

Glen Ridge Public Schools –Mathematics Curriculum



Course Title: 4th Grade Mathematics

Subject: Mathematics

Grade Level: 4

Duration: Full Year

Prerequisite: N/A

Elective or Required: N/A

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:

The purpose of this course in Mathematics is to build students that are able to make sense of problems and persevere in solving them, guide students to reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, use appropriate tools and attend to precision. Students will learn to model with mathematics, look for and make use of structure, and look for and express regularity and repeated reasoning.

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Date Submitted: Summer 2017

4th Grade Mathematics

Topic/Unit: Unit 1: Place Value; Multidigit Addition and Subtraction

Approximate # Of Weeks: 4 and ½ Weeks

Essential Questions:

- What are the place-value concepts for multi-digit whole numbers?
- How can traditional U.S. addition and subtraction be used to add and subtract multi-digit numbers?

Upon completion of this unit students will be able to:

- Work with place value in whole numbers through hundred-thousands (4.NBT.1, 4.NBT.2, 4.NBT.5);
- Record numbers in expanded form and compare numbers through the hundred-thousands (4.NBT.1, 4.NBT.2);
- Learn procedures for rounding numbers through hundred-thousands (4.NBT.2, 4.NBT.3);
- Receive an introduction to the *Student Reference Book (SRB)* and continue place-value work (4.NBT.1, 4.NBT.2, 4.NBT.3, 4.NBT.4);
- Explore different ways to estimate (4.OA.3, 4.NBT.3, 4.NBT.4);
- Practice solving multi-step number stories involving addition and subtraction (4.OA.3, 4.NBT.4);
- Solve a problem about codes based on place-value structures (4.OA.5, 4.NBT.1);
- Discuss some solutions and similarities between codes and the base-10 place-value, and revise work (4.OA.5, 4.NBT.1);
- Explore the U.S. traditional form of subtraction (4.OA.3, 4.NBT.2, 4.NBT.4);
- Convert between yards, feet, and inches (4.NBT.3, 4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.2);
- Explore properties of points, line segments, lines, and rays (4.G.1);
- Learn properties of angles, triangles, and quadrilaterals (4.G.1, 4.G.2);
- Develop a formula for finding the perimeter of a rectangle (4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.3, 4.G.2).

Interdisciplinary Standards (njcccs.org)

- Standard 8.1- Computer and Information Literacy
- Standard 5.1 - Science Practices

Activities – include 21st Century Technologies:

- Create a Compact Place-Value Flip Book;
- Play *Addition Top-It*;
- Build numbers in expanded form using base-10 blocks;
- Play *Subtraction Top-It*;
- Find the halfway point on number lines;
- Compare and round numbers using number cards;

- Play *Number Top-It*;
- Build, round, and estimate using base-10 blocks;
- Play *Spin- and-Round*;
- Solve number stories using situation diagrams;
- Review column-addition using base-10 blocks to model each step;
- Solve open-response problems about place-value;
- Review trade-first subtraction using base-10 blocks;
- Find personal references for inches, feet, and yards by estimating lengths of objects and distances;
- Model line segments on a geoboard;
- Sort pattern blocks according to geometric properties;
- Investigate perimeters on a geoboard;

Enrichment Activities:

- Solve number-grid puzzles;
- Collect large numbers using newspapers, magazines, and atlases;
- Rounds data found in a bar graph;
- *Explore big numbers using the story How Much is a Million?* (David M. Schwartz);
- Plan a balanced meal using a weekly grocery store advertisement and a given budget;
- Write multi-step number stories alone or in pairs;
- Solve number-tile addition problems using sets of number tiles 0-9;
- Solve number-tile subtraction problems using sets of number tiles 0-9;
- Convert measures of migratory bird data by completing a data table;
- Solve a Collinear-Points Puzzle;
- Solve a polygon puzzles;
- Investigate pattern-block perimeters using pattern blocks.

Methods of Assessments/Evaluation:

- Unit Assessment
- Exit Slips
- Study Island
- Thumbs Up/Thumbs Down
- Pair/Share
- Math Boxes
- Manipulatives
- Observation (Teacher/Small/Whole Group)
- Center Activities
- Math Journal
- Self-Assessments
- Whiteboards
- Weekly Assessments
- Homework
- Class work
- Independent Work

- Real World Apps
- Journal Reflective
- Open Ended Questions
- Verbal Assessment
- Rhetorical Questions
- Projects

Resources/Including Online Resources

- Online Textbook
- Teacher Webpage
- Everyday Mathematics Onlines
- Khan Academy
- IXL
- Study Islands
- XtraMath

Topic/Unit: Unit 2: Multiplication and Geometry

Approximate # Of Weeks: 4 and ½ Weeks

Essential Questions:

- What are the various applications for multiplication?
- How can shapes be classified by their properties?
- What is the formula for finding the area of a rectangle?

Upon completion of this unit students will be able to:

- Review rectangular arrays and explore patterns in square numbers (4.OA.5, 4.NBT.5);
- Relate previous work with area to develop the formula for the area of a rectangle (4.NBT.4, 4.NBT.5, 4.MD.3);
- Work with factor pairs, arrays, and corresponding equations (4.OA.4, 4.NBT.5, 4.NBT.6);
- Learn that a whole number is a multiple of each of its factors (4.OA.4, 4.OA.5, 4.NBT.5, 4.NBT.6);
- Classify numbers as prime and composite (4.OA.4, 4.NBT.5, 4.NBT.6);
- Use multiplicative reasoning to make predictions based on information in an open-response problem and then make mathematical arguments to support their predictions (4.OA.1, 4.OA.2, 4.OA.5);
- Convert units of time to smaller units of time to solve number stories involving time (4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.2);
- Create and interpret statements and equations for multiplicative comparisons (4.OA.1, 4.OA.2, 4.NBT.5);
- Solve number stories involving multiplicative comparisons (4.OA.1, 4.OA.2, 4.NBT.4, 4.NBT.5);
- Classify triangles by angle properties (4.G.2);
- Classify quadrilaterals by their properties (4.G.1, 4.G.2);
- Explore symmetry in nature, objects, and shapes (4.G.3);
- Review the “What’s My Rule?” routine to analyze patterns.

Interdisciplinary Standards (njcccs.org)

- Standard 9.1 - 21st-Century Life & Career Skills
- Standard 6.3 - Active Citizenship in the 21st Century
- Standard 9.3 - Career Awareness, Exploration, and Preparation

Activities – include 21st Century Technologies:

- Build rectangular arrays;
- Play *Subtraction Target Practice*;
- Play *Spin-and-Round*;
- Find areas of rectangles;
- Play *Fishing for Digits*;
- Factor numbers with cube arrays;
- Play *Buzz* and *Bizz-Buzz*;

- Play *Factor Bingo*;
- Build Arrays with centimeter cubes (activity card 20);
- Make conjectures and arguments;
- Draw lines, line segments, rays, and angles;
- Gauge the length of a second, minute, and an hour;
- Play *Factor Captor*;
- Review the “hard facts” using multiplication/division Fact Triangles;
- Solve additive comparison number stories;
- Play *Rugs and Fences*;
- Identify right angles;
- Play *Number Top-It*;
- Explore parallel line segments with geoboards;
- Play *How Much More?* (game);
- Create symmetrical designs with pattern blocks, paper, and straightedge;
- Model functional relationships with pattern blocks;

Enrichment Activities:

- Play *One More, One Less* (activity card 16);
- Compare perimeter and area;
- Extend concept of factors by playing *Factor Captor*;
- Solve number stories with factors and multiples;
- Explore Goldbach’s Conjecture to investigate prime numbers;
- Write time number stories;
- Compare animal weights using factual data;
- Extend *How Much More?* (game);
- Sort triangles (activity card 23);
- Solve quadrilateral riddles;
- Complete a Venn diagram to identify letters in the alphabet with lines of symmetry;
- Find patterns on the number grid (activity card 26);

Methods of Assessments/Evaluation:

- Unit Assessment
- Exit Slips
- Study Island
- Thumbs Up/Thumbs Down
- Pair/Share
- Math Boxes
- Manipulatives
- Observation (Teacher/Small/Whole Group)
- Center Activities
- Math Journal
- Self-Assessments
- Whiteboards
- Weekly Assessments
- Homework

- Class work
- Independent Work
- Real World Apps
- Journal Reflective
- Open Ended Questions
- Verbal Assessment
- Rhetorical Questions
- Projects

Resources/Including Online Resources

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- Everyday Mathematics Onlines
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- IXL
- Study Islands
- XtraMath

Topic/Unit: Unit 3: Fractions and Decimals

Approximate # Of Weeks: 4 and ½ Weeks

Essential Questions:

- What is the factor equivalence?
- How can fractions be compared using different representations?
- How can the understanding of fractions and decimals be extended using the same methods for comparing fractions?

Upon completion of this unit students will be able to:

- Extend their understanding of fraction equivalence by solving number stories involving equally shared quantities (4.NF.1, 4.NF.2, 4.MD.2);
- Use an area model to recognize and generate equivalent fractions (4.OA.4, 4.OA.5, 4.NF.1);
- Use a length or number-line model to recognize and generate equivalent fractions (4.NF.1, 4.NF.2);
- Generalize work with visual fraction models to explain why a fraction as a/b is equivalent to a fraction $n*a/n*b$ (4.OA.4, 4.OA.5, 4.NF.1);
- Use mathematical models to compare fractions with different numerators and denominators and justify their reasoning (4.NF.2);
- Compare fractions in number stories (4.NF.1, 4.NF.2);
- Learn strategies to order fractions and place them accurately on number lines (4.NF.2);
- Explore the relationship between fractions and decimals (4.NF.1, 4.NF.3, 4.NF.3b, 4.NF.6, 4.NF.7, 4.MD.2);
- Model decimals with base-10 blocks (4.NF.6);
- Read and write decimal numbers to hundredths (4.NF.5, 4.NF.6, 4.NF.7);
- Explore decimals in the context of measurement (4.NF.6, 4.NF.7, 4.MD.1, 4.MD.2);
- Explore millimeters and convert from centimeters to millimeters (4.OA.2, 4.NF.6, 4.NF.7, 4.MD.1, 4.MD.2);
- Compare decimals using $<$, $>$, and $=$ (4.NF.6, 4.NF.7, 4.MD.2).

Interdisciplinary Standards (njcccs.org)

- Standard 9.1 - 21st-Century Life & Career Skills
- Standard 9.3 - Career Awareness, Exploration, and Preparation
- Standard 6.3 - Active Citizenship in the 21st Century

Activities – include 21st Century Technologies:

- Review how to share equally by reading the story *Give Me Half!*;
- Explore fraction circles;
- Play *Buzz* and *Bizz-Buzz*;
- Find equivalent fractions using fraction circles;
- Explore fractions of circles using colored parts of given circles;

- Use mathematical models to compare fractions with different numerators and denominators to justify their reasoning;
- Compare fractions with the same numerator or denominator;
- Play *Spin-and-Round*;
- Sort fractions;
- Play *Fraction Top-It*;
- Play *Rugs and Fences*;
- Represent fractions in different ways;
- Play *Fraction Match*;
- Use money to explore decimals;
- Play *Polygon Capture*;
- Explore the relationships among hundredths, tenths, and ones using *Base-10 Decimal Exchange* (activity card 33);
- Review linear metric measure with *How Close is a Meter?* (activity card 35);
- Compare millimeters and centimeters using a ruler;
- Compare decimals in money by playing *Coin Top-It* (activity card 38);

Enrichment Activities:

- Solve a proportional reasoning problem;
- Model fraction equivalencies using pattern blocks;
- Play *Fraction Match*;
- Find equal fraction sections (activity card 28);
- Identify equivalent fractions on number lines;
- Model fraction equivalencies by matching equivalent fractions;
- Complete Name-Collection Boxes;
- Write and solve fraction-comparison number stories;
- Create fractions (activity card 30);
- Explore hundredths with a fraction/decimal wheel (activity card 31);
- Create a *Decimals All Around Museum* (activity card 32);
- Explore the whole;
- Find the hundredths with coins;
- Solve place-value puzzles;
- Use a Place-Value Flip Book for Decimals (activity card 34);
- Extend metric equivalencies using *Metric Conversion with Decimals* (activity card 36);
- Measure in centimeters with rulers and meter sticks;
- Explore the use of prefixes and metric units using *Metric Prefixes* (activity card 37);
- *Order Decimals Between Whole Numbers* (activity card 39);
- Play *Decimal Top-It*;

Methods of Assessments/Evaluation:

- Unit Assessment
- Exit Slips
- Study Island
- Thumbs Up/Thumbs Down

- Pair/Share
- Math Boxes
- Manipulatives
- Observation (Teacher/Small/Whole Group)
- Center Activities
- Math Journal
- Self-Assessments
- Whiteboards
- Weekly Assessments
- Homework
- Class work
- Independent Work
- Real World Apps
- Journal Reflective
- Open Ended Questions
- Verbal Assessment
- Rhetorical Questions
- Projects

Resources/Including Online Resources

- Online Textbook
- Teacher Webpage
- Everyday Mathematics Onlines
- Khan Academy
- IXL
- Study Islands
- XtraMath

Topic/Unit: Unit 4: Multidigit Multiplication

Approximate # Of Weeks: 4 and ½ Weeks

Essential Questions:

- What are the basic principles of multidigit multiplication?
- How can multiplication skills be extended by exploring the partial-products method?
- How can knowledge of multiplication be used to find the areas of rectangles and to convert units of measurement?

Upon completion of this unit students will be able to:

- Find a rule for solving multiplication problems involving multiples of 10 (4.OA.2, 4.NBT.1, 4.NBT.5);
- Make estimates and evaluate the reasonableness of their answers (4.OA.3, 4.NBT.3, 4.NBT.4, 4.NBT.5);
- Solve multiplication problems by partitioning rectangles (4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.3);
- Convert liters to milliliters (4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MD.1);
- Use multiplication or division to decide if one million dollars will fit in a large box (4.NBT.1, 4.NBT.5);
- Explore the partial-products multiplication strategy (4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.3);
- Further explore the metric system and convert kilograms to grams (4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MD.1, 4.MD.2);
- Solve multistep number stories involving money (4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.1, 4.MD.2);
- Extend work with partial products and multiply 2-digit numbers by 2-digit numbers (4.NBT.2, 4.NBT.4, 4.NBT.5, 4.MD.3);
- Play a game to practice the basic principles of multiplication with multidigit numbers (4.NBT.2, 4.NBT.4, 4.NBT.5);
- Find the area of rectangles and rectilinear figures using multidigit computation (4.NBT.4, 4.NBT.5, 4.MD.3, 4.G.2);
- Solve multistep multiplication problems and use estimates to assess the reasonableness of their answers (4.OA.3, 4.NBT.3, 4.NBT.4, 4.NBT.5);
- Students explore the lattice method of multiplication (4.NBT.5).

Interdisciplinary Standards (njcccs.org)

- Standard 9.1 - Century Life & Career Skills
- Standard 9.3 - Career Awareness, Exploration, and Preparation
- Standard 8.2 - Technology Education
- Standard 6.3 - Active Citizenship in the 21st century

Activities – include 21st Century Technologies:

- Play *Rugs and Fences* (game);
- Play *Multiplication Top-It* (game);

- Play *Spin-and-Round* (game);
- Play *Factor Captor* (game);
- Play *Polygon Capture* (game);
- Choose units to measure liquid amounts;
- Use multiplication or division to decide if one million dollars will fit in a large box;
- Decompose large numbers;
- Play *Fraction/Decimal Concentration* (game);
- Compare grams and kilograms;
- Play *How Much More?* (game);
- Play *Playing Dollar Exchange Game* (activity card 48);
- Play *Fraction Top-It* (game);
- Review partial-sums addition;
- Play *Fraction Match* (game);
- Explore area using *Exploring Area* (activity card 18);
- Play *Number Top-It* (game);
- Use *The Guide to Solving Number Stories*;
- Play *Decimal Top-It* (game);
- Play *Beat the Calculator* (game).

Enrichment Activities:

- *Investigating Millions and Billions* (activity card 40);
- Play *Beat the Calculator* (extended multiplication facts version);
- Find missing numbers and digits using place-value structure;
- Practice estimation strategies using *Planning a Party* (activity card 41);
- *Solve an Old Puzzle* (activity card 42);
- Products of Points (activity card 43);
- Investigate liters and millimeters;
- *Purchasing Liquids in Liters and Milliliters* (activity card 44);
- Explore multiplication using *Ancient Egyptian Multiplication* (activity card 45);
- Complete Products for Points (activity card 46);
- Research universal standards for metric measures using *International System of Units* (activity card 47);
- Convert marine mammal data;
- Write multistep number stories using *Traveling by Train and Bus* (activity card 49);
- Solve multistep number stories involving money;
- Multiplying with *Russian Peasant Multiplication* (activity card 50);
- Complete *Products for Points, Part 3* (activity card 51);
- Examine a *Multiplication Wrestling Competition*;
- *Finding Multiplication Wrestling Errors* (activity card 52);
- Find the area and the perimeter of a tennis court;
- Expand game *Rugs and Fences*;
- Write More Multistep Number Stories (activity card 53);
- Investigate Napier's Rods;
- Practice lattice multiplication.

Methods of Assessments/Evaluation:

- Unit Assessment
- Exit Slips
- Study Island
- Thumbs Up/Thumbs Down
- Pair/Share
- Math Boxes
- Manipulatives
- Observation (Teacher/Small/Whole Group)
- Center Activities
- Math Journal
- Self-Assessments
- Whiteboards
- Weekly Assessments
- Homework
- Class work
- Independent Work
- Real World Apps
- Journal Reflective
- Open Ended Questions
- Verbal Assessment
- Rhetorical Questions
- Projects

Resources/Including Online Resources

- Online Textbook
- Teacher Webpage
- Everyday Mathematics Onlines
- Khan Academy
- IXL
- Study Islands
- XtraMath

Topic/Unit: Unit 5: Fraction and Mixed Number Computation; Measurement

Approximate # Of Weeks: 4 Weeks

Essential Questions:

- What is the whole of a fraction?
- How do we add and subtract fractions and mixed numbers?

Upon completion of this unit students will be able to:

- Decompose fractions into sums of fractions with the same denominator (4.NF.3, 4.NF.3b);
- Find a whole when given a fractional part of a region (4.NF.3, 4.NF.3a, 4.NF.3b);
- Add fractions with like denominators within number stories (4.NF.3, 4.NF.3a, 4.NF.3b, 4.NF.3d);
- Learn multiple strategies to add mixed number with like denominators (4.NF.1, 4.NF.3, 4.NF.3a, 4.NF.3b, 4.NF.3c, 4.NF.3d);
- Add unlike fractions with tenths and hundredths (4.NF.1, 4.NF.3, 4.NF.3a, 4.NF.5, 4.NF.6);
- Divide an area of land into parts based on a number story and write a fraction addition equation to represent partitioning (4.NF.3, 4.NF.3a, 4.NF.3b);
- Subtract fractions of the same whole with like denominators to solve number stories (4.NF.3, 4.NF.3a, 4.NF.3b, 4.NF.3d, 4.MD.2);
- Subtract mixed numbers by writing equations, drawing diagrams, and solving number stories, (4.NF.3, 4.NF.3a, 4.NF.3b, 4.NF.3c, 4.NF.3d);
- Record data on a line plot and answer questions regarding the data (4.NF.3, 4.NF.3c, 4.MD.4);
- Explore rotation, iteration of measurement units and angle measures (4.MD.5, 4.MD.5a, 4.MD.5b, 4.G.1);
- Identify the degree as a unit of measurement for angles (4.MD.5, 4.MD.5a, 4.MD.5b, 4.G.1);
- Review line symmetry and explore properties of symmetric shapes (4.G.3);
- Solve multistep multiplication number stories and express their solution strategies with appropriate units and number models (4.OA.3, 4.NBT.3, 4.NBT.4, 4.NBT.5)

Interdisciplinary Standards (njcccs.org)

- Standard 9.1 - Century Life & Career Skills
- Standard 9.3 - Career Awareness, Exploration, and Preparation
- Standard 8.2 - Technology Education
- Standard 6.3 - Active Citizenship in the 21st century

Activities – include 21st Century Technologies:

- Compose and decompose fractions using fraction circles
- Use paper plates to create an angle maker;

- Use colored blocks or tiles to build different rectangles;
- Use pattern blocks to create fraction of a whole;
- Use base ten blocks to model adding and subtracting fractions;
- Write unique fractions number stories;
- Create line plots on the computer;
- Use create unique shapes to explore symmetry;
- Use paper and straw to create a clock and relate it to angle measurements on a circle;
- Solve multistep problems

- Games
 Multiplication Top-It;
 Fraction Match;
 Decimal Top-It;
 Multiplication Wrestling;
 Fraction/Decimal Concentration;
 Fishing for Fractions Addition;
 Fraction Top-It;
 Fishing for Fractions Subtraction.

Enrichment Activities:

- Fraction Tangrams;
- Finding the whole of a candy bar;
- Investigate Egyptian fractions;
- Add and subtract fractions with unlike denominators;
- Use coins to add fractions;
- Write fraction number stories;
- Subtraction mixed numbers with unlike denominators;
- Clock Angles;
- Solve pattern block riddles;
- Write multistep number stories.

Methods of Assessments/Evaluation:

- Unit Assessment
- Exit Slips
- Study Island
- Thumbs Up/Thumbs Down
- Pair/Share
- Math Boxes
- Manipulatives
- Observation (Teacher/Small/Whole Group)
- Center Activities
- Math Journal
- Self-Assessments
- Whiteboards

- Weekly Assessments
- Homework
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- Independent Work
- Real World Apps
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- Open Ended Questions
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Resources/Including Online Resources

- Online Textbook
- Teacher Webpage
- Everyday Mathematics Online
- Khan Academy
- IXL
- Study Island
- XtraMath

Topic/Unit: Unit 6: Division; Angles

Approximate # Of Weeks: 4.5 Weeks

Essential Questions:

- **What is the relationship between multiplication and division?**
- **How do we measure angles?**
- **How do we construct angles?**

Upon completion of this unit students will be able to:

- Find a rule for solving extended division facts (4.OA.4, 4.NBT.1, 4.NBT.5, 4.NBT.6);
- Find the missing side lengths of rectangles (4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MD.3);
- Solve division number stories using familiar multiples (4.OA.4, 4.NBT.5, 4.NBT.6);
- Explore dividing multidigit number into parts as a method for division (4.NBT.3, 4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MD.3);
- Interpret remainders to decide how to package fruit for a fundraiser (4.OA.3, 4.NBT.6);
- Explore U.S. customary units of weight and convert tons to pounds and pounds and ounces (4.NBT.5, 4.Md.1, 4.MD.2);
- Use partial-quotient division to divide whole numbers with 3- and 4-digit dividends (4.OA.4, 4.NBT.2, 4.NBT.3, 4.NBT.4 4.NBT.6);
- Explore different ways to express and interpret remainders (4OA.3, 4.NBT.6);
- Create a tool to measure angles (4.MD.5, 4.MD.5a, 4.MD.5b, 4.MD.6, 4.G.1);
- Measure angles with a half circle protractor (4.NBT.4, 4.MD.5, 4.MD.5a, 4.MD.5b, 4.MD.6, 4.MN.7, 4.G.1);
- Add and subtract fractions and mixed numbers with like denominators to solve number stories (4.NF.3, 4.NF.3a, 4.NF.3b, 4.NF.3c, 4.NF.3d, 4.MD.1, 4.MD.2);
- Use understanding of whole number multiplication to multiply fractions by whole numbers (4.NBT.5, 4.NF.4, 4.NF.4b, 4.NF.4c)

Interdisciplinary Standards (njcccs.org)

- Standard 6.3- Active Citizenship in the 21st Century
- Standard 8.1- Computer and Information Literacy
- Standard 9.1 – 21st Century Life and Career Skills

Activities – include 21st Century Technologies:

- Examine fact triangle relationships;
- Find garden plot dimensions;
- Last factor pairs;
- Use the partition method for division;

- Explore remainders while reading Remainder of One by Elinor J. Pinczes;
- Use straws, twist ties, string or masking tape, yardstick or meterstick to explore rotation;
- Model angles with rope;
- Order weights;
- Put angles together using half circle protractors and scissor glue and tape;
- Use fraction circles to decompose and compose numbers;
- Draw pictures /diagrams to solve number stories.
- Games
 - Divide and Conquer;
 - Rugs and Fences;
 - Multiplication Wrestling;
 - Fishing for Fractions (Mixed-Number Subtraction);
 - Fraction Top it;
 - Fraction Match;
 - Division Dash;
 - Angle Race;
 - How Much More;
 - Decimal Top-It;
 - Angle Add-Up.

Enrichment Activities:

- Sort a bag of numbers using estimation skills;
- Explore multiple combinations of perimeter and area;
- Find factor pairs of a number in the thousands;
- Solve ring riddles;
- Convert between ounces, pounds, and tons;
- Perform a math magic trick;
- Solve and create number stories;
- Extend understanding of benchmark angles to solve geometric units;
- Read Sir Cumference and the Great Knight of Angleland by Cindy Neuschwander;
- Find the sum of a triangle's angles;
- Solve complex number stories using grids.

Methods of Assessments/Evaluation:

- Unit Assessment
- Exit Slips
- Study Island
- Thumbs Up/Thumbs Down
- Pair/Share

- Math Boxes
- Manipulatives
- Observation (Teacher/Small/Whole Group)
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Topic/Unit: Unit 7: Multiplication of a Fraction by a Whole Number; Measurement

Approximate # Of Weeks: 4.5 Weeks

Essential Questions:

- **How do we multiply fractions by a whole number?**
- **How to do we use knowledge of multiply fractions to solve real world scenarios?**

Upon completion of this unit students will be able to:

- Convert between cups, pints, quarts, and gallons (4.NBT.4, 4.NBT.5, 4.NBT.6, 4.MD.1, 4.MD.2);
- Multiply unit and non-unit fractions by whole numbers (4.OA.2, 4.NF.2, 4.NF.3, 4.NF.3a, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.MD.1, 4.MD.2);
- Represent fraction as multiple of a unit fraction (4.NF.4, 4.NF.4a, 4.NF.4b, 4.NF.4c);
- Multiply fractions by whole numbers (4.NF.4, 4.NF.4a, 4.NF.4b, 4.NF.4c);
- Multiply mixed numbers by whole numbers (4.NF.3, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.MD.1, 4.MD.2);
- Use fraction tools to create fruit salads (4.NF.3, 4.NF.3a, 4.NF.3d, 4.NF.4, 4.NF.4b, 4.NF.4c);
- Estimate, find, and assess the reasonableness of answers to multistep division number stories (4.OA.3, 4.NBT.4, 4.NBT.6);
- Use division strategies to solve various measurements problems (4.NBT.5, 4.NBT.6, 4.MD.1, 4.MD.2);
- Generate and analyze patterns in rectangular numbers (4.OA.4, 4.NBT.6, 4.MD.3);
- Solve multistep number stories involving fractions (4.NF.2, 4.NF.3, 4.NF.3a, 4.NF.3c, 4.NF.4b, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.MD.1, 4.MD.2);
- Multiply and add fraction weights of state birds (4.NF.3, 4.NF.3c, 4.NF.3d, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.NF.6, 4.MD.2);
- Convert between fractions and decimals to solve number stories (4.OA.3, 4.NF.3, 4.NF.3a, 4.NF.3c, 4.NF.3d, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.NF.6, 4.MD.2);
- Record data on a line plot and answer questions regarding data (4.NF.1, 4.NF.2, 4.NF.3, 4.NF.3a, 4.NF.3c, 4.MD.4)

Interdisciplinary Standards (njcccs.org)

- Standard 6.3- Active Citizenship in the 21st Century
- Standard 8.1- Computer and Information Literacy
- Standard 9.1 – 21st Century Life and Career Skills

Activities – include 21st Century Technologies:

- Create a liquid volume figure;

- Use measuring cups and spoons to measure water, soup, and salt;
- Skip count by unit fractions;
- Multiply and add fractions using fraction circles/models;
- Measure various objects using lengths of string and meter sticks;
- Find patterns within pictures;
- Compute fractions of hours using clocks;
- Convert between pounds and ounces;
- Translate decimals/fractions using money;
- Create a line plot from throwing paper airplanes
- Games
 - Fishing for fractions (Subtraction);
 - Multiplication Wrestling;
 - Angle Tangle;
 - Divide and Conquer;
 - Fraction Multiplication Top-it;
 - Fishing for Fractions (Addition);
 - Decimal Top-It;
 - Angle Add-Up.

Enrichment Activities:

- Convert between liquid measurements;
- Cooking for one activity;
- Write missing groups number stories;
- Jumping Frogs and Leaping Lizzards activity;
- Build rectangular pyramids;
- Create number stories and trade with partners;
- Apply conversion of ounces to real life scenarios;
- Create goodie bags for a party;
- Plot straw lengths.

Methods of Assessments/Evaluation:

- Unit Assessment
- Exit Slips
- Study Island
- Thumbs Up/Thumbs Down
- Pair/Share
- Math Boxes
- Manipulatives
- Observation (Teacher/Small/Whole Group)
- Center Activities
- Math Journal
- Self-Assessments
- Whiteboards
- Weekly Assessments

- Homework
- Class work
- Independent Work
- Real World Apps
- Journal Reflective
- Open Ended Questions
- Verbal Assessment
- Rhetorical Questions
- Projects

Resources/Including Online Resources

- Online Textbook
- Teacher Webpage
- Everyday Mathematics Online
- Khan Academy
- IXL
- Study Island
- XtraMath

Topic/Unit: Unit 8: Fraction Operations; Application

Approximate # Of Weeks: 4.5 Weeks

Essential Questions:

- What are fractions?
- How are fractions, number concepts, patterns and geometry applicable in real-world scenarios?

Upon completion of this unit students will be able to:

- Solve challenging multistep number stories (4.OA.3, 4.NBT.4, 4.NBT.5, 4.NBT.6);
- Apply understanding of additive nature of angle measures to real life situations (4.NBT.4, 4.MD.6, 4.MD.7, 4.G.1)
- Find measures of pattern-block angles and use known angle measures to find measures of other angles (4.NBT.4, 4.MD.7);
- Apply knowledge of line symmetry to create symmetric shapes and quilting patterns (4.G.3)
- Make line plots and add and subtract mixed numbers to answer questions regarding data (4.NF.3, 4.NF.3c, 4.NF.3d, 4.MD.2, 4.MD.3, 4.MD.4);
- Compute with fractions and mixed numbers as they apply a perimeter formula for rectangles in real world and mathematical problems (4.NF.3, 4.NF.3a, 4.NF.3c, 4.NF.3d, 4.NF.4, 4.NF.4b, 4.MD.2, 4.MD.3);
- Solve number stories by converting decimals to fractions (4.NF.4, 4.NF.4b, 4.NF.4c, 4.NF.5, 4.NF.6, 4.MD.1, 4.MD.2, 4.MD.3, 4.G.1, 4.G.3);
- Find the area of rectangles using fractions and mixed numbers (4.NF.3, 4.NF.3c, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.MD.2, 4.MD.3, 4.G.1, 4.G.3)
- Multiply fractions by whole numbers to solve number stories (4.OA.3, 4.NBT.5, 4.NF.2, 4.NF.3, 4.NF.3d, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.MD.1, 4.MD.2, 4.MD.3);
- Convert liquid measurements and solve problems involving fractions (4.NF.2, 4.NF.3, 4.NF.3c, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.MD.1, 4.MD.2);
- Solve problems with fractions and conversion of units of measure (4.NF.2, 4.NF.3, 4.NF.3d, 4.NF.4, 4.NF.4b, 4.NF.4c, 4.MD.1, 4.MD.2);
- Use place value and properties of operations to solve puzzles (4.NBT.4);
- Find equivalent names for numbers (4.NBT.4, 4.NBT.5, 4.NBT.6, 4.NF.1, 4.NF.3, 4.NF.3b, 4.NF.3c, 4.NF.4, 4.NF.4a, 4.NF.4b, 4.NF.5, 4.NF.6)

Interdisciplinary Standards (njcccs.org)

- Standard 6.3- Active Citizenship in the 21st Century
- Standard 8.1- Computer and Information Literacy
- Standard 9.1 – 21st Century Life and Career Skills

Activities – include 21st Century Technologies:

- Solve Multistep number stories;
- Measure baseball angles;
- Create angles with pattern blocks;
- Create symmetrical patterns;
- Measure lines to the nearest $\frac{1}{8}$ of an inch;
- Use geoboards to find perimeter;
- Convert and add tenths and hundredths;
- Solve Olympic themed number stories;
- Find areas of shapes;
- Solve multistep number stories;
- Draw diagrams to show liquid measurement;
- Review subtraction and addition algorithms;

- Games
 - Fishing for fractions (Subtraction, Mixed-Number Addition, Mixed-Number Subtraction)
 - Angle Add Up
 - Fraction Multiplication Top-It
 - Multiplication Wrestling
 - Name that Number

Enrichment Activities:

- Write and solve multistep number stories with different operations;
- Compare zoo admissions;
- Find angles of a fraction circle piece;
- Create a quilt with symmetry;
- Rotate shapes and find symmetry;
- Create line plots from measurement data;
- Find possible dimensions of rectangles with a given perimeter;
- Design a baseball cap rack;
- Convert between units of liquid measurement;
- Explore relationship between pounds and ounces;
- Create student generated cryptarithms;
- Reach a target number writing various equations

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