Readington Township Public Schools

Grade 3 Honors Math

Authored by: Amy Kokoszka, Melissa Truempy,
and Kristi Dauernheim

Reviewed by: Sarah Pauch
Supervisor of Math, Science, and Technology

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Readington Township Public Schools
Whitehouse Station, NJ 08889
www.readington.k12.nj.us

Grade 3 Honors Mathematics

Overview

Readington Township Public Schools' K-5 mathematics curriculum provides students with a strong foundation in mathematics content while promoting and instilling the skills of problem solving, communication in mathematics, making mathematical connections, and reasoning. Throughout the delivery of the K-5 mathematics program, various tools and technology are employed, including manipulatives, calculators, software, apps, videos, websites, and computing devices (computers, tablets, smart phones, interactive whiteboards, etc.). A strong focus of the program on promoting high levels of mathematical thought through experiences which extend beyond traditional computation.

The Third Grade Honors course is a full-year course designed to provide advanced level mathematics instruction to select students who exhibit a demonstrated need to increase content knowledge in mathematics while accelerating the pace of instruction. The course was created with the goal of further developing strong, cogent mathematical thinking, and independent mathematical problem solving skills.

The program is directly correlated to the third and fourth grade New Jersey Student Learning Standards (NJSLS), and is designed to cover such topics as Operations and Algebraic Thinking, Number and Operations in Base Ten and with fractions, Measurement and Data, Geometry, and Mathematical Practices.

STUDENT OUTCOMES

(Linked to Jersey Student Learning Standards for Mathematics 2023)

Operations And Algebraic Thinking (3.OA)

A. Represent and solve problems involving multiplication and division

1. Interpret products of whole numbers, e.g., interpret 5x7 as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as 5x7.
2. Interpret whole-number quotients of whole numbers, e.g., interpret 56÷ 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 and/or represent a context in which a number of shares or a number of groups can be expressed as 56÷ 8.
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.1
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 8x? =48 , 5= ?÷ 3, 6x 6 =? .

B. Understand properties of multiplication and the relationship between multiplication and division

5 Apply properties of operations as strategies to multiply and divide. Examples: If 6 x4 =24 is known, then 4x 6 =24 = is also known. (Commutative property of multiplication.) 3x 5x 2 can be found by 3x 5= 15 , then 15x 2 =30 , or by 5x 2 =10, then 3 x10= 30. (Associative property of multiplication.) Knowing that 8 × 5= 40 and 8 × 2= 16, one can find 8 × 7 as 8x (5+ 2)= (8x 5)+ (8x 2)= 40 +16= 56 (Distributive property.) {Clarification: Students need not use formal terms for these properties).

6 Understand division as an unknown-factor problem. For example, find 32÷ 8 by finding the number that makes 32 when multiplied by 8.

C. Multiply and divide within 100

7. With accuracy and efficiency, multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8x 5= 40, one knows 40÷ 5= 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

D. Solve problems involving the four operations, and identify and explain patterns in arithmetic

8. Solve two-step word problems, including problems involving money, using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (Clarification: This standard is limited to problems posed with whole numbers and having whole number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order) (Order of Operations)
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.

Operations And Algebraic Thinking (4.OA)

A. **Use the four operations with whole numbers to solve problems**

1. Interpret a multiplication equation as a comparison, e.g., interpret 35 5 7 = as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
3. Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

B. Gain familiarity with factors and multiples

4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

C. Generate and analyze patterns

5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

Numbers and Operations in Base Ten (3.NBT)

A. **Use place value understanding and properties of operations to perform multi-digit arithmetic**

1. Use place value understanding to round whole numbers to the nearest 10 or 100.
2. With accuracy and efficiency, 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. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., ,) using strategies based on place value and properties of operations.

Number And Operations In Base Ten (4.NBT)

A. Generalize place value understanding for multi-digit whole numbers.

1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.
2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
3. Use place value understanding to round multi-digit whole numbers to any place.

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

4. With accuracy and efficiency, add and subtract multi-digit whole numbers using the standard algorithm.

5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area model.

Number and Operations - Fractions (3.NF)

A. D**evelop understanding of fractions as numbers**

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 . For example: If a rectangle (i.e. the whole) is partitioned into 3 equal parts, each part is 1/ 3. Two of those parts would be 2/ 3 .
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. For example, partition the number line from 0 to 1 into 3 equal parts, represent 1/ 3 on the number line and show that each part has a size 1/ 3
    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. 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. Understand two fractions as equivalent if they are located at the same point on a number line.
    b. Recognize and generate simple equivalent fractions by reasoning about their size, (e.g., 1/ 2= 2/ 4, 4/6 = 2/3). Explain why the fractions are equivalent with the support of 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 on 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 with the support of a visual fraction model.
    e.

Number And Operations—fractions (4.NF)

A. Extend understanding of fraction equivalence and ordering

1. Explain why a fraction a/b is equivalent to a fraction (nxa)/nxb) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Measurement (3.M)

A. Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects

6 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.

6 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.

B. Geometric measurement: understand concepts of area and relate area to multiplication and to addition

3 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.

4 Measure areas by counting unit squares (square cm, square m, square in, square ft, and nonstandard units).

5 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 ax b and ax 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.

C. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures

6 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.

Measurement (4.M)

A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

1. Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*
2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

B. Geometric measurement: understand concepts of angle and measure angles.

4. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
    a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360th of a circle is called a "one-degree angle," and can be used to measure angles.
    b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
5. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
6. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Data Literacy (3.DL)

A. Understand data-based questions and data collection.

1. Develop data-based questions and decide what data will answer the question. (e.g. "What size shoe does a 3rd grader wear?", "How many books does a 3rd grader read?")
2. Collect student-centered data (e.g. collect data on students' favorite ice cream flavor) or use existing data to answer data-based questions.

B. Represent and interpret data

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.

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.

Data Literacy (4.DL)

A. Organize data and understand data visualizations

1. Create data-based questions, generate ideas based on the questions, and then refine the questions.
2. Develop strategies to collect various types of data and organize data digitally.
3. Understand that subsets of data can be selected and analyzed for a particular purpose.
4. Analyze visualizations of a single data set, share explanations and draw conclusions that the data supports.

B. Represent and interpret measurement data

5 Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Geometry (3.G)

A. Reason with shapes and their attributes

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.
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 1/4 of the area of the shape.

Geometry (4.G)

A. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Strategies

- Teacher presentation
- Teacher read-aloud
- Group discussion
- Small Group instruction
- Group presentations
- Interactive Smartboard Lessons
- Partner work
- Museum walks
- Math talk (students explain their thinking)
- Small Group Work
- Daily 5 Math
- Centers/ stations

Accommodations

Accommodations and Modification Addendum

Assessments

Formative	Summative
• Independent student work • Ready Classroom Lesson Quizzes • Teacher Observations • Class Participation • Class Discussions • Class Assignments • Homework Assignments • Notebooks • Anecdotal Records	• Mid-Unit Test • Unit Test
Benchmark	**Alternative**

• I-Ready Diagnostic • Performance Assessments	• Live Online Assessment Tools (Kahoot, Brainpop) • Student Projects • Student Presentations • Self-Assessments

Resources	
Required/Primary	**Supplemental**

• Ready Classroom Mathematics, Curriculum Associates, LLC
  ○ Teacher Manual Volumes 1 & 2
  ○ Student Books Volumes 1 & 2
  ○ Ready Classroom Teacher Toolbox
	• Brain Pop
	• IXL
	• Reflex Math
	• Online Tutorials (Learnzillion, Khan Academy, Math Antics)
	• Online Math Games (Math is Fun, Funbrain, Cool Math Games, Math Playground)
	• Illustrative Mathematics (www.illustratviemathematics.org)
	• Explore Learning Gizmos
	• Estimation 180

Essential Questions And Content

OPERATIONS AND ALGEBRAIC THINKING

Foundations in Multiplication

- How are multiplication and addition related?
- How can patterns and models help me to understand and represent basic multiplication?
- How can I relate what I know about skip counting to help me learn the multiples of 2,5,10?

Multi-Digit Multiplication

- What are some strategies for multiplying large numbers and how do they work?
- What makes one strategy or algorithm better than another?
- How does place value affect the accuracy of an estimate?
- What information do I need to know to solve a problem?

Division

- How are multiplication and division related?
- How can I use what I know about repeated subtraction, equal sharing, and forming equal groups to solve division problems?
- How can I use the relationship between multiplication and division to learn my basic facts?
- How can patterns and modelling help me to understand and represent basic division facts?

Equations, Word Problems, Factors and Prime Numbers

- What information and strategies would you use to solve a multi-step word problem?
- When should you use mental computation?
- How do you know if a number is divisible by 2, 3, 5, and 10?
- How can multiples be used to solve problems?
- How can a number be broken down into its smallest factors?
- How do you find the prime factors and multiples of a number?
- How does my knowledge about multiplication facts help me to solve problems?
- What are keywords and how do they give me clues to solve a problem?
- What are the different strategies I can use to organize information in a complex, multi-step word problem?
- What is the most appropriate way of communicating a mathematical idea in a particular situation?
- How can I explain my thinking in a clear, concise response?

NUMBERS AND OPERATIONS IN BASE TEN

Using Place Value to solve Multi-Digit Addition and Subtraction Problems

- How can place value models help represent different numbers?
- How do place value models represent the procedures of a standard algorithm?
- How can I use what I know about number relationships to develop efficient strategies for adding/subtracting multi-digit numbers?
- What makes a good estimate?

- Why is rounding used and what are some strategies I can use to round accurately?
- How can I use models, words and expanded formats to order and compare numbers?
- What are variables and when should I use them?

NUMBER AND OPERATIONS - FRACTIONS

Basic Fractions

- Where do I find fractions in my life?
- What does whole mean?
- What are the parts of a fraction and what do they represent?
- What does it mean to have equivalent fractions?
- How can I know if one fraction has more value than another?
- What is a good representation of adding and subtracting fractions with the same denominator?
- How do I identify and record the fraction of a whole or group?
- How do I use concrete materials and drawings to understand and show understanding of fractions?
- How do I explain the meaning of a fraction and its numerator and denominator, and use my understanding to represent values and solve problems?

Advanced Fractions and Decimals

- How can models be used to compute fractions with like and unlike denominators?
- How can models help us understand the addition and subtraction of decimals?
- How many ways can we use models to determine and compare equivalent fractions?
- How can I make and use a line plot to represent data involving fractions?
- What are some methods for carrying out operations with fractions?

MEASUREMENT

Measurement

- What am I measuring when I measure an angle?
- Why doesn't the measure of the angle change as I move along the rays of the angle?
- Why is it helpful to classify things like angles or shapes?
- How do I use weight and measurement in my life?
- What tools and units are used to measure?
- How are the units of measure within a standard system related?
- How do I decide which unit of measurement to use?
- How could estimation help with measurement?
- How do I choose the appropriate tool and unit when measuring?

Perimeter, and Area and Polygons

- How can patterns be used to determine standard formulas for area and perimeter?
- When would do people use perimeter and area in real life?
- How do you find perimeter, area, and volume of geometric figures?
- How are linear units different than square units?
- Why do shapes with the same perimeter have different areas?

DATA LITERACY

Pictographs, bar graphs, and Line Plots

- When solving multi-step word problems using charts, tables, and graphs, how can you tell if the information is sufficient?
- How can you collect, organize, and display data?
- How do you interpret the data you have collected?
- How do charts, tables, and graphs help you interpret data?
- How does the type of data influence the choice of graph?
- What kinds of questions can be answered using different data displays?
- In what ways can sets of data be represented by statistical measures?
- What data display is appropriate for a given set of data?
- Why are graphs helpful?

- What is the purpose of using line plots and how are they constructed?
- How can range, mean, median, and mode be computed and compared?

GEOMETRY

Reason with shapes and their attributes

- How can I identify and construct rays, angles, lines and points?
- What is the difference between a point, ray, line, line segment?
- How are angles measured?
- How are angles and sides used to classify triangles?
- What are some strategies I can use to find unknown angles in triangles?
- How can I demonstrate my understanding of parallel and perpendicular figures?
- How can I put shapes together and take them apart to form other shapes?

Pacing and Interdisciplinary Connections

Three-Digit Numbers: Place Value, Addition, and Subtraction

Lessons 0-3 (25 Days)

- Understand Place Value
- Use Place Value to Round Numbers
- Add Three-Digit Numbers
- Subtract Three-Digit Numbers
- Compare Whole Numbers

Interdisciplinary Connections:

- **RI.CR.3.1.** Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis or the answers.
  3.NBT.A.1. Use place value understanding to round whole numbers to the nearest 10 or 100.
  Activity: Read, *Sir Cumference and All the King's Tens* by Cindy Neuschwander to introduce the concept of rounding using the understanding of place value. Have the students use dominoes to place on a place value chart. Add the dots on the dominoes to create a digit in each place value on the chart; hundreds, tens, and ones. The students will then round the number they created to the nearest hundred and ten.

Multiplication and Division: Concepts, Relationships, and Patterns

Lessons 4-13 (52 days)

- Understand the Meaning of Multiplication
- Multiply with 0, 1, 2, 5, and 10
- Multiply with 3, 4, and 6
- Multiply with 7, 8, and 9
- Use Order and Grouping to Multiply
- Understand the Meaning of Division
- Understand How Multiplication and Division are Connected
- Multiplication and Division Facts
- Multiplication and Division in Word Problems
- Multiples and Factors
- Multiply by One-Digit Numbers
- Multiply by Two-Digit Numbers
- Use Multiplication to Convert Measurements
- Divide Three-Digit Numbers
- Divide Four-Digit Numbers
- Number and Shape Patterns
- Model and Solve Multi-Step Problems

Interdisciplinary Connections:

- **RI.CR.3.1.** Ask and answer questions, and make relevant connections to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

3.OA. A.1. Interpret products of whole numbers

Activity: Read, Amanda Bean's Amazing Dream by Cindy Neuschwander to introduce the concept of multiplication. Have the students begin a multiplication flipbook to model the different ways to visually show multiplication.

Multiplication: Finding Area, Solving Word Problems, and Using Scaled Graphs

Lessons 14-19 (30 days)

- Understand Area
- Multiply to Find Area
- Add Areas
- Solve One-Step Word Problems using Multiplication and Division
- Solve Two-Step Word Problems Using the Four Operations
- Scaled Graphs

Interdisciplinary Connections:

- **SL.AS.3.6** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

  3.OA.D.8 Solve problems involving the four operations and identify and explain patterns in arithmetic.

  Activity: Students will create word problems with one or two steps. Students will read their problems aloud to a partner to solve. Partners will explain their thinking and/or strategy.

Fractions: Equivalences and Comparison, Measurement, and Data

Lessons 20-26 (35 days)

- Understand What a Fraction Is
- Understand Fractions on a Number Line
- Understand Equlivalent Fractions
- Find Equivalent Fractions
- Understand Comparing Fractions
- Use Symbols to Compare Fractions
- Understand Fraction Addition and Subtraction
- Measure Length and Plot Data on Line Plots

Interdisciplinary Connections:

- **3-PS2-2.** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

  3.DL.B.4 Represent and interpret data. 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.

  Activity: Students will measure force of motion using magnets. They will look for patterns in data to predict how far the magnetic field extends around two magnets. Students collect data for one and three magnets, measuring the distance at which paper clips are attracted. They use those data to predict how far the magnetic field extends around two magnets. Students use and discuss science practices in the context of investigating magnetic fields.
- **3-LS1-1.** Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

  3.NF.A.2. Develop an understanding of fractions as numbers.

  Activity: Students examine germinated seeds to determine similarities and differences in the way the organisms grow. They set up a hydroponic garden to observe the life cycle of a bean plant. Students go outdoors to investigate the roots and shoots of various plants. They use tools to dig up plants and compare the structures above ground to those below ground. Growth should be measured and recorded in lengths to the nearest quarter inch.

- **3-PS2-2.** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

  3.DL.B.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.

  Activity: Students will design and test carts to see which type of cart rolls farther down a ramp. Students will use tape measures to measure the distance of each roll. Students will make modifications to their carts to improve on the cart's ability to travel.

Measurement: Time, Liquid Volume, and Mass

Lessons 27-29 (16 days)

- Time
- Liquid Volume
- Mass

Interdisciplinary Connections:

- **SL.AS.3.6** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

  3M.A.1 Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

  Activity: Students will create word problems involving time to the minute and/or intervals. Students will read their problems aloud to a partner to solve. Partners will explain their thinking and/or strategy.

Shapes: Attributes and Categories, Perimeter and Area, and Partitioning

Lessons 30-33 (18 days)

- Understand categories of Shapes
- Classify Quadrilaterals
- Area and Perimeter of Shapes
- Partition Shapes into Parts with Equal Areas
- Points, Lines, Rays, and Angles
- Angles
- Add and Subtract with Angles
- Classify Two-Dimensional Figures
- Symmetry

Interdisciplinary Connections:

- **W.IW.3.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

  3.G.A.1 Reason with shapes and their attributes. 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.

  Activity: Read **The Greedy Triangle** by Marilyn Burns. Create a worksheet that uses the shapes encountered in the story and incorporates perimeter. You may add a bonus section for the area of a quadrilateral. On the back, students will draw their own Greedy Triangle, give it side lengths, and find its perimeter based on the side lengths they decided upon. They will then draw a picture of their triangle doing its favorite activity and write a short description of what they have drawn.

Career, Computer Science, and Key Skills

Number And Operations In Base Ten

- **Career Ready Practices**
  Attend to personal health and financial well-being.

3. NBT A. Use place value understanding and properties of operations to perform multi-digit arithmetic.1**.** Use place value understanding to round whole numbers to the nearest 10 or 100. 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.

Activity: Students will be given one million dollars to spend on items such as college education/trade school, vacation, home purchase, car purchase, pet, charitable donations, clothing, etc. They are to subtract the researched costs of the items to determine who has the lowest total remaining in the class.

- **9.2 Career Awareness, Exploration, and Preparation**

  9.2.5.CAP.2: Identify how you might like to earn an income.

  3.NBT.A. Use place value understanding and properties of operations to perform multi-digit arithmetic. 1. Use place value understanding to round whole numbers to the nearest 10 or 100. 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.

  Activity: Students will be given a monthly budget based on various salary bands. They will use rounding and computation skills to estimate the cost of food, housing, education expenses, and miscellaneous. The challenge will be to stay within the budget and estimate the cost of living. Budgets will be based on several factors, including career choices and their annual salaries.

- **9.4 Life Literacies and Key Skills**

  9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.

  9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology.

  9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance.

  9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images, graphics, or symbols.

  3. NBT A. Use place value understanding and properties of operations to perform multi-digit arithmetic.1. Use place value understanding to round whole numbers to the nearest 10 or 100. 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.

  Activity: Students will be given a weekly allowance. They will also be given a weekly bill. Students will spend money of their choice as well. Students will use a digital platform to keep track of their budget.. Students will discuss the implications of running out of money. What are the consequences?

- **Computer Science**

  8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.

  3.NBT.A. Use place value understanding and properties of operations to perform multi-digit arithmetic. 1. Use place value understanding to round whole numbers to the nearest 10 or 100. 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.

  Activity: Utilize online computational resources to organize and represent the budget calculations based on monthly salaries, as stated in the activity above.

Operations And Algebraic Thinking

- **Career Ready Practices**

  Use technology to enhance productivity, increase collaboration and communicate effectively.

  3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

  Activity: Students will learn and practice multiplication and division facts by using district approved online programs and tools. Activities and games included in iReady and Reflex Math will be practiced daily to develop fact fluency and master memorization of facts.

- **9.2 Career Awareness, Exploration, and Preparation**

  9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.

  3.OA.A.3 Represent and solve problems involving multiplication and division. 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.
Activity: Students will brainstorm a list of jobs that require math skills.

- **9.4 Life Literacies and Key Skills**
  9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
  9.4.5.TL.5: Collaborate digitally to produce an artifact.
  9.4.5.IML.2: Create a visual representation to organize information about a problem or issue.
  3.OA.A.3 Represent and solve problems involving multiplication and division. 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.
  Activity: Students will digitally create new seating plans for a classroom using methods that show equal groups. Math drawings will be used to illustrate these groupings based on the different totals provided, up to 100. Coordinating equations will be written expressing the number of groups, number in each group, and the total.
- **Computer Science**
  8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
  3.OA.A.1-2 Represent and solve problems involving multiplication and division. 1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe and/or represent a context in which a total number of objects can be expressed as 5 × 7. 2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 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 and/or represent a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
  Activity: Students will create graphic representations of multiplication and division problems. Students will create a Google Doc or Slide to illustrate a related multiplication and division problem. These visual representations will demonstrate the process of each operation, and the thinking behind it, using either equal groups or an array.

Measurement

- **9.2 Career Awareness, Exploration, and Preparation**
  9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations.
  3.M.B.3 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.
  Activity: Have students design a dream home (architect, painter, carpenter, designer, engineer, homeowner, accountant) on graph paper, calculating the areas of each room in the house to find its total area. Calculate the areas of rooms to identify how much carpet, tile, wallpaper, paint is needed to decorate the rooms in the house.

- **Computer Science**
  8.2.5.ED.6: Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process.
  3.M.B.3 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.
  Activity: Have students design a dream home (architect, painter, carpenter, designer, engineer, homeowner, accountant) with various materials. , calculating the areas of each room in the house to find its total area. Calculate the areas of rooms to identify how much carpet, tile, wallpaper, paint is needed to decorate the rooms in the house.

Data Literacy

- **Career Ready Practices**
  Utilize critical thinking to make sense of problems and persevere in solving them.

3.DL.B.3 Represent and interpret data. 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.

Activity: Students will take a survey of their peers. Topics may include "favorite food", or "best pet". Based on the information collected, students will create a picture graph and bar graph. Students will then create original, data-based questions to be answered by a classmate. Vocabulary should include, but not be limited to, "how many more" and "how many less". Questions should be solved based on the graphs created.

- **9.4 Life Literacies and Key Skills**

  9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process.

  9.4.5.DC.1: Explain the need for and use of copyrights.

  9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data

  9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.

  3.DL.B.3 Represent and interpret data. 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

  Activity: Have students create various types of graphs (horizontal/vertical bar graphs, pictographs, pie charts, and line plots), using Google Sheets to represent a collection of data (Favorite Dr. Seuss book.)

Number And Operations-Fractions

- **Career Ready Practices**

  Utilize critical thinking to make sense of problems and persevere in solving them.

  3.NF.A.3 Develop an understanding of fractions as numbers. Explain the 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.

  Activity: Using pattern blocks, create a visual representation and model of equivalent fractions. Show the equivalencies by stacking the different shapes of blocks that fill the same amount of space. For example, two red trapezoids fill the same amount of space as one yellow hexagon and three blue rhombuses. Write the coordinating fractions. Show and explain to a partner how the pattern blocks show various examples of equivalent fractions.

- **9.2 Career Awareness, Exploration, and Preparation**

  9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., lifeguards, child care, medicine, education) and examples of these requirements.

  3.NF.A.2. Develop an understanding of fractions as numbers. 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.

  Activity: Equate finding fractions on a number line to measuring using a ruler (inches). Practice measuring various line lengths and/or objects and expressing the lengths using the appropriate fractions. Discuss the need to make precise measurements in career fields such as carpentry.

- **9.4 Life Literacies and Key Skills**

  9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

  9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images, graphics, or symbols.

  9.4.5.IML.2: Create a visual representation to organize information about a problem or issue.

  3.NF.A.3 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.

Activity: Students will create fraction problems using the symbols >, =, or <, and justify the conclusions.

- **Computer Science**

  8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.

  3.NF.A.1. Develop an understanding of fractions as numbers. 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 part of size 1/b.

  Activity: Students will choose a digital tool to create figures and partition them to show equal parts. Then write coordinating fractions. Show both "examples" and "non-examples". Explain your reasoning to show an understanding of equal parts of a whole.

Geometry

- **Career Ready Practices**

  Demonstrate creativity and innovation.

  3.G.A.2 Reason with shapes and their attributes. 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 1/4 of the area of the shape.

  Activity: Using grid paper and a straight edge, draw a rectangle. Decompose the shape, and find the area of each part. Then also find the total area. Next, shade parts of the rectangle and express the value as a fraction. Share findings with peers and explain your reasoning.

- **9.2 Career Awareness, Exploration, and Preparation**

  9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.

  3.G.A.1 Reason with shapes and their attributes. 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.

  Activity: Students will choose a career that relies, at least in part, on knowledge of shapes. For example, they may choose to be an architect or a baker. Using learned attributes of shapes, students will create a sketch or 3D project showcasing the importance of the attributes of various shapes. If choosing to be an architect, a student may build a model of a structure using pattern blocks. Afterward, identify what shapes worked well and made the structure stable, as well as what shapes did not and explore why this was the case.

- **9.4 Life Literacies and Key Skills**

  9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.

  9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action.

  9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and

  disadvantages of using each.

  3.G.A.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 1/4 of the area of the shape.

  Activity: Students will answer word problems that address personal, academic, and global problems that ask them to divide shapes appropriately.

- **Computer Science**

  8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.

3.G.A.1 Reason with shapes and their attributes. 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.

Activity: Students will sort shape cards into categories according to their attributes. Possible extensions will include a challenge to explain why several shapes fit into multiple categories. Identify patterns and similarities discovered while sorting. Create a graphic organizer that shows the categories, similarities, and differences.