonstandard Units
  - Creating Prism Patterns and Finding Volume with Cubes
  - Finding the Volume of One Stick-On Note
  - Finding Dimensions for a Given Volume
  - Adding to Find Volumes
- Playing EM games (tactile and/or online):
  - Name That Number
  - Baseball Multiplication
  - Buzz
  - Prism Pile-Up
- Utilizing the Student Reference Book
- Utilizing the Everyday Math website
- Practicing skills on Study Island and Khan Academy

**Enrichment Activities:**

- Finding the area of figures with fractional side lengths
- Show area unit conversions
- Creating prisms
- Building and measuring the volume of a polyhedron
- Exploring penticubes
- Rolling dice to create prisms
- Using Volume Formulas

- Estimating to Volume of a Classroom Object
- Estimating, packing cubes in a box
- Creating Prism Pile-Up Cards
- YouCubed

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Exit slips
- Thumbs up/down
- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information
- Teacher webpage
- Khan Academy
- Study Island
- Maths Mansion
- Discovery Education
- BrainPOP
- Study Jams
- Illustrative Mathematics
- Math Antics
- Mr. Nussbaum
- Common Core Math 4Today

## **Unit 2: Whole Number Place Value and Operations**

**Approximate # Of Weeks: 4 weeks**

**Essential Questions:**

- How can counting, measuring, or labeling help to make sense of the world around us?
- Why is it important to understand that there are multiple ways to solve a problem?
- When can estimating be a helpful tool?

**Upon completion of this unit students will be able to:**

- Explore multiplication relationships between places in multidigit numbers. 5.NBT.1, SMP2, SMP7
- Explain patterns in the number of zeros when multiplying by powers of ten. 5.NBT.1, 5.NBT.2, SMP6, SMP7
- Estimate with powers of ten. 5.NBT.2, SMP1, SMP6
- Use U.S. traditional multiplication to multiply 2-digit numbers by 1-digit numbers. 5.NBT.5, SMP1
- Use unit conversions within the U.S. customary system to solve multistep problems. 5.OA.1, 5.OA.2, 5.NBT.5, 5.MD.1, SMP1, SMP4, SMP5
- Use traditional multiplication to find the product of 2-digit numbers by 2-digit numbers and 2-digit numbers by 1-digit numbers. 5.NBT.5; 5.OA.2, SMP1, SMP2
- Use traditional multiplication to find a product of multi digit numbers. 5.NBT.5;SMP1, SMP6
- Divide whole numbers using different strategies. 5.NBT.2, 5.NBT.6, SMP6, SMP7
- Use partial quotient division to solve problems with 3-digit and 4-digit dividends. 5.NBT.6, SMP1, SMP7
- Solve division number stories and interpret remainders. 5.NBT.6, SMP1, SMP4

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- **Standard 8.1 – Computer and Information Literacy**

All students will use computer applications to gather and organize information and to solve problems.

- **Standard 5.1 Science Practices**

All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.

- A. Use mathematical, physical, and computational tools to build

conceptual-based or evidence-based models and to pose theories.

- B. Generate Scientific Evidence through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.

### **Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral practice using Math Boxes
- Completing Math Journal pages
- Drawing Area Models
- Completing Home Links
- Playing EM games (tactile or online)
  - Number Top-It
  - High Number Toss
  - Power Up
  - Multiplication Top-It: Extended Facts
  - Multiplication Top-It: Larger Numbers
  - Baseball Multiplication
  - Prism Pile-Up
  - Multiplication Bull's Eye
  - Multiplication Wrestling
  - Name That Number
  - Division Dash
  - Division Arrays
  - Division Top-It: Larger Numbers
  - Buzz
  - 24
- Utilizing the Student Reference Book
- Using Activity Cards for:
  - Calculating to Explore Place-Value Relationships
  - Practicing Multiplication Strategies
  - Creating and Solving Silly Number Stories
  - Converting Units
  - Practicing US Traditional Multiplication
  - Renaming Dividends to Divide Mentally
  - Dividing with Lists of Multiples
  - Interpreting Remainders in Division Number Stories
- Utilizing the EM website
- Practicing skills on Study Island and Khan Academy

### **Enrichment Activities:**

- Exploring Base-5 Place Value

- Solar System Sightseeing using Powers of Ten
- Freight Train Wrap Around
- Multiplying Larger Numbers using US Traditional Multiplication
- Using Place Value to Multiply
- Writing Unit Conversion Number Stories; Multiplication Number Stories, Division Number Stories
- Using the Egyptian Multiplication Strategy
- Comparing Multiplication Strategies
- Estimating how long it would take to tap a desk one million times
- Exploring other Division Strategies
- Dividing to Convert Units of Length
- Exploring Life Spans
- Writing Division Number Stories
- Solving Word Problems: Continental Math

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Exit slips
- Thumbs up/down
- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information
- Teacher webpage
- Khan Academy
- Study Island
- Maths Mansion
- Discovery Education
- BrainPOP
- Study Jams
- Illustrative Mathematics

- Math Antics
- Mr. Nussbaum
- Common Core Math 4Today
- YouCubed

### **Unit 3: Fraction Concepts, Addition and Subtraction**

**Approximate # Of Weeks: 4 weeks**

**Essential Questions:**

- How do operations affect numbers?
- How can using number relationships help you solve addition and subtraction problems for two digit and three-digit numbers?
- How does your knowledge of multiplication facts help you to solve problems?
- How can a remainder be applied to a real world context?

**Upon completion of this unit students will be able to:**

- Solve division number stories that lead to fractional answers. 5.NF.3, SMP3, SMP4
- Solve division number stories and write number models to build an understanding of fractions as division. 5.NF.3, SMP4, SMP7, SMP7
- Apply understanding of fractions as division to report remainders and fractions. 5.NBT,6, 5.NF.3, SMP1, SMP6, SMP8
- Use number lines to represent, compare and rename fractions. 5.NF.2, 5.NF.3, SMP2, SMP5
- Use fraction number sense to estimate and assess the reasonableness of answers to fraction addition and subtraction problems. 5.NF.2, SMP1, SMP,2, SMP3
- Use benchmarks to estimate sums and differences of fractions. 5.NF.2, SMP2, SMP3
- Rename mixed numbers and fractions greater than one by composing and breaking apart wholes. 5.NF.3, SMP1, SMP3, SMP5
- Use strategies to add and subtract fractions and mixed numbers. 5.NF.2, SMP1, SMP4, SMP5
- Use manipulatives to generate equivalent fractions and add fractions. 5.NF.2, SMP1, SMP4, SMP5
- Solve fraction number stories. 5.NF.1, 5.NF.2, 5.NF.3, SMP1, SMP4
- Solve fraction-of problems. 5.NF.4, 5.NF.4.a, 5.NF.6, SMP1, SMP2,SMP3, SMP6

**Interdisciplinary Standards (njcccs.org)**



- **Standard 9.1 21st-Century Life & Career Skills**

All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- **Standard 8.1 – Computer and Information Literacy**

All students will use computer applications to gather and organize information and to solve problems.

- **Standard 6.3 Active Citizenship in the 21<sup>st</sup> Century**

All students will acquire the skills needed to be active, informed citizens who value diversity and promote cultural understanding by working collaboratively to address the challenges that are inherent in living in an interconnected world.

**Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral practice using Math Boxes
- Completing Math Journal pages
- Drawing Area Models
- Completing Home Links
- Playing EM games (tactile or online)
  - Power-Up
  - Prism Pile-Up
  - Multiplication Top-It: Larger Numbers
  - Build-It
  - Fraction Spin
  - Rename That Mixed Number
  - Division Dash
  - Fraction Capture
  - Fraction Of
  - Number Top-It
- Utilizing the Student Reference Book
- Using Activity Cards for:
  - Solving More Fair Share Stories
  - Writing Number Stories from Fractional Answers
  - Remainder Tic-Tac-Toe
  - Renaming and Comparing Fractions and Mixed Numbers
  - Identifying Unreasonable Answers
  - Renaming Mixed Numbers
  - Solving Fraction Number Stories
  - Finding Fraction Problems That Do Not Belong
  - Breaking Apart Fractions
  - Making Minestrone
  - Solving Fraction-Of Problems
- Utilizing the EM website

- Practicing skills on Study Island and Khan Academy

### **Enrichment Activities:**

- Looking for Patterns in Fair Share Number Stories
- Exploring Relationships in Number Stories
- Sharing a Cost
- Exploring Fractions on a Ruler
- Playing Fractions Top-It
- Writing Fraction Stories
- Finding Fractions that Sum to One
- Playing break It Up!
- Working Backward to Write Fraction Number Stories
- Interpreting Representations
- Adjusting Recipes
- Solving Word Problems:Continental Math

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Exit slips
- Thumbs up/down
- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information
- Teacher webpage
- Khan Academy
- Study Island
- Maths Mansion

- Discovery Education
- BrainPOP
- Study Jams
- Illustrative Mathematics
- Math Antics
- Mr. Nussbaum
- Common Core Math 4Today
- YouCubed

## **Unit 4: Decimal Concepts; Coordinate Grids**

**Approximate # Of Weeks: 4 weeks**

### **Essential Questions:**

- How are fractions, decimals, and percents related to one another?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?
- How can counting, measuring, or labeling help to make sense of the world around us?
- How can the collection, organization, interpretation, and display of data be used to answer questions?

### **Upon completion of this unit students will be able to:**

- Extend place-value patterns to decimals and practice reading and writing decimals to thousandths. 5.NBT.1, 5.NBT.3, SMP2, SMP6, SMP7
- Represent decimals to the thousandths place using base-10 numerals, number names, fractions and thousandths grids. 5.NBT.1, 5.NBT.3, SMP2
- Use expanded form for decimals. 5.NBT.1, 5.NBT.3, SMP2
- Use place-value strategies to compare decimals to the thousandths. 5.NBT.1, 5.NBT.3, SMP1, SMP2, SMP7
- Use number lines to round decimals to a given place. 5.NBT.1, 5.NBT.3, 5.NBT.4, SMP2, SMP8
- Use ordered pairs to plot and identify points. 5.G1, SMP2, SMP6
- Plot points on a coordinate grid. 5. G1,, 5.G2, SMP4, SMP6
- Represent mathematical problems on a coordinate grid; apply rules to ordered pairs. 5.NF.5, 5.G.1, 5.G.2, SMP3, SMP6, SMP8
- Develop and apply a rule to enlarge a picture on a coordinate grid; critique others' work. 5.G.1, 5.G.2, SMP1, SMP2, SMP5, SMP8
- Shade grids to represent and solve decimal addition and subtraction problems. 5.NBT.3, 5. NBT.7, SMP2, SMP6
- Solve addition and subtraction problems with decimals. 5.NBT.4, 5.NBT.7, SMP1, SMP6

- Use decimal concepts to add and subtract money. 5.NBT.7, SMP1, SMP4, SMP6

## **Interdisciplinary Standards (njcccs.org)**

- **Standard 9.1 21st-Century Life & Career Skills**

All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- **Standard 9.3 - Career Awareness, Exploration, and Preparation**

All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.

- **Standard 8.1 – Computer and Information Literacy**

All students will use computer applications to gather and organize information and to solve problems.

- **Standard 8.2 – Technology Education**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world as they relate to the individual, society, and the environment.

- **Standard 6.3 Active Citizenship in the 21<sup>st</sup> Century**

All students will acquire the skills needed to be active, informed citizens who value diversity and promote cultural understanding by working collaboratively to address the challenges that are inherent in living in an interconnected world.

- **Standard 5.1 Science Practices**

All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.

- A. Use mathematical, physical, and computational tools to build conceptual-based or evidence-based models and to pose theories.
- B. Generate Scientific Evidence through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.

## **Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral practice using Math Boxes
- Completing Math Journal pages
- Completing Home Links
- Playing EM games (tactile or online)
  - Fraction Of
  - Fraction Capture

- Decimal Top-It
- Rename that Mixed Number
- Over and Up Squares
- Hidden Treasure
- High Number Toss
- Decimal Top[It: Addition/Subtraction
- Spend and Save
- Utilizing the Student Reference Book
- Using Activity Cards for:
  - Reading and Writing Decimals
  - Representing Decimals with Thousandths Grids
  - Using Expanded Form
  - Spinning to Round
  - Plotting Your Initials
  - Playing Blocks to the Target
  - Plotting a Mystery Word
  - Interpreting Data from a Grid
  - Solving More Decimal Addition and Subtraction Problems with Grids
  - Adding and Subtracting Money Amounts
- Utilizing the EM website
- Practicing skills on Study Island and Khan Academy
- Develop and Apply a Rule to Enlarge a Picture on a Coordinate Grid; discuss others' rules

### **Enrichment Activities:**

- Writing Many Names for Decimals
- Exploring Decimals with Metric Units
- Exploring Decimals through Millionths
- Exploring Batting Averages
- Rounding Repeating Decimals
- Creating Designs with Decimal Coordinates
- Using Latitude and Longitude
- Connect Dots Partner Challenge
- Finding Rules for Graphs
- Writing Decimal Addition and Subtraction Fact Families
- Adding Times; Making a Big Difference
- Spend and Save

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Exit slips
- Thumbs up/down

- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information
- Teacher webpage
- Khan Academy
- Study Island
- Maths Mansion
- Discovery Education
- BrainPOP
- Study Jams
- Illustrative Mathematics
- Math Antics
- Mr. Nussbaum
- Common Core Math 4Today
- YouCubed

## **Unit 5: Operations with Fractions**

**Approximate # Of Weeks: 5 weeks**

### **Essential Questions:**

- How do operations with fractions help us solve everyday problems?
- What is the relationship between improper fractions and mixed numbers?
- Why is finding a common denominator important?
- Why does the multiplication of fractions algorithm work?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?

**Upon completion of this unit students will be able to:**

- Use equivalent fractions to find common denominators and solve problems. 5.NF.1, 5.NF.2, SMP1, SMP2, SMP7
- Use strategies for finding common denominators and use them to add and subtract fractions. 5.NF.1, SMP1, SMP7
- Solve problems involving the addition of fractions and mixed numbers. 5.NF.1, 5.NF.2, SMP1, SMP6
- Solve problems involving the subtraction of fractions and mixed numbers. 5.NF.1, 5.NF.2, SMP1, SMP2, SMP6
- Solve fraction-of problems and connect these problems to multiplication of fractions by whole numbers. 5.NF.4, 5.NF.4a, 5.NF.5, 5.NF.5a, 5.NF.5b, 5.NF.6, SMP3, SMP7, SMP8
- Discuss and apply strategies for multiplying fraction by whole numbers. 5.NF.3, 5.NF.4, 5.NF.4a, 5.NF.5, 5.NF.5a, 5.NF.6, SMP1, SMP3, SMP7
- Apply and extend understanding of finding fractions of whole numbers to find fractions of fractions. 5.NF.4, 5.NF.4a, 5.NF.4b, 5.NF.6, SMP1, SMP4
- Use area models to find fraction products. 5.NF.4, 5.NF.4a, 5.NF.4b, 5.NF.5, 5.NF.5b, SMP2, SMP6
- Use area models to understand and apply an algorithm for fraction multiplication. 5.NF.4, 5.NF.4b, 5.NF.5, 5.NF.5a, 5.NF.5b, 5.NF.6, SMP2, SMP3, SMP8
- Solve fraction number stories by interpreting drawings that model the situation. 5.NF.4, 5.NF.4a, 5.NF.4b, 5.NF.6, SMP1, SMP2, SMP4
- Relate the multiplication rule for equivalent fractions to the effect of multiplying by one. 5.NF.3, 5.NF.4, 5.NF.5, 5.NF.5a, 5.NF.5b, SMP6, SMP7, SMP8
- Create story contexts for fraction multiplication problems. 5.NF.4, 5.NF.4a, 5.NF.4b, 5.NF.5, 5.NF.5a, 5.NF.5b, 5.NF.6, SMP1, SMP2, SMP4
- Use visual models to divide unit fractions by whole numbers. 5.NF.3, 5.NF.7, 5.NF.7a, 5.NF.7c, SMP1, SMP4
- Use visual models to divide whole numbers by unit fractions. 5.NF.7, 5.NF.7b, 5.NF.7c, SMP3, SMP4

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- **Standard 6.3 Active Citizenship in the 21<sup>st</sup> Century**

All students will acquire the skills needed to be active, informed citizens who value diversity and promote cultural understanding by working collaboratively to address the challenges that are inherent in living in an interconnected world.

**Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral practice using Math Boxes
- Completing Math Journal pages
- Creating area models and visual representations
- Discussing strategies for problem solving
- Completing and critiquing open-response problems
- Completing Home Links
- Using Activity Cards for:
  - Finding a Common Denominator
  - Four-in-a-Row Fraction Addition
  - Three-in-a-Row Fraction Subtraction
  - Fraction-Of Problems
  - Multiplying whole Numbers and Fractions
  - Finding Fractions of Fractions
  - Using Area Models to Multiply Fractions
  - Using an Algorithm to Multiply Fractions
- Playing EM games (tactile and/or online):
  - Decimal Top-It: Subtraction
  - Hidden Treasure
  - Buzz or Bizz-Buzz
  - Decimal Top-It: Addition
  - Fraction Of
  - Fraction/Whole Number Top-It
  - Division Top-It: Larger Numbers
  - Multiplication Top-It: Larger Numbers
  - Fraction Top-It: Addition
  - Spend and Save
- Utilizing the Student Reference Book
- Utilizing the Everyday Math website
- Practicing skills on Study Island and Khan Academy

**Enrichment Activities:**

- Finding Recipe Equivalents
- Playing Build-It with Common Denominators
- Exploring a Pattern for Fraction Addition
- Exploring a Pattern for Fraction Subtraction
- Fill-in-the-blank Fraction-Of Problems
- Predicting Sizes of Products



- Solving a Multistep Fraction-Of Problem
- Designing a Community Park
- Multiplying Fractions Greater than 1
- Explaining a Division Rule for Equivalent Fractions
- Comparing Story Contexts
- Exploring Division with Non-Unit Fractions
- Dividing Fractions by Fraction
- Completing and discussing Continental Math problems

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Exit slips
- Thumbs up/down
- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information
- Teacher webpage
- Khan Academy
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- YouCubed

## Unit 6: Investigations in Measurement: Decimal Multiplication and Division

**Approximate # Of Weeks: 4 weeks**

### Essential Questions:

- How can graphing coordinates relate to real world situations?
- How does measurement help solve problems?
- How can understanding units of measurement help you in everyday life?
- What are real world situations when decimals are used to represent numbers?
- How does multiplication and division of decimals compare to the same operations on whole numbers?

### Upon completion of this unit students will be able to:

- Use a calculator to multiply and divide decimals by powers of 10; describe and explain patterns in placement of the decimal point. 5.NBT.1, 5.NBT.2, 5.NBT.3, 5.NBT.3a, SMP6, SMP7, SMP8
- Use patterns to multiply and divide decimals by powers of-10 while playing Exponent Ball. 5.OA.2,5.NBT.1, 5.NBT.2, 5.NBT.3, 5.NBT.3b, SMP1, SMP6, SMP7
- Apply understanding of multiplication and division by powers of 10 to convert measurements in metric units. 5.NBT.2, 5.MD.1, SMP1, SMP7, SMP8
- Create line plots to display measurement data in fractions of a unit, using operations with fractions to solve problems based on the information in the line plots. 5.NF.1, 5.NF.2, 5.MD.1, 5.MD.2, AMP4, SMP6
- Use information presented in line plots to solve problems, including problems about redistributing measurement data. 5.NBT.6, 5.NBT.2, 5.MD.2, SMP4, SMP7, SMP8
- Apply knowledge of volume concepts to calculate the volume of a building. 5.MD.3, 5.MD.5, 5.MD.5b, 5. MD.5c, SMP1, SMP6
- Use displacement to measure the volume of objects. 5.MD.3, 5.MD.4, 5.MD.5, 5. MD.5b, SMP1, SMP5, SMP6
- Use estimation and number sense to predict the relative size of decimal products and quotients. 5.OA.2, 5.NBT.7, 5.NF.5, 5.NF.5a, 5.NF.5b, SMP1, SMP3, SMP8
- Use two strategies for solving decimal multiplication problems. 5.NBT.2, 5.NBT.5, 5.NBT.7, SMP1, SMP7
- Solve a multi-step number story using decimals and explain strategies and solutions. 5.NBT.2, 5.NBT.5, 5.NBT.7, SMP1, SMP4, SMP6
- Discuss how estimation can be used to place the decimal point when dividing decimals by whole numbers. 5.NBT.6, 5.NBT.7, SMP1, SMP3, SMP6
- Create equivalent problems to solve division problems involving decimal dividends and divisors. 5.NBT.1, 5.NBT.6, 5.NBT.7, 5.NF.3, SMP1, SMP7

- Collect data and create a line plot, computing with decimals to identify typical responses and estimate total class response. 5.OA.1, 5.NBT.3, 5.NBT.3b, 5.NBT.7, 5.MD.2, SMP1, SMP4, SMP5

### **Interdisciplinary Standards (njcccs.org)**

- **Standard 9.1 21st-Century Life & Career Skills**

All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- **Standard 9.3 - Career Awareness, Exploration, and Preparation**

All students will apply knowledge about and engage in the process of career awareness, exploration, and preparation in order to navigate the globally competitive work environment of the information age.

- **Standard 8.1 – Computer and Information Literacy**

All students will use computer applications to gather and organize information and to solve problems.

- **Standard 8.2 – Technology Education**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world as they relate to the individual, society, and the environment.

- **Standard 6.3 Active Citizenship in the 21<sup>st</sup> Century**

All students will acquire the skills needed to be active, informed citizens who value diversity and promote cultural understanding by working collaboratively to address the challenges that are inherent in living in an interconnected world.

- **Standard 5.1 Science Practices**

All students will understand that science is both a body of knowledge and an evidence-based, model-building enterprise that continually extends, refines, and revises knowledge. The four Science Practices strands encompass the knowledge and reasoning skills that students must acquire to be proficient in science.

- A. Use mathematical, physical, and computational tools to build conceptual-based or evidence-based models and to pose theories.
- B. Generate Scientific Evidence through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.

### **Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral Practice using Math Boxes
- Completing Math Journal pages
- Creating pictorial and 3D representations
- Discussing strategies for problem solving
- Completing and critiquing open-response problems

- Completing Home Links
- Using Activity Cards for:
  - Multiplying and Dividing by Powers of 10
  - Comparing Animal Weights
  - Converting Measurements in the Metric System
  - Line Plot Problems
  - Practicing Decimal Estimation
  - Comparing Decimal Products
  - Dividing Decimals by Whole Numbers
  - Dividing Decimals by Decimals
- Playing EM games (tactile and/or online):
  - Exponent Ball
  - Decimal Top-It
  - Prism Pile-Up
  - Doggone Decimal
  - Decimal Domination
  - Spend and Save
  - Division Top-It: Larger Numbers
  - Fraction/Whole Number Top-It
- Utilizing the Student Reference Book
- Utilizing the Everyday Math website
- Utilizing Study Island and Khan Academy

### **Enrichment Activities:**

- Exploring Multiplication with Powers of 10
- Forming Expressions with Powers of 10
- Converting the Distance to the Moon
- Conducting a Measurement Investigation
- Comparing Diving Scores
- Solving a Packaging Problem
- Solving Overflow Problems
- Estimating Decimal Products and Quotients in Number Stories
- Solving Real-World Decimal Multiplication Problems
- Exploring Column Division
- Finding a More Precise Answer
- Collecting and Interpreting Data
- Completing and discussing Continental Math problems

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Exit slips
- Thumbs up/down

- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information
- Teacher webpage
- Khan Academy
- Study Island
- Maths Mansion
- Discovery Education
- BrainPOP
- Study Jams
- Illustrative Mathematics
- Math Antics
- Mr. Nussbaum
- Common Core Math 4Today
- YouCubed

## **Unit 7: Multiplication of Mixed Numbers; Geometry; Graphs**

**Approximate # Of Weeks: 4 weeks**

### **Essential Questions:**

- How is the ability to perform operations with fractions (or mixed numbers) relevant to everyday life?
- How can spatial relationships be described by use of geometric language?
- What types of data can be collected to more clearly understand real life situations?
- How can the collection, organization, interpretation, and display of data be used to answer questions?

**Upon completion of this unit students will be able to:**

- Use area models and partial products to multiply mixed numbers. 5.OA.2, 5.NF.1, 5.NF.4, 5.NF.4a, 5.NF.4b, 5.NF.5, 5.NF.5a, 5.NF.6, SMP2, SMP7
- Multiply mixed numbers by renaming factors and fractions and using a fraction multiplication algorithm. 5.NF.3, 5.NF.4, 5.NF.4a, 5.NF.4b, 5.NF.5a, 5.NF.5b, 5.NF.6, SMP1, SMP2
- Multiply mixed numbers to find the areas of rectangles with fractional side lengths and confirm areas by tiling with squares of unit fraction side lengths. 5.NF.4, 5.NF.4b, 5.NF.6, SMP1, SMP4
- Solve fraction division problems by renaming dividends and divisors with a common denominator. 5.NF.5, 5.NF.5b, 5.NF.7, 5.NF.7a, 5.NF.7b, 5.NF.7c, SMP1, SMP8
- Classify triangles in hierarchy based on properties. 5.G.3, 5.G.4, SMP2, SMP7
- Classify quadrilaterals in a hierarchy based on properties. 5.G.3, 5.G.4, SMP2, SMP7
- Learn a game to practice naming and classifying quadrilaterals based on properties. 5.G.3, 5.G.4, SMP2, SMP7, SMP8
- Create a new hierarchy with given polygons and analyze and discuss other possible hierarchies. 5.G.3, 5.G.4, SMP1, SMP2, SMP6, SMP7
- Organize and represent fractional data on line plots using operations with fractions to solve problems. 5.NF.1, 5.NF.2, 5.NF.4, 5.MD.2, SMP4, SMP6
- Use rules to generate sequences, identify relationships between corresponding terms, and graph points on a coordinate grid to visualize patterns and relationships. 5.OA.3, 5.G.1, 5.G.2, SMP2, SMP8
- Analyze patterns and rules in tables of values, create graphs to represent the data, and answer questions using rules, tables, and graph. 5.OA.3, 5.MD.1, 5.G.1, 5.G.2, SMP4, SMP7
- Use rules, tables, and graphs to compare real-world relationships and solve problems. 5.OA.3, 5.G.1, 5.G.2, SMP4, SMP8
- Identify relationships between patterns; graph ordered pairs from corresponding terms of patterns and use the graph to analyze real-world phenomenon. 5.OA.3, 5.G.1, 5.G.2, SMP7, SMP8

### **Interdisciplinary Standards (njcccs.org)**

- **Standard 9.1 21st-Century Life & Career Skills**

All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- **Standard 8.1 – Computer and Information Literacy**

All students will use computer applications to gather and organize information and to solve problems.

- **Standard 8.2 – Technology Education**

All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world as they relate to the

individual, society, and the environment.

**Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral practice using Math Boxes
- Completing Math Journal pages
- Creating pictorial representations
- Completion of Home Links
- Using Activity Cards for:
  - Multiplying Mixed Numbers
  - Comparing Methods for Multiplying Mixed Numbers
  - Tiling the Bathroom Floor
  - Practicing Fraction Division
  - Using Triangle Hierarchies
  - Counting Categories
  - Visualizing Patterns and Relationships
- Playing EM games (tactile and/or online):
  - Spoon Scramble
  - Exponent Ball
  - Doggone Decimal
  - Fraction Top-It: Addition
  - What's My Attribute Rule?
  - Property Pandemonium
  - Decimal Domination
- Utilizing the Student Reference Book
- Utilizing the EM website
- Utilizing Study Island and Khan Academy

**Enrichment Activities may include:**

- Exploring Patterns in Partial Products
- Multiplying Mixed Numbers in Context
- Exploring the Resolution of Digital Displays
- Using Common Denominators to Divide Fractions by Fractions
- Comparing Hierarchies and Venn Diagrams
- Quadrilateral Challenge Problems
- Exploring Mystery Hierarchies
- Thinking about Precision with Fractional Data
- Visualizing Patterns in Data
- Graphing your Super Power
- Graphing Race Results
- Exploring Relationships Between Patterns

- Completing and discussing Continental Math problems

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Exit slips
- Thumbs up/down
- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information
- Teacher webpage
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- Common Core Math 4Today
- YouCubed

## **Unit 8: Applications of Measurement, Computation, and Graphing**

**Approximate # Of Weeks: 5 weeks**

### **Essential Questions:**

- How do mathematical ideas interconnect and build on one another to produce a



coherent whole?

- How is math relevant to me?
- What do numbers convey?
- What are efficient methods for finding sums, differences, products, and quotients?
- How do units of measurement (within a system) relate to one another?
- What questions can be answered using addition, subtraction, multiplication, and division?
- How can fractions be used to gain information?

**Upon completion of this unit students will be able to:**

- Make unit conversions to find areas of sports playing surfaces in square feet and use findings to plan an athletic center. 5.NBT.5, 5.NBT.7, 5.NF.4, 5.NF.4b, 5.NF.6, 5.MD.1, SMP4, SMP6, SMP7
- Apply understanding of rectangular areas to find areas of non-rectangular shapes. 5.NF.1, 5.NF.4, 5.NF.4b, SMP1, SMP2
- Apply length, area, and volume concepts to plan a home aquarium. 5.NF.4, 5.NF.4b, 5.NF.6, 5.MD.3, 5.MD.5, 5.MD.5a, 5.MD.5b, 5.MD.5c, SMP4, SMP6
- Use representations to solve a problem about the volume of a rectangular prism and discuss strategies. 5.MD.3, 5.MD.5, 5.MD.5b, SMP1, SMP2
- Devise a plan for spending \$1,000,000 to open and operate an animal shelter for one year. 5.NBT.4, 5.NBT.5, 5.MD.1, SMP1, SMP6
- Calculate how long it would take to earn \$1,000,000 at different hourly wages. 5.NBT.5, 5.NBT.6, 5.NBT.7, 5.MD.1, SMP1, SMP7
- Convert measurement units and perform operations with multidigit whole numbers and decimal to solve time and distance problems. 5. NBT.2, 5.NBT.5, 5.NBT.6, 5.NBT.7, 5. MD.1, SMP1, SMP6
- Collect heart-rate data and use multiplication and unit conversions to find the number of times their hearts beat in different units of time. 5.OA.3, 5.NBT.5, 5.MD.1, SMP1, SMP4, SMP6
- Graph heart-rate data and use the graphs to analyze the data. Use multiplication and division to calculate and compare cardiac outputs before and after exercise. 5.NBT.5, 5.NBT.6, 5.NBT.7, 5.MD.1, 5.G.1, 5.G.2, SMP1, SMP4
- Apply knowledge of place value and coordinate grids to investigate the effect of pendulum length on pendulum swing time. 5. NBT. 2, 5.NBT.4, 5.G.1, 5.G.2, SMP3, SMP4, SMP6
- Use graphs to investigate the effect of arc size on a pendulum's swing time. 5.NBT.2, 5.NBT.4, 5.G.1, 5.G.2, SMP3, SMP4

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- A. Use mathematical, physical, and computational tools to build conceptual-based or evidence-based models and to pose theories.
- B. Generate Scientific Evidence through Active Investigations: Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.

### **Activities – include 21<sup>st</sup> Century Technologies:**

- Mental math and fluency review
- Spiral practice using Math Boxes
- Completing Math Journal pages
- Creating area models and pictorial representations
- Discussing strategies for problem solving
- Completing and critiquing open-response problems
- Completing Home Links
- Using Activity Cards for:
  - Practicing the Rectangle Method
  - Solving Measurement Problems
  - Investigating Heart Rate
  - Using the Pendulum-Length Graph
- Playing EM games (tactile and/or online):
  - Exponent Ball
  - Property Pandemonium

- Decimal Domination
- Spoon Scramble
- Utilizing the Student Reference Book
- Utilizing the EM website
- Utilizing Study Island and Khan Academy

### **Enrichment Activities**

- Converting between Measurement Systems
- Applying the Rectangle Method (for area) to More Shapes
- Designing a Fish Tank
- Using Fractions to Adjust Spending
- Solving a Water Fountain Problem
- Comparing National Debts
- Extending the Footstep Problem
- Investigating Breathing Rates
- Donating Blood
- Exploring Pendulum Clocks
- Researching Pendulums
- Continental Math

### **Methods of Assessments/Evaluation:**

- Study Island
- Online or paper tests/quizzes
- Pictorial representation
- Exit slips
- Thumbs up/down
- Dry erase boards
- Find the mistake/error analysis
- Poster
- Math Journal
- Project
- Classwork
- Homework
- Self-assessment
- Observation
- Center/workstation activities
- Open-ended questions
- Verbal assessment

### **Resources/Including Online Resources**

- Online textbook information

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- Maths Mansion
- Discovery Education
- BrainPOP
- Study Jams
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