

**TRUMBULL PUBLIC SCHOOLS**  
Trumbull, Connecticut

**Mathematics**  
**Grade 3**  
**2023**

**Curriculum Writing Team:**

<b>Michelle Bal</b>	<b>Math Specialist</b>
<b>Robyn Tedesco</b>	<b>Math Specialist</b>
<b>Maura Palermo</b>	<b>Grade 3 Teacher</b>
<b>Kim Lombardi</b>	<b>Program Leader Mathematics</b>

**Susan C. Iwanicki, Ed.D., Assistant Superintendent**

# **Grade 3 Mathematics**

## **Table of Contents**

Trumbull Core Values and Beliefs	2
Introduction	2
Philosophy	3
Goals	4
Trimester 1 & Vocabulary	5
Trimester 2 & Vocabulary	7
Trimester 3 & Vocabulary	9
Instructional Strategies/Primary Resource/Supplemental Resources	11
Supplementary Materials/ Websites	12
Connecticut Common Core Standards: Grade 3 Math Standards	13
Mathematical Practice Standards	16
Technology Competency Standards	16

The Trumbull Board of Education, as a matter of policy, prohibits discrimination on the grounds of age, creed, religion, sex, race, color, handicap, political affiliation, marital status, sexual orientation, or national origin.

## **TRUMBULL CORE VALUES AND BELIEFS**

Our mission states, “Trumbull Public Schools, in partnership with the community, strives to meet the educational needs of all students within a challenging and supportive academic environment that empowers each student to become a life-long learner and to live and participate in a democratic, diverse and global society.” Trumbull Public Schools believes in a shared, collaboratively created vision of success for all students in our district. We work throughout the year to ensure all instruction is in service of supporting students to achieve a shared vision of knowledge and skills.

- We believe that all individuals are capable of learning.
- We believe that all individuals should have the resources necessary to achieve success within a challenging curriculum.
- We believe that a family, school, and community partnership is essential to our success.
- We believe that a safe and orderly environment is critical to learning.
- We believe that there is strength in diversity and that all individuals are worthy of our respect and dignity.
- We believe that our school climate must be welcoming, caring, and supportive for all members of the learning community.
- We believe that a reflective evaluation of present practices and processes is necessary in order to plan for our future.

## **INTRODUCTION**

The Elementary Math Curriculum was last revised in 2023 and was aligned to the State of Connecticut Common Core State Standards (CCSS). It includes specific grade level expectations and resources appropriate for this grade, making it a teacher-friendly instructional guide for ease in delivery. Appropriate professional development will further aid in fidelity to the implementation of the CCSS and assured use of the resources provided for instruction.

Trumbull Elementary Schools will provide all students access to a rigorous mathematics curriculum that will prepare them for success in an ever changing global society. Our students will learn to use mathematical reasoning and critical thinking to problem solve and communicate. This curriculum will include strong number sense as a foundation. All students will develop a strong mathematical voice where they will be able to transfer and discuss their foundational skills to problem solving skills. Our educators will be supported through professional development, meaningful feedback and opportunities for collaboration.

## PHILOSOPHY

Success in mathematics depends upon active involvement in a variety of interrelated experiences. When students participate in stimulating learning opportunities, they can reach their full potential.

The Trumbull Mathematics Program embraces these goals for all students.

### **Successful mathematicians:**

- develop and demonstrate a balanced understanding of mathematics as conceptual, procedural, and application of skills.
- make meaningful mathematical connections to their world through peer collaboration.
- communicate effectively using mathematical terminology, both independently and collaboratively.
- solve problems utilizing a variety of strategies.
- utilize technology as a tool to enhance the problem solving process.
- use sound mathematical reasoning by utilizing the power of conjecture and proof in their thinking.
- become reflective thinkers through continuous self evaluation.
- become independent, self motivated, lifelong learners.
- engage in robust conversations and peer to peer interactions.
- demonstrate perseverance while building stamina when faced with challenging tasks.
- embody a growth mindset.
- take ownership and communicate their understanding and purpose of their learning.
- extend their learning beyond the classroom.

The Trumbull Mathematics Program promotes equity by setting high expectations with strong support for all math students in a differentiated environment. Students are empowered to embrace the skills needed to become successful in the 21st century. Students expand their mathematical abilities by investigating real world phenomena. Through such experiences, students make real world math connections and discover that math can have more than one method for achieving a correct answer and they can truly appreciate the impact math has on the world in which they live.

## **GOALS: Major Focus Areas for Grade 3 Mathematics**

1. Represent and solve problems involving multiplication and division
2. Understand properties of multiplication and the relationship between multiplication and division
3. Multiply & divide within 100
4. Solve problems involving the four operations, and identify & explain patterns in arithmetic
5. Develop understanding of fractions as numbers
6. Solve problems involving measurement and estimation of intervals of time, liquid volumes, & masses of objects
7. Geometric measurement: understand concepts of area and relate area to multiplication and to addition

## Grade 3 Mathematics: Trimester 1 (61 Days)

### Unit Name: Grade 3 Trimester 1

#### Content and Skills

**Mathematical Practices:** See Addendum

#### Quantity, Measurement, and Data:

- Measure liquid volumes and masses of objects using standard units of grams, kilograms, and liters.
- Estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters.
- Solve one-step word problems involving masses or liquid volumes given in the same units.
- Draw a scaled bar graph to represent a data set.
- Solve one and two-step *how many more* and *how many less* word problems using information presented in a scaled bar graph.

#### Numeration, Operations, and Algebraic Thinking:

##### Operations and Algebraic Thinking

- Represent a multiplication situation with a model and convert between several representations of multiplication.
- Represent a division situation with a model and convert between several representations of division.
- Solve one-step word problems by using multiplication and division within 100, involving factors and divisors 2-5 and 10.
- Determine the unknown number in a multiplication or division equations involving factors and divisors 2-5 and 10.
- Apply the commutative property of multiplication to multiply a factor of 2-5 or 10 by another factor.
- Apply the distributive property to multiply a factor of 2-5 or 10 by another factor.
- Represent and explain division as an unknown factor problem.
- Multiply and divide within 100 fluently with factors 2-5 and 10, recalling from memory all products of two 1-digit numbers.
- Solve two-step word problems.

##### Number and Operations in Base Ten

- Round whole numbers to the nearest ten and hundred.
- Add and subtraction within 1,000 fluently using strategies based on place value, properties of operations, or the relationship between addition and subtraction.

**Geometry:** N/A

**Essential Question(s):** Taken from the CCSS Mathematical Practices

- What is the problem asking? Does this make sense? (MP1)
- What do the numbers in the problem represent? (MP2)
- Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree? (MP3)
- Can I model my thinking using manipulatives, words, numbers or pictures? (MP4)
- What mathematical tools could we use to visualize and represent the situation? (MP5)
- Is my answer correct? How can I prove it mathematically? (MP6 and 7)
- What ideas that we have learned before were useful in solving this problem? (MP7)
- What is happening in this situation? (MP8)

**Focus Question(s):** These will be content specific (i.e. Explain how you arrived at an answer)

- Can you solve using a different strategy?
- Can you critique or agree with another person's strategy?

<b>Common Core State Standards for Mathematics</b> <i>(See Appendix for complete description)</i>	<b>Time Allotment</b>	<b>Assured Learner Activities</b>	<b>Assessment</b>
3.OA.1      3.NBT.1 3.OA.2      3.NBT.2 3.OA.3      3.MD.2 3.OA.4      3.MD.3 3.OA.5 3.OA.6 3.OA.7 3.OA.8	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<ul style="list-style-type: none"> <li>▪ Great Minds: Eureka Math<sup>2</sup></li> <li>▪ Fact fluency practice</li> </ul>	<ul style="list-style-type: none"> <li>▪ Eureka Math<sup>2</sup> Assessments</li> <li>▪ i-Ready Diagnostic Screener</li> <li>▪ Classroom mathematical discourse</li> </ul>
<b>Technology Competency Standards</b> <i>(See Appendix for complete description)</i>			
2. Communicate and Collaborate 4. Critical Thinking, Problem Solving, and Decision Making 5. Digital Citizenship			

**Vocabulary:**

**Module 1**  
**New:** Commutative Property of Multiplication, factor, multiply, multiply by, division, divide, divided by, parentheses, product, quotient, rotate, size of group  
**Familiar:** array, column, equal groups, equal shares, equal sharing, equation, estimate (noun), estimate (verb), expression, number in (or size of) each group, number of groups, repeated addition, row, skip-count, unit, unit form, unknown

**Module 2**  
**New:** capacity, gram, kilogram, liquid volume, liter, milliliter, operation, round, rounding, scaled bar graph, standard algorithm for addition and subtraction  
**Familiar:** about, addend, bar graph, benchmark, centimeters, comparative language: more than, less than, about the same, compose, decompose, divide, estimate (noun), estimate (verb), exchange, bundle, unbundle, rename, halfway, heavier, lighter, horizontal, interval, measure, mental math, meters, multiply, number line, place value units, plot, simplifying strategy, temperature, tick mark, vertical, weight  
**Academic Verbs:** determine, examine, locate

## Grade 3 Mathematics: Trimester 2 (60 Days)

### Unit Name: Grade 3 Mathematics: Trimester 2

#### Content and Skills

**Mathematical Practices:** See Addendum

#### Quantity, Measurement, and Data:

- Recognize that the opposite sides of rectangles have equal length and relate their side lengths to numbers of square tiles.
- Recognize that area can be measured by using unit squares and that a plain figure covered without gaps or overlaps by  $n$  unit squares has an area of  $n$  square units.
- Measure areas by counting unit squares including square centimeters, square meters, square inches, square feet, and improvised units.
- Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is equal to the product of the side lengths.
- Solve real world and mathematical problems involving areas of rectangles.
- Apply the distributive property to find areas of rectangles.
- Calculate areas of composite shapes.
- Solve word problems involving areas of composite shapes.

#### Numeration, Operations, and Algebraic Thinking:

##### Operations and Algebraic Thinking

- Represent a multiplication situation with a model and convert between several representations of multiplication.
- Represent a model with a multiplication situation.
- Represent a division situation with a model and convert between several representations of division.
- Represent a model with a division situation.
- Solve one-step word problems by using multiplication and division within 100, using a letter for the unknown number.
- Determine the unknown number in a multiplication or division equation.
- Apply the distributive property to multiply.
- Apply the distributive property to divide.
- Apply the associative property of multiplication.
- Represent and explain division as an unknown factor problem.
- Multiply and divide within 100 fluently recalling from memory all the products of two 1-digit numbers.
- Solve two-step word problems. Represent these problems using equations with a letter standing for the unknown. Assess the reasonableness of solutions.
- Identify and extend arithmetic patterns and explain them using properties of operations.

##### Number and Operations in Base Ten

- Multiply one-digit whole numbers by multiples of 10 in the range 10-90 using place value strategies and properties of operations.

#### Geometry:

- N/A

#### Essential Question(s): Taken from the CCSS Mathematical Practices

- What is the problem asking? Does this make sense? (MP1)
- What do the numbers in the problem represent? (MP2)
- Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree? (MP3)
- Can I model my thinking using manipulatives, words, numbers or pictures? (MP4)
- What mathematical tools could we use to visualize and represent the situation? (MP5)
- Is my answer correct? How can I prove it mathematically? (MP6 and 7)
- What ideas that we have learned before were useful in solving this problem? (MP7)
- What is happening in this situation? (MP8)

<p><b>Focus Question(s):</b> These will be content specific (i.e. Explain how you arrived at an answer)</p> <ul style="list-style-type: none"> <li>Can you solve using a different strategy?</li> <li>Can you critique or agree with another person's strategy?</li> </ul>				
<p><b>Common Core State Standards for Mathematics</b> <i>(See Appendix for complete description)</i></p>		<p><b>Time Allotment</b></p>	<p><b>Assured Learner Activities</b></p>	<p><b>Assessment</b></p>
<p>3.OA.1 3.OA.2 3.OA.3 3.OA.4 3.OA.5 3.OA.6 3.OA.7 3.OA.8 3.OA.9</p>	<p>3.NBT.3 3.MD.5 3.MD.6 3.MD.7 3.G.1</p>	<p>70 minutes daily per Trumbull Board of Education Policy # 6112.2</p>	<ul style="list-style-type: none"> <li>Great Minds: Eureka Math<sup>2</sup></li> <li>Fact fluency practice</li> </ul>	<ul style="list-style-type: none"> <li>Eureka Math<sup>2</sup> Assessments</li> <li>i-Ready Diagnostic Screener</li> <li>Classroom mathematical discourse</li> </ul>
<p><b>Technology Competency Standards</b> <i>(See Appendix for complete description)</i></p>				
<p>2. Communicate and Collaborate 4. Critical Thinking, Problem Solving, and Decision Making 5. Digital Citizenship</p>				

<p><b>Vocabulary:</b></p> <p><b>Module 3:</b>  <b>New:</b> multiple  <b>Academic Verb:</b> apply  <b>Familiar:</b> array, column, commutative property, distribute, division, divide, divided by, equal groups, equation, estimate (noun), estimate (verb), even number, expression, factor, multiplication, multiply, number bond, odd number, parentheses, product, quotient, row, skip-count, tape diagram, unit, unit form, unknown, value</p> <p><b>Module 4:</b>  <b>New:</b> area, area model, length, side length, square centimeter, square inch, square units, unit square, width  <b>Academic Verb:</b> observe  <b>Familiar:</b> array, attribute, break apart and distribute, line plot, parallel, polygon, quadrilateral, rectangle, right angle, square, trapezoid</p>
---

## Grade 3 Mathematics: Trimester 3 (60 Days)

### Unit Name: Grade 3 Mathematics: Trimester 3

#### Content and Skills

**Mathematical Practices:** See Addendum

#### Quantity, Measurement, and Data:

- Measure lengths by using rulers marked with halves and fourths of an inch and use the data to complete a line plot.
- Tell time to the nearest minute and measure time intervals in minutes.
- Solve word problems involving addition and subtraction of time intervals.
- Draw a scaled bar graph to represent a data set.
- Draw a scaled picture graph to represent a data set.
- Solve one and two-step *how many more* and *how many less* word problems using information presented in a scaled bar graph.
- Measure lengths by using rulers marked with halves and fourths of an inch and use the data to make a line plot.
- Solve real-world and mathematical problems involving perimeters of polygons.
- Exhibit rectangles that have the same perimeter and different areas or the same area and different perimeters.

#### Numeration, Operations, and Algebraic Thinking:

##### Operations and Algebraic Thinking

- N/A

##### Number and Operations in Base Ten

- N/A

##### Number and Operations – Fractions

- Represent a fraction  $1/b$  as the quantity formed by one part when a whole is partitioned into  $b$  equal parts.
- Represent a fraction  $a/b$  as the quantity formed by  $a$  parts of size  $1/b$ .
- Represent a fraction  $1/b$  on a number line by partitioning the interval from 0-1 into  $b$  equal parts.
- Represent a fraction  $a/b$  on a number line by partitioning the number line into intervals of length  $1/b$  starting from zero.
- Generate equivalent fractions by using a visual fraction model.
- Express whole numbers as fractions.
- Compare two fractions with the same numerator or the same denominator and justify the conclusion by using a visual fraction model.
- Explain that comparisons of two fractions are valid only when the fractions refer to the same whole.

#### Geometry:

- Partition shapes into parts with equal areas and express the area of each part as a unit fraction of a whole.
- Classify shapes by their attributes and identify shared attributes between shapes.
- Recognize and draw quadrilaterals.

#### Essential Question(s): Taken from the CCSS Mathematical Practices

- What is the problem asking? Does this make sense? (MP1)
- What do the numbers in the problem represent? (MP2)
- Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree? (MP3)
- Can I model my thinking using manipulatives, words, numbers or pictures? (MP4)
- What mathematical tools could we use to visualize and represent the situation? (MP5)
- Is my answer correct? How can I prove it mathematically? (MP6 and 7)
- What ideas that we have learned before were useful in solving this problem? (MP7)

<ul style="list-style-type: none"> <li>What is happening in this situation? (MP8)</li> </ul> <p><b>Focus Question(s):</b> These will be content specific (i.e. Explain how you arrived at an answer)</p> <ul style="list-style-type: none"> <li>Can you solve using a different strategy?</li> <li>Can you critique or agree with another person's strategy?</li> </ul>				
Common Core State Standards for Mathematics <i>(See Appendix for complete description)</i>		Time Allotment	Assured Learner Activities	Assessment
3.NF.1 3.NF.2 3.NF.3 3.MD.1 3.MD.3 3.MD.4 3.MD.8 3.G.1 3.G.2		70 minutes daily per Trumbull Board of Education Policy # 6112.2	<ul style="list-style-type: none"> <li>Great Minds: Eureka Math<sup>2</sup></li> <li>Fact fluency practice</li> </ul>	<ul style="list-style-type: none"> <li>Eureka Math<sup>2</sup> Assessments</li> <li>i-Ready Diagnostic Screener</li> <li>Classroom mathematical discourse</li> </ul>
Technology Competency Standards <i>(See Appendix for complete description)</i>				
2. Communicate and Collaborate 4. Critical Thinking, Problem Solving, and Decision Making 5. Digital Citizenship				

<p><b>Vocabulary:</b></p> <p><b>Module 5:</b>  <b>New:</b> eighths, equivalent, fifths, fraction form, fraction greater than 1, fractional unit, ninths, sixths, tenths, unit fraction  <b>Academic Verb:</b> identify  <b>Familiar:</b> equal parts, equal shares, fourths, fraction, half, halve, half of, one third of, one fourth of, line plot, number line, partition, plot, thirds, tick mark, unit form, whole, whole number</p> <p><b>Module 6:</b>  <b>New:</b> diagonal, measurement data, perimeter, regular polygon, scaled picture graph  <b>Academic Verb:</b> none  <b>Familiar:</b> analog clock, area, attribute, data, fraction, frequent, hexagon, key, line plot, octagon, parallel, parallelogram, pentagon, plot, polygon, quadrilateral, quarter past, quarter to, rectangle, rhombus, right angle, scale, scaled bar graph, square, survey, tangram, trapezoid</p>
---

## INSTRUCTIONAL STRATEGIES

*The curriculum writing team recognizes that these facilitation styles and routines are used in each unit. Within each unit is an outline for methods to reteach, support, and challenge all learners including multilingual.*

<b>Facilitation Styles</b>	<ul style="list-style-type: none"> <li>▪ Direct instruction</li> <li>▪ Guided instruction</li> <li>▪ Group work</li> <li>▪ Partner work</li> <li>▪ Independent practice</li> <li>▪ Formative and summative assessments</li> <li>▪ Brainstorm</li> </ul>
<b>Routines</b>	<ul style="list-style-type: none"> <li>▪ Sprints</li> <li>▪ Math Chat</li> <li>▪ Five Framing Questions</li> <li>▪ Always Sometimes Never</li> <li>▪ Co-Construction</li> <li>▪ Critique a Flawed Response</li> <li>▪ Numbered Heads</li> <li>▪ Stronger, Clearer Each Time</li> <li>▪ Take a Stand</li> <li>▪ Which One Doesn't Belong?</li> </ul>

### Primary Resource

<i>Title</i>	<i>Publisher</i>	<i>Date of Publication</i>
Eureka Math <sup>2</sup>	<i>Great Minds</i>	<i>2021</i>

### Supplemental Resources

<i>Title</i>	<i>Author</i>	<i>Publisher</i>	<i>Date of Publication</i>
<i>Investigation 2 Common Core Supplement</i>	<i>Susan Jo Russell Karen Economopoulos Keith Cochran</i>	<i>Scott Foresman</i>	<i>2012</i>
<i>Groundworks: Reasoning About Measurement</i>	<i>Dr. Carole Greenes Dr. Carol Findell Dr. Linda Schulman Dacey Dr. Rika Spungin</i>	<i>The Wright Group</i>	<i>2006</i>

## SUPPLEMENTARY MATERIALS/WEBSITES

### **Supplementary Manipulative Materials:**

- personal white board
- 100-bead demonstration rekenrek
- color tiles (inch and cm)
- interlocking cubes, 1cm
- wood rulers (inch & cm)
- meter stick
- 2-liter containers
- digital scale
- place value disk set
- tape measure
- whole number place value cards
- graduated cylinder (100ml, 1,000ml)
- platform scales
- syringe (10ml)
- plastic pitcher (1.5L)
- fraction tiles
- analog clock

### **Websites:**

- [Common Core State Standards for Mathematics](#)
- [National Council of Teachers of Mathematics](#)
- [Smarter Balanced Assessment Consortium](#)
- [Great Minds: Eureka Math<sup>2</sup>](#)
- [Khan Academy](#)
- [iReady Teacher Toolbox](#)
- [International Society for Technology in Education](#)
- [SFUSD Math Core Curriculum](#)

# Connecticut's Common Core Standards

## Mathematics – 3<sup>rd</sup> Grade

### **Operations and Algebraic Thinking - Represent and solve problems involving multiplication and division.**

- 3.OA.A.1: Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as  $5 \times 7$ .*
- 3.OA.A.2: Interpret whole-number quotients of whole numbers, e.g., interpret  $56 \div 8$  as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as  $56 \div 8$ .*
- 3.OA.A.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. (Note: See Glossary, Table 2.)
- 3.OA.A.4: Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations  $8 \times ? = 48$ ,  $5 = \square \div 3$ ,  $6 \times 6 = ?$ .*

### **Understand properties of multiplication and the relationship between multiplication and division.**

- 3.OA.B.5: Apply properties of operations as strategies to multiply and divide. (Note: Students need not use formal terms for these properties.) *Examples: If  $6 \times 4 = 24$  is known, then  $4 \times 6 = 24$  is also known. (Commutative property of multiplication.)  $3 \times 5 \times 2$  can be found by  $3 \times 5 = 15$ , then  $15 \times 2 = 30$ , or by  $5 \times 2 = 10$ , then  $3 \times 10 = 30$ . (Associative property of multiplication.) Knowing that  $8 \times 5 = 40$  and  $8 \times 2 = 16$ , one can find  $8 \times 7$  as  $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ . (Distributive property.)*
- 3.OA.B.6: Understand division as an unknown-factor problem. *For example, find  $32 \div 8$  by finding the number that makes 32 when multiplied by 8.*

### **Multiply and divide within 100.**

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

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

- 3.OA.D.8: Solve two-step word problems 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. (Note: 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.)
- 3.OA.D.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.*

**Number and Operations in Base Ten - Use place value understanding and properties of operations to perform multi-digit arithmetic.** (Note: A range of algorithms may be used.)

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

**Number and Operations – Fractions - Develop understanding of fractions as numbers.**

Note: Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.

- 3.NF.A.1: Understand a fraction  $1/b$  as the quantity formed by 1 part when a whole is partitioned into  $b$  equal parts; understand a fraction  $a/b$  as the quantity formed by  $a$  parts of size  $1/b$ .
- 3.NF.A.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram.
  - a. Represent a fraction  $1/b$  on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into  $b$  equal parts. Recognize that each part has size  $1/b$  and that the endpoint of the part based at 0 locates the number  $1/b$  on the number line.
  - b. Represent a fraction  $a/b$  on a number line diagram by marking off  $a$  lengths  $1/b$  from 0. Recognize that the resulting interval has size  $a/b$  and that its endpoint locates the number  $a/b$  on the number line.
- 3.NF.A.3: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
  - a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
  - b. Recognize and generate simple equivalent fractions, e.g.,  $1/2 = 2/4$ ,  $4/6 = 2/3$ . Explain why the fractions are equivalent, e.g., by using a visual fraction model.
  - c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form  $3 = 3/1$ ; recognize that  $6/1 = 6$ ; locate  $4/4$  and 1 at the same point of a number line diagram.
  - d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols  $>$ ,  $=$ , or  $<$ , and justify the conclusions, e.g., by using a visual fraction model.

**Measurement and Data - Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**

- 3.MD.A.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
- 3.MD.A.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Note: Excludes compound units such as  $\text{cm}^3$  and finding the geometric volume of a container.) 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. (Note: Excludes multiplicative comparison problems -- problems involving notions of “times as much”; see Glossary, Table 2.)

### **Represent and interpret data.**

- 3.MD.B.3: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*
- 3.MD.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.

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

- 3.MD.C.5: Recognize area as an attribute of plane figures and understand concepts of area measurement.
- 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.
  - A plane figure which can be covered without gaps or overlaps by  $n$  unit squares is said to have an area of  $n$  square units.
- 3.MD.C.6: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
- 3.MD.C.7: Relate area to the operations of multiplication and addition.
- 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.
  - 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.
  - Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths  $a$  and  $b + c$  is the sum of  $a \times b$  and  $a \times c$ . Use area models to represent the distributive property in mathematical reasoning.
  - 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.

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

- 3.MD.A.8: Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

### **Geometry - Reason with shapes and their attributes.**

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

## **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.**

## **Technology Competency Standards**

1. Creativity and Innovation - Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
2. Communication and Collaboration - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
3. Research and Information Fluency - Students apply digital tools to gather, evaluate, and use information.
4. Critical Thinking, Problem Solving, and Decision Making - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
5. Digital Citizenship - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
6. Technology Operations and Concepts – Students demonstrate a sound understanding of technology concepts, systems, and operations.