

TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

Mathematics
Grade 3
2014

(Last revision date: 2005)

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Grade 3 Mathematics

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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.

CORE VALUES AND BELIEFS

The Trumbull Public Schools Community, which engages in an environment conducive to learning, believes that all students will read and write effectively, therefore communicating in an articulate and coherent manner. All students will participate in activities that address problem-solving through critical thinking. Students will use technology as a tool in decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will encourage independent thinking and learning. We believe ethical conduct to be paramount in sustaining our welcoming school climate.

INTRODUCTION

The Elementary Math Curriculum was last revised in 2005 and was aligned to the CT Frameworks for Mathematics. In 2010, the State of Connecticut adopted the Common Core State Standards (CCSS) prompting all Connecticut schools to use these standards to guide instruction. This curriculum guide reflects the necessary changes to our curriculum for alignment with the CCSS. It also includes specific grade level expectations and resources appropriate for this grade, making it a truly 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.

Please note: Minor adjustments to this curriculum guide may be necessary to adhere to the CCSS. As additional state and national resources are shared, the district will add essential information to this document.

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.

The successful mathematician will:

- Acquire the factual knowledge necessary to solve problems
- Gain procedural proficiency in problem solving
- Demonstrate a perceptual understanding of problems posed
- Make meaningful mathematical connections to their world
- Solve problems utilizing a variety of strategies
- Utilize technology to improve the quality of the problem solving process
- Communicate effectively using mathematical terminology, both independently and collaboratively
- 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

The Trumbull Mathematics Program promotes the empowerment of students and encourages students 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 can access the beauty and power of mathematics and truly appreciate the impact it has on the world in which they live.

Developed by Trumbull K-12 Math Committee, June 2004; revised and approved April 2011

COURSE DESCRIPTION

In Grade 3, instructional time should focus on four critical areas:

1. Developing understanding of multiplication and division and strategies for multiplication and division within 100
2. Developing understanding of fractions, especially unit fractions (fractions with numerator 1)
3. Developing understanding of the structure of rectangular arrays and of area
4. Describing and analyzing two-dimensional shapes.

Grade 3 MATH GOALS

1. **Developing understanding of multiplication and division and strategies for multiplication and division within 100**

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

2. **Developing understanding of fractions, especially unit fractions (fractions with numerator 1)**

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

3. **Developing understanding of the structure of rectangular arrays and of area**

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

4. **Describing and analyzing two-dimensional shapes.**

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

Grade 3 Mathematics: Trimester 1 (60 Days)

Unit Name: Grade 3 Trimester 1																	
<p>Content and Skills</p> <p>Mathematical Practices: See Addendum</p> <p>Quantity, Measurement, and Data:</p> <ul style="list-style-type: none"> ▪ Solve problems involving measurements of intervals of time, liquid volumes, and masses of objects. ▪ Represent and interpret data. <p>Numeration, Operations, and Algebraic Thinking:</p> <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ▪ Represent and solve problems using multiplication and division. ▪ Understand properties of multiplication and the relationship between multiplication and division. ▪ Multiply and divide within 100. ▪ Solve problems involving the four operations, and identify and explain patterns in arithmetic. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ▪ Use place value understandings and properties of operations to perform multi-digit arithmetic. <p>Geometry: N/A</p>																	
<p>Essential Question(s): Taken from the CCSS Mathematical Practices</p> <ul style="list-style-type: none"> ▪ What is the problem asking? Does this make sense? (MP1) ▪ 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) ▪ Is my answer correct? How can I prove it mathematically? (MP6 and 7) <p>Focus Question(s): These will be content specific (i.e. Explain how you arrived at an answer)</p> <ul style="list-style-type: none"> ▪ Can you solve using a different strategy? ▪ Can you critique or agree with another person's strategy? 																	
Common Core State Standards for Mathematics <i>(See Appendix for complete description)</i>	Time Allotment	Assured Learner Activities	Assessment														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">3.OA.1</td> <td style="width: 50%; padding: 2px;">3.NBT.1</td> </tr> <tr> <td style="padding: 2px;">3.OA.3</td> <td style="padding: 2px;">3.NBT.2</td> </tr> <tr> <td style="padding: 2px;">3.OA.4</td> <td style="padding: 2px;">3.NBT.3</td> </tr> <tr> <td style="padding: 2px;">3.OA.5</td> <td style="padding: 2px;">3.MD.1</td> </tr> <tr> <td style="padding: 2px;">3.OA.7</td> <td style="padding: 2px;">3.MD.3</td> </tr> <tr> <td style="padding: 2px;">3.OA.8</td> <td style="padding: 2px;">3.MD.4</td> </tr> <tr> <td style="padding: 2px;">3.OA.9</td> <td style="padding: 2px;">3.MD.7</td> </tr> </table>	3.OA.1	3.NBT.1	3.OA.3	3.NBT.2	3.OA.4	3.NBT.3	3.OA.5	3.MD.1	3.OA.7	3.MD.3	3.OA.8	3.MD.4	3.OA.9	3.MD.7	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> -More or Less? -Practicing Place Value -Class Collections -Guess My Rule -Today's Number -What Time Is It? *Directions provided for all Classroom Routines and games found in text. 	<ul style="list-style-type: none"> ▪ Investigations in Number, Data, and Space © 2007 and 2010 Addendum ▪ Basic fact practice & review
3.OA.1	3.NBT.1																
3.OA.3	3.NBT.2																
3.OA.4	3.NBT.3																
3.OA.5	3.MD.1																
3.OA.7	3.MD.3																
3.OA.8	3.MD.4																
3.OA.9	3.MD.7																
<p>Technology Competency Standards <i>(See Appendix for complete description)</i></p> <p>2. Communicate and Collaborate</p> <p>4. Critical Thinking, Problem Solving, and Decision Making</p> <p>5. Digital Citizenship</p>			<ul style="list-style-type: none"> ▪ Baseline Assessment ▪ Trimester Benchmark Asmt ▪ Basic Fact Assessments (6) ▪ Classroom mathematical discourse ▪ Class at a Glance Spreadsheet 														

Grade 3 Mathematics: Trimester 2 (60 Days)

Unit Name: Grade 3 Mathematics: Trimester 2					
<p>Content and Skills</p> <p>Mathematical Practices: See Addendum</p> <p>Quantity, Measurement, and Data:</p> <ul style="list-style-type: none"> ▪ Solve problems involving measurements of intervals of time, liquid volumes, and masses of objects. ▪ Geometric Measurement: understand concepts of area and relate area to multiplication and to addition. <p>Numeration, Operations, and Algebraic Thinking:</p> <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ▪ Represent and solve problems using multiplication and division. ▪ Understand properties of multiplication and the relationship between multiplication and division. ▪ Multiply and divide within 100. ▪ Solve problems involving the four operations and identify and explain patterns in arithmetic. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ▪ Use place value understandings and properties of operations to perform multi-digit arithmetic. <p>Geometry:</p> <ul style="list-style-type: none"> ▪ Reason with shapes and their attributes. 					
<p>Essential Question(s): Taken from the CCSS Mathematical Practices</p> <ul style="list-style-type: none"> ▪ What is the problem asking? Does this make sense? (MP1) ▪ 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 patterns do I see in Quick Images? (MP6 and 7) <p>Focus Question(s): These will be content specific (i.e. Explain how you arrived at an answer)</p> <ul style="list-style-type: none"> ▪ Can you solve using a different strategy? ▪ Can you critique or agree with another person's strategy? 					
Common Core State Standards for Mathematics <i>(See Appendix for complete description)</i>		Time Allotment	Assured Learner Activities		Assessment
3.OA.2 3.OA.3 3.OA.4 3.OA.5 3.OA.6 3.OA.7 3.OA.8 3.OA.9 3.NBT.1	3.NBT.2 3.NBT.3 3.MD.1 3.MD.2 3.MD.5 3.MD.6 3.MD.7 3.MD.8 3.G.1	70 minutes daily per Trumbull Board of Education Policy # 6112.2	Ten Minute Math -Count Around Class -Practice Place Value -What's the Temp? -Guess My Rule -Today's Number -What Time Is It? -Class Collection -Quick Images *Directions provided for all Classroom Routines and games found in text.		<ul style="list-style-type: none"> ▪ Investigations in Number, Data, and Space © 2007 and 2010 Addendum ▪ Basic fact practice & review
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					<ul style="list-style-type: none"> ▪ Trimester Benchmark Assessment ▪ Basic Fact Assessments (6) ▪ Classroom mathematical discourse ▪ Class at a Glance Spreadsheet

Grade 3 Mathematics: Trimester 3 (61 Days)

Unit Name: Grade 3 Mathematics: Trimester 3					
<p>Content and Skills</p> <p>Mathematical Practices: See Addendum</p> <p>Quantity, Measurement, and Data:</p> <ul style="list-style-type: none"> ▪ Solve problems involving measurements of intervals of time, liquid volumes, and masses of objects. <p>Numeration, Operations, and Algebraic Thinking:</p> <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ▪ Represent and solve problems using multiplication and division. ▪ Understand properties of multiplication and the relationship between multiplication and division. ▪ Multiply and divide within 100. ▪ Solve problems involving the four operations, and identify and explain patterns in arithmetic. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ▪ Use place value understandings and properties of operations to perform multi-digit arithmetic. <p>Number and Operations – Fractions</p> <ul style="list-style-type: none"> ▪ Develop understanding of fractions as numbers. <p>Geometry:</p> <ul style="list-style-type: none"> ▪ Reason with shapes and their attributes. 					
<p>Essential Question(s): Taken from the CCSS Mathematical Practices</p> <ul style="list-style-type: none"> ▪ What is the problem asking? Does this make sense? (MP1) ▪ 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 patterns do I see in Quick Images? (MP6 and 7) <p>Focus Question(s): These will be content specific (i.e. Explain how you arrived at an answer)</p> <ul style="list-style-type: none"> ▪ Can you solve using a different strategy? ▪ Can you critique or agree with another person’s strategy? 					
Common Core State Standards for Mathematics <i>(See Appendix for complete description)</i>	Time Allotment	Assured Learner Activities	Assessment		
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> 3.OA.1 3.OA.2 3.OA.3 3.OA.4 3.OA.5 3.OA.6 3.OA.7 3.OA.8 </td> <td style="width: 50%; vertical-align: top;"> 3.OA.9 3.NBT.1 3.NBT.2 3.NF.1 3.NF.2 3.NF.3 3.MD.1 3.G.2 </td> </tr> </table>	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 3.NBT.1 3.NBT.2 3.NF.1 3.NF.2 3.NF.3 3.MD.1 3.G.2	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<p><u>Ten Minute Math</u></p> <ul style="list-style-type: none"> -Count Around Class -Practice Place Value -Today’s Number -What Time Is It? -Quick Images <p>*Directions provided for all Classroom Routines and games found in text.</p>	<ul style="list-style-type: none"> ▪ Trimester Benchmark Assessment ▪ Basic Fact Assessments (6) ▪ Classroom mathematical discourse ▪ Class at a Glance Spreadsheet
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<p>Technology Competency Standards <i>(See Appendix for complete description)</i></p>					
2. Communicate and Collaborate 4. Critical Thinking, Problem Solving, and Decision Making 5. Digital Citizenship					

Instructional/Teaching Strategies

Common Core State Standards 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 a structure.
8. Look for and express regularity in repeated reasoning.

Brainstorming; Classroom Discourse; Computational Fact Fluency Practice; Daily Classroom Routines; Model Instruction; Small Group Instruction; Whole Class Instruction; Peer Modeling; Problem Solving Strategies; Mathematical Vocabulary Walls; Math Journals; Word Problem Interpretation and Creation; Use Technology to Solve Problems; Question and Answer Sessions; Refocus Students; Flexible Grouping; Ten-Minute-Math; Use Graphic Organizers; Use Math Games; Identify Similarities and Differences, Note Taking, and Wait Time.

TEXTS

<i>Title</i>	<i>Author</i>	<i>Publisher</i>	<i>Date of Publication</i>
<i>Investigations In Number, Data, and Space</i>	<ul style="list-style-type: none">▪ TERC, Cambridge, MA▪ Pearson Publishing▪ National Science Foundation	<i>Pearson</i>	<i>2007</i>
<i>Investigations and the Common Core Standards</i>	<ul style="list-style-type: none">▪ TERC, Cambridge, MA▪ Pearson Publishing▪ National Science Foundation	<i>Pearson</i>	<i>2012</i>

SUPPLEMENTARY MATERIALS, RESOURCES, and TECHNOLOGY

Supplementary Materials:

- **Investigations Card Kits**
- **Manipulatives materials**
 - Base Ten Blocks
 - Coins sets and bills
 - Clocks
 - Dice 1 Inch color tiles
 - Fraction kits
 - Geometric solids
 - Meter/yard sticks
 - Number lines
 - Pattern Blocks
 - Rulers
 - Snap or Unifix cubes

Resources:

<i>Title</i>	<i>Author</i>	<i>Publisher</i>	<i>Date of Publication</i>
<i>Groundworks: Algebraic Thinking</i>	<i>Dr. Carole Greenes Dr. Carol Findell</i>	<i>The Wright Group</i>	<i>2006</i>
<i>Groundworks: Reasoning with Data and Probability</i>	<i>Dr. Carole Greenes Dr. Carol Findell Dr. Tammy Tsankova Dr. Barbara Irvin</i>	<i>The Wright Group</i>	<i>2006</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>2003</i>
<i>Math To Know Handbook</i>	<i>Mary C. Cavanagh</i>	<i>Houghton Mifflin Company</i>	<i>2000</i>
<i>Math To Know Teacher's Resource Book</i>	<i>Mary C. Cavanagh</i>	<i>Houghton Mifflin Company</i>	<i>2000</i>

Art Class:

- Create 2 and 3-Dimensional Shapes
- Measure using traditional measure rulers and meter sticks

Websites:

- **Common Core State Standards for Mathematics:**
<http://www.corestandards.org/Math>
- **Xtra Math:** <http://xtramath.org>
- **Learn Zillions:** <http://learnzillion.com>
- **National Library of Virtual Manipulatives:** <http://nlvm.usu.edu>
- **NCTM Illuminations:** www.illustrations.nctm.org
- **National Council of Teachers of Mathematics:** www.nctm.org
- **Pearson Successnet:** www.pearsonsuccessnet.com
- **Smarter Balanced Assessment Consortium:**
<http://www.smarterbalanced.org/>

Grade 3 Vocabulary:

A.M.	Data	Gram	Open shape
Add	Decagon	Greater than	Order
Addend	Decompose	Half hour	Order of Operations
Additive Identity Property of 0	Denominator	Halves	P.M.
Algorithm	Difference	Hexagon	Parallel lines
Analog Clock	Digit	Horizontal Bar graph	Parallelogram
Angle	Digital clock	Hour	Parentheses
Area	Distributive Property	Hundreds	Partition
Area Model	Divide	Inch	Pattern
Arithmetic Patterns	Dividend	Intersecting lines	Pentagon
Array	Divisible	Interval	Perimeter
Associative Property of Addition	Divisor	Inverse operations	Perpendicular
Associative Property of Multiplication	Eighths	Key	Perpendicular lines
Attribute	Elapsed time	Kilogram	Picture graph
Bar graph	Endpoint	length	Place value
Bar model	Equal	Less than	Plane shape
Base-ten numeral form	Equal groups	Line	Point
Base-ten numerals	Equal parts	Line plot	Polygon
Centimeter	Equation	Line segment	Product
Circle	Equivalent fractions	Liter	Quadrilateral
Closed shape	Estimate	Mass	Quarter hour
Column	Even number	Meter	Quotient
Commutative Property of Addition	Expanded form	Metric system	Ray
Commutative Property of Multiplication	Experiment	Midnight	Reasonableness
Compare	Expression	Minute	Rectangle
Compatible numbers	Fact family	Multiple	Rectilinear figure
Compose	Factor	Multiplicative Identity Property of 1	Regroup
Counting number	Foot	Multiply	Related facts
Customary system	Fourths	Noon	Repeated addition
	Fraction	Number line	Repeated subtraction
	Fraction bar	Numerator	Rhombus
	Fraction greater than one	Octagon	Right angle
	Fraction less than one	Odd number	Round a whole number
	Frequency table	Ones	Row
			Scale

Sides of equal length Sixths Skip count Square Square unit Standard form Subtract Sum Survey Tally table Tens Thirds Tiling Time interval Trapezoid Triangle Two dimensional Unit fraction Unit square Variable Venn Diagram Vertex Vertices Vertical bar graph Volume Whole Whole numbers Width Zero property of multiplication			
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Vocabulary adapted from the Granite Public Schools: www.graniteschools.org

RUBRICS

- *Report Card Rubric (Teacher's Only Appendix)*
- *Basic Fact Rubric (Teacher's Only Appendix)*

RESOURCE FILE and APPENDICES

- *Common Core State Standards for Mathematics*
- *Mathematical Practices Poster*
- *Technology Competency Standards*
- *Grade 3 District Basic Facts Plan*
- *Grade 3 Report Card*
- *Grade 3 Pacing Guides*
- *Grade 3 Parent Report Card Companion*

CURRENT REFERENCES

Common Core State Standards for Mathematics

www.corestandards.org

International Society for Technology in Education

www.iste.org/STANDARDS

National Council of Teachers of Mathematics

www.nctm.org

Connecticut's Common Core Standards

Mathematics – 3rd 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 5×7 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 5×7 .*
- 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 8×7 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., 9×80 , 5×60) 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 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.*

CCSS 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.