

TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

Mathematics
Grade 1

2022

Curriculum Writing Team:

Cassie Ekstrom	Grade 1 Teacher
Kristen Smeraglino	Grade 1 Teacher
Sue Velez	Grade 1 Teacher
Laura Coughlin	Math Specialist
Kim Lombardi	Program Leader Mathematics, K-5
Susan Iwanicki, Ed.D.	Assistant Superintendent

Grade 1 Mathematics

Table of Contents

Core Values and Beliefs	2
Introduction	2
Philosophy	3
Course Description Overview	4
Course Description	4
Grade 1 Math Year at a Glance	6
Trimester 1	9
Trimester 2	11
Trimester 3	14
Math Practices in First Grade	17
Instructional Strategies	19
Primary Resources	20
Supplemental Resources	20
Common Core State Standards in First Grade	21
Technology Competency Standards	23

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

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 2022 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 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.

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.

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 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.

COURSE DESCRIPTION

OVERVIEW: Major, Supporting, and Additional Focus Areas for First Grade Mathematics

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.

Numbers and Operations in Base Ten

- Extending the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data

- Measure lengths indirectly and by iterating length units.
- Tell and write time.
- Represent and interpret data.

Geometry

- Reason with shapes and their attributes.

In Grade 1, instructional time should focus on four critical areas:

1. ***Developing understanding of addition, subtraction, and strategies for addition and subtraction within 20***

Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., “making tens”) to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.

2. ***Developing understanding of whole number relationship and place value, including grouping in tens and ones***

Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.

3. *Developing understanding of linear measurement and measuring lengths as iterating length units*

Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement. (Note: students should apply the principle of transitivity of measurement to make direct comparisons, but they need not use this technical term.)

4. *Reasoning about attributes of, and composing and decomposing geometric shapes*

Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

GRADE 1 MATH- YEAR AT A GLANCE

Primary Resource: Bridges

September	<p><u>Building a Math Classroom & Unit 1: Numbers All Around Us</u></p> <p>To begin the year, students will establish routines for the math workshop. Students will learn to use Work Places to socially engage in mathematical learning and sharing of strategies. Small guided math groups are facilitated during this time to consolidate and extend their learning. In this unit, students will focus on the development of number sense and number combinations to 10. Students will be introduced to mathematical models (tally marks, number rack and 10-frames) to see number relationships that will develop into strategies which will be used for problem solving.</p>
October to Mid-November	<p><u>Unit 2: Developing Strategies With Dice and Dominoes</u></p> <p>In this unit, students will use dominoes, dot cards, and the number rack to build confidence using efficient and effective strategies to add and subtract single-digit numbers. These models will help students to subitize (to know a quantity without counting each individual part of a set). They will explore strategies such as counting on, building from know facts, using doubles facts, and counting by 5s and 10s to solve addition problems. By the end of this unit, students understand how to use these models to visualize various solutions to solve a problem.</p>
Mid-November to December	<p><u>Unit 3: Adding, Subtracting, Counting, & Comparing</u></p> <p>In this unit, students will practice key number facts and fact strategies for single-digit addition and subtraction. Students will use their number racks to see number combinations, find the sum of two numbers, and compare two numbers to find the difference. Students will develop an understanding of place-value and solve addition combinations to 20. Students will utilize Unifix cubes to develop understanding of the difference model of subtraction. This unit also emphasizes the concept of part-part-whole reasoning that is useful when combining or separating numbers. Strategies that will be introduced to students include: Even and Odd Numbers, Make Ten, Ten and Some More, and Comparison.</p>
January	<p><u>Unit 4: Leapfrogs on the Number Line</u></p> <p>In this unit, students will utilize both closed and open number lines as models of our number system. This unit revolves around the number line, which is an essential mathematical model. Students will locate numbers on a number line, use their reasoning skills and number sense to determine unknown values that correspond to empty boxes, and explore addition and subtraction. Students will become comfortable skip-jumping along open number lines in multiples of 5 and 10, forward and backward. To conclude this unit, students will measure penguins and compare those measurements.</p>

February to Mid-March	<p><u>Unit 5: Geometry</u></p> <p>In this unit, the students use a variety of tools to explore two-and three-dimensional shapes and fractions (halves, thirds, and fourths). They identify, describe, draw, compare, compose, and sort shapes. They work on expressing the world around them using geometry terms. Characteristics of shapes are realized through careful analysis. The students will construct and deconstruct a variety of shapes and develop an understanding of how shapes can be divided into equal parts.</p>
Mid-March to Late April	<p><u>Unit 6: Figure the Facts with Penguins</u></p> <p>In this unit, first graders will continue to develop fluency with addition and subtraction within 10 and use strategies within 20. They use tools to model and solve number combinations and story problems of all types. In the process, they learn how to write and solve equations that involve unknowns in all positions and determine whether addition and subtraction equations are true or false. Throughout the unit, the interesting context of penguins is used to engage young learners.</p>
Late April to Late May	<p><u>Unit 7: One Hundred & Beyond</u></p> <p>In this unit, students will focus on place value. Students will continue to develop a deep understanding of numbers to 120 as they estimate, count, compare, add, and subtract two-digit quantities using familiar models. Models that students will utilize include: sticks & bundles; dimes, nickels, and pennies; and the number line. This unit will require students to think about how symbols can have mathematical value, which is a significant step towards algebraic reasoning. Students will be encouraged to use various strategies to work through multi-digit computations (e.g. “splitting” strategy and “jumping” strategy).</p>
Late May to June	<p><u>Unit 8: Changes, Changes</u></p> <p>In this unit, students will consider the concept of change from several different angles. To begin the unit, students will make the link between time and change as they investigate some of the changes they can make to materials such as paper, craft sticks, and ice cubes in a second, a minute, and an hour. Students will then explore patterns and functions using a half-gallon milk carton and specially designed sets of change cards. Next, students will construct their own paper gliders in order to consider how changes to the design lead to differences in the flight path. To conclude the unit, students will explore ways they’ve grown and changed since they were born.</p>

GRADE 1 MATH YEAR AT A GLANCE

Primary Resource: Number Corner

	The focus is on counting and recognizing numbers from 0 to 30, with a special emphasis on understanding that teen numbers are made of 1 ten and some
--	--

September	more. Students use a wide variety of models that will help them work in groups of 2, 5, and 10. Students review the concept of unitizing; or, thinking of 10 items as a single unit called a ten.
October	The focus is on part-whole relationships among numbers to 10. Students use a number tree model to represent the set of fall objects on each day's marker as a total and two parts. They search for patterns in the sequence of markers, write equations to represent the objects shown, and create their own related stories.
November	The month begins with an introduction of the language of fractions and encourages students to use new vocabulary words including whole, halves, and fourths. Students discuss equal parts as they fold paper circles and squares into halves and fourths. Later in the month, activities will reinforce how smaller fractional parts make a whole.
December	The focus continues on many of the concepts introduced in November. Students complete their collection of 24 hours and learn how each day is divided into two equal parts, a.m. and p.m. They expand their exploration of doubles and halves to include numbers to 20 and become even more familiar with counting patterns as they work with the fifties and sixties and place value.
January	Students will work with equations and story problems with missing addends, minuends, or subtrahends, and students tell math stories to match the equations and use various strategies to solve for unknown parts. They work on coin collections and record their collections on a graph. They will also use known facts to solve related facts of 1 more or 1 less. Counting by 5s along the number line will be practiced as well.
February	Students will work with triangles and quadrilaterals to determine if the shapes are congruent. Students will determine congruence by replicating figures on a clear geoboard and superimposing one shape on top of the other. They will also identify and sort shapes by defining attributes.
March	March introduces students to telling time to the half-hour. Students learn to associate the term half-past with the halfway position of the hour hand and with the half-circle position of the minute hand on an analog clock. They explore the concept of elapsed time in $\frac{1}{2}$ hour and one hour increments.
April	April brings opportunities to review and extend mathematical concepts addressed this year. During Calendar Collector students collect popsicle sticks that they estimate, bundle into 10's and 1's, represent with tally marks, and use to measure and compare the length of classroom objects.
May/June	May/June activities focus on numbers up to 120, with students using the number grid for addition and subtraction. Students will also extend their concepts about fractions to quarters and dollars by thinking of a quarter as one-fourth of a dollar. Counting the days in school continues with an eye toward 200 and summer vacation.

GRADE 1 MATHEMATICS: TRIMESTER 1

TRIMESTER 1

CONTENT AND SKILLS

Numeration, Operations, and Algebraic Thinking:

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction
- Understand and apply properties of operations and the relationship between addition and subtraction
- Add and subtract within 20
- Work with addition and subtraction equations

Number and Operations in Base Ten

- Extend the counting sequence
- Understand place value.
- Use place value understanding and properties of operations to add and subtract

Measurement and Data:

- Measure lengths indirectly and by iterating length units
- Tell and write time
- Represent and interpret data

Geometry:

- Reason with shapes and their attributes

BIG IDEAS: Student Learning Outcomes

First Grade Mathematicians can:

- solve addition and subtraction story problems to 10.
- count on to add and count back to subtract.
- fluently add and subtract to 10.
- find the unknown number in an addition equation.
- count by ones & tens to 60; I can read and write numbers to 60.
- use the $>$, $=$, and $<$ to compare two numbers.
- read a graph and answer questions about the data.

Focus Questions:

- What patterns do I see in the numbers?
- Can I model my thinking using manipulatives, words, numbers or pictures?
- How can this number be broken into smaller parts? How can these numbers be put together?
- How do I identify the appropriate information I need to solve this problem?
- Can I use a different strategy?
- Is my answer correct? How can I prove it mathematically?

Focused Common Core State Standards for Mathematics

(See p. 16-17 for complete description)

Time Allotment

Assured Learner Activities

Assured Assessment

1.OA.1 1.OA.5 1.OA.6 1.OA.8	1.NBT.1 1.NBT.3 1.NBT.4 1.MD.4	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<p>Bridges In Mathematics</p> <p><u>Unit 1:</u> Numbers All Around Us</p> <ul style="list-style-type: none"> ▪ Counting & Data ▪ Addition & Subtraction to 10 <p><u>Unit 2:</u> Developing Strategies with Dice and Dominoes</p> <ul style="list-style-type: none"> ▪ Counting & Comparing Numbers ▪ Fact Families & Strategies ▪ Counting by 5's and 10's <p><u>Unit 3:</u> Adding, Subtracting, Counting, & Comparing</p> <ul style="list-style-type: none"> ▪ Single-Digit Sums ▪ Tens & Teens ▪ Exploring Equations <p>Number Corner</p> <ul style="list-style-type: none"> ▪ September ▪ October ▪ November 	<ul style="list-style-type: none"> ▪ Bridges Assessments within Units ▪ Number Corner Baseline and Assessment
<p>Math Practices (MP 1-8) <i>(See appendix for complete description)</i></p>				
<p>Technology Competency Standards <i>(See appendix for complete description)</i></p> <p>2. Communicate and Collaborate</p> <p>5. Digital Citizenship</p>				

Vocabulary: Bridges

Unit 1:

add, attribute, between, circle, compare, cone, cube, cylinder, dime, edge, equation, estimate, expression, face, greater, than, hexagon, less, less than, more, ones, penny, pyramid, rectangle, rectangular prism, rhombus, sphere, square, tens, three-dimensional, (3-D) shape, trapezoid, triangle, triangular prism, two-dimensional, (2-D) shape, vertex or corner, addition combinations, flat, in all, longer than, number words 1–5, problem, short, shorter than, solid, sort, surface, tall

Unit 2:

add, cent (¢), column, compare, difference, dime, equal, equation, even number, fact family, fourth, greater than, half, less than, nickel, odd, number pattern, penny, row, square, subtract, sum or total, triangle, addition, double, doubles, minus, plus, problem, problem solving, reasonable, strategies, subtraction

Unit 3:

add, compare, difference, equal, equation, greater than, half, less than, ones, subtract, sum or total, tens, addition combinations, double, even, graph, minus, odd, plus, problem -solving strategies, subtraction

Number Corner:

September

add, after, before, column, count, data, digit, equal, equation, estimate, greater than, least, less than, more, most, nickel, number, number line, ones, pattern, penny, row, sum or total, tens, backward, chart, coin, collection, counting, date, day, decade, decade families, different, double ten frame, estimation, fewer, forward, graph, greater, how many, in all, month, more than, observe, ones, family order, pictures, same, solve, sticks & bundles, story problem, tally marks, teens family, ten-frame, week, year

October

add, after, before, column, data, equal, equation, estimate, greater than, hexagon, least, less than, more, most, number, number line, pattern, picture graph, rhombus, row, subtract, sum or total, trapezoid, triangle, backward, chart, collection, count by date, day, decade, decade families, different, equals, estimation, fewer, forward, graph, how many in all, month, more than, number tree, parts, pictures, same, solve, story problem ten-frame, year

November

add, after, before, between, circle, clock, face, column, equal, equation, fourth, fraction, greater, than, half, hour (hr.), least, less than, minute (min.), most, number line, row, square, subtract, sum, total, whole, analog clock, backward, chart, clockwise, collect, count by date, day, decade, decade families, diagonal, digital clock, double, equals, forward, halves, hour hand, midday, midnight, minute hand, month, noon, parts, sideways, ten-frame, time, timeline, year

GRADE 1 MATHEMATICS: TRIMESTER 2

Trimester 2

CONTENT AND SKILLS

Numeration, Operations, and Algebraic Thinking:

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction
- Understand and apply properties of operations and the relationship between addition and subtraction
- Add and subtract within 20
- Work with addition and subtraction equations

Number and Operations in Base Ten

- Extend the counting sequence
- Understand place value.
- Use place value understanding and properties of operations to add and subtract

Measurement and Data:

- Measure lengths indirectly and by iterating length units
- Tell and write time
- Represent and interpret data

Geometry:

- Reason with shapes and their attributes

BIG IDEAS: Student Learning Outcomes

First Grade Mathematicians can:

- solve addition and subtraction story problems to 14.
- solve subtraction combinations using related addition facts (e.g. fact families).
- count on to add and count back to subtract.
- fluently add and subtract facts to 10.
- find the unknown number in addition and subtraction equations.
- count by ones & tens to 120; I can read and write numbers to 120.
- tell how many tens & ones there are in a 2-digit number.
- compare pairs of 2-digit numbers using the symbols $>$, $=$, and $<$
- add 2-digit numbers that are multiples of 10.
- find 10 more or 10 less of a 2-digit number.
- identify and describe 2-D and 3-D shapes.
- divide circles and rectangles into two and four equal parts and describe them.

Focus Questions:

- What is the problem asking? Does this make sense?
- Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree?
- Can I model my thinking using manipulatives, words, numbers or pictures?
- Can I solve using a different strategy?
- How can putting numbers on a line help me to understand addition and subtraction?
- How can I represent relationships between the numbers 0-120?
- How does geometry help me understand the world around me?
- What are the attributes of this shape? How are they alike and different to another shape?
- How can shapes be divided into equal parts?

Common Core State Standards for Mathematics <i>(See appendix for complete description)</i>		Time Allotment	Assured Learner Activities	Assured Assessments
1.OA.1 1.OA.4 1.OA.5 1.OA.6 1.OA.8 1.NBT.1 1.NBT.2	1.NBT.3 1.NBT.4 1.NBT.5 1.NBT.6 1.G.1 1.G.2 1.G.3	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<p>Bridges In Mathematics</p> <p><u>Unit 3:</u> Adding, Subtracting, Counting, & Comparing</p> <ul style="list-style-type: none"> ▪ Single-Digit Sums ▪ Tens & Teens ▪ Exploring Equations <p><u>Unit 4:</u> Leapfrogs on the Number Line</p> <ul style="list-style-type: none"> ▪ Adding & Subtracting on the Life-Sized Number Line ▪ Jumping by 5's & 10's ▪ Measuring, Comparing, and Subtracting with Penguins <p><u>Unit 5:</u> Geometry</p> <ul style="list-style-type: none"> ▪ Introducing 2-D Shapes ▪ Introducing 3-D Shapes ▪ Putting Shapes Together & Taking Them Apart <p>Number Corner</p> <ul style="list-style-type: none"> ▪ December ▪ January ▪ February ▪ March 	<ul style="list-style-type: none"> ▪ Bridges Assessments within Units ▪ Number Corner Baseline and Assessment
Math Practices (MP 1-8) <i>(See appendix for complete description)</i>				
Technology Competency Standards <i>(See appendix for complete description)</i>				
2. Communicate and Collaborate 5. Digital Citizenship				

<p>Vocabulary: <u>Bridges</u></p> <p>Unit 3: add, compare, difference, equal, equation, greater than, half, less than, ones, subtract, sum or total, tens, addition combinations, double, even, graph, minus, odd, plus, problem -solving strategies, subtraction</p> <p>Unit 4: add, compare, data, difference, equal, equation, half, height, inch (in.), less than, long/longer/longest, number line, open number line, short/shorter/ shortest, subtract, sum or total, tens, add, compare, data, difference, equal, equation, half, height, inch (in.), less than, long/longer/longest, number line, open number line, short/shorter/ shortest, subtract, sum or total, tens</p> <p>Unit 5: add, attribute, circle, compare, cone, cube, cylinder, edge, equal, equation, face, fourth, fraction, half, hexagon, pyramid, rectangle, rectangular prism, rhombus, side, sphere, square, third, three-dimensional (3-D), shape, trapezoid, triangle, triangular prism, two-dimensional (2-D), shape, vertex or corner, actual/actually, addition, flat, graph, identify, information, net, parallel lines, plus, predict, prediction, problem solving, quarter (one fourth), rotate/turn, slide, solid, strategies, tally, the same</p>
--

Number Corner:

December

add, after, before, clock, face, column, cube, cylinder, edge, equal, equation, face, greater than, half hour (hr.), least, less than, minute (min.), most, number line, rectangular prism, row, sphere, subtract, sum or total, vertex or corner, afternoon, analog clock, backward, chart, choral count, clockwise, collect, count by date, day, decade, decade families, digital clock, double, evening, forward, halves, hour hand, in all, midday, midnight, minute hand, month, morning, night, noon, number family, shape, ten-frame, time, timeline, year

January

add, after, bar graph, before, column, compare, data, difference, dime, equal, equation, estimate, greater than, least, less than, most, number, number line, penny, row, subtract, sum, or total, add, after, bar graph, before, column, data, difference, dime, equal, equation, estimate, greater than, least, less than, most, number, number line, penny, row, subtract, sum, or total, year, backward, chart, choral count, coin collection, count by, date, day, decade, decade families, different, double, fewer, forward, graph, how many in all, month, number tree, one less, one more, part, pictures, same, solve, story problem, ten-frame, variable, year

February

add, after, before, column, congruent, data, equal, equation, estimate, greater, than, least, less, than, most, number, line, parallelogram, rectangle, rhombus, row, side, subtract, sum, or total sum, trapezoid, triangle, vertex, corner, addend, backward, chart, choral, count, collection, count by, date, day, decade, decade families, dice, different, double, estimation, fewer, forward, geoboard, greater, identical, in all, month, more than, multiple, (more than one) range, right angle, same, shape, size, ten-frame, tile, year

March

add, after, analog clock, bar graph, before, circle, column, compare, data, difference, digital clock, dime, equal, equation, estimate, greater than, half-hour, hour (hr.), least, less than, minute (min.), more, most, nickel, number, number line, ones, penny, rectangle, row, square, subtract, sum, or total tens, trapezoid, triangle, addend, backward, century, chart, choral count, clock face, clockwise, coin collection, corners, count by, date, day, decade, decade families, different, double, estimation, fewer, forward, graph, greater, half past, hour hand, midday, midnight, minuend, minute, hand, month, more than, noon, o'clock, pictures, quarter, circle, range, same, sides, solve, story problem, ten-frame, tile, time, year

GRADE 1 MATHEMATICS: TRIMESTER 3

Trimester 3

CONTENT AND SKILLS

Numeration, Operations, and Algebraic Thinking:

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction
- Understand and apply properties of operations and the relationship between addition and subtraction
- Add and subtract within 20
- Work with addition and subtraction equations

Number and Operations in Base Ten

- Extend the counting sequence
- Understand place value
- Use place value understanding and properties of operations to add and subtract

Measurement and Data:

- Tell and write time
- Represent and interpret data

Geometry:

- Reason with shapes and their attributes

BIG IDEAS: Student Learner Outcomes

First Grade Mathematicians can:

- fluently add and subtract facts to 10; use strategies to add and subtract to 20.
- solve addition and subtraction story problems to 20.
- solve story problems that involve adding three numbers.
- solve subtraction combinations using related fact families.
- identify addition and subtraction equations as true or false.
- find the unknown number in addition and subtraction equations.
- count, read, write and represent numbers to 120.
- use and explain two or more strategies to add and subtract 2-digit numbers.
- explain how to find 10 more or 10 less than a 2-digit number.
- put three objects in order by length and compare two objects by using a third.
- measure length by using nonstandard units (e.g. popsicle sticks and cubes)
- tell and write time to the hour and half-hour using analog & digital clocks.
- construct and read a graph to answer questions about the data.

Focus Questions:

- What is the problem asking? Does this make sense?
- Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree?
- Can I model my thinking using manipulatives, words, numbers or pictures?
- How do addition and subtraction relate to one another?
- How do I figure out what information I need in order to write an equation and solve a problem?
- Does my answer make sense and how can I explain my answer to someone else?
- How can counting patterns help me to understand large numbers?
- How can I compare, add, and subtract 2 digit numbers based on an understanding of tens and ones?

Common Core State Standards for Mathematics <i>(See appendix for complete description)</i>	Time Allotment	Assured Learner Activities	Assured Assessments
1.OA.1 1.OA.2 1.OA.3 1.OA.4 1.OA.6 1.OA.7 1.OA.8 1.NBT.1 1.NBT.3 1.NBT.4 1.NBT.5 1.NBT.6 1.MD.1 1.MD.2 1.MD.3 1.MD.4	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<ul style="list-style-type: none"> ▪ Bridges In Mathematics: Bridges Kindergarten ▪ Bridges Number Corner <p><u>Unit 6:</u> Figure the Facts with Penguins</p> <ul style="list-style-type: none"> ▪ Combinations & Story Problems ▪ Solving for the Unknown ▪ Measuring & Comparing 	<ul style="list-style-type: none"> ▪ Bridges Assessments within Units ▪ Number Corner Baseline and Assessment
Math Practices (MP 1-8) <i>(See appendix for complete description)</i>		<p><u>Unit 6:</u> Figure the Facts with Penguins</p> <ul style="list-style-type: none"> ▪ Combinations & Story Problems ▪ Solving for the Unknown ▪ Measuring & Comparing 	
Technology Competency Standards <i>(See appendix for complete description)</i> 2. Communicate and Collaborate 5. Digital Citizenship		<p><u>Unit 7:</u> One Hundred & Beyond</p> <ul style="list-style-type: none"> ▪ Counting groups of 10s & 1s ▪ Adding & Subtracting 2-Digit Numbers ▪ Place Value with Money <p><u>Unit 8:</u> Changes, Changes</p> <ul style="list-style-type: none"> ▪ Time & Duration ▪ Patterns, Structure, & Change ▪ Measuring our Growth <p>Number Corner</p> <ul style="list-style-type: none"> ▪ March ▪ April ▪ May/June 	

Vocabulary: Bridges

Unit 6

add, compare, count on, difference, equal, equation, even, number, fact family, foot (ft.), greater than, height, inch (in.), less than, pattern, subtract, sum or total, triangle, whole, add, Nine fact, add Ten fact, addition chart, closest to, combination, combine, double, double ten frame, Doubles fact, Doubles Plus or Minus One Fact, false, join, longer than, Make Ten fact, measure, minus, missing addend, more than, observation, pair, part, partner, plus, separate, shorter than, story problem, strategy, subtraction, take away, taller than, ten-frame, true, unknown number

Unit 7

add, after, before, compare, count back, count on, count difference, digit, dime, equation, estimate, fourth, greater than, hundreds, length, less than, nickel, ones, penny, square, subtract, sum or total, tens, addition, backward, beginning, coin/coins, combination, coordinate grid, coordinates, distance, end, equal parts, first, fives, forward, hundred paces, quarter (one fourth), reasonable, section, steps, strategies, subtraction, two-digit number, twos, zero

Unit 8

add, compare, count, cube, difference, edge, equal, greater than, half, hour (hr.), hundreds, length, less than, long/longer/longest, minute (min.), number line, ones, pattern, rectangle, second (sec.), short/shorter/shortest, subtract, sum, total, tens, weight, addition, change, chart, circumference, clock, clock face, day, distance, double, fast fives, fold, graph, group/groups, highest, left side, location, lowest, measure, minus, minute hand, more than, order, parallel, plus, range, right side, rule, second hand, slow, strategies, subtraction, sudden, T-chart, tally marks, the same, time, year

Number Corner

March

add, after, analog clock, bar graph, before, circle, column, compare, data, difference, digital clock, dime, equal, equation, estimate, greater than, half-hour, hour (hr.), least, less than, minute (min.), more, most, nickel, number, number line, ones, penny, rectangle, row, square, subtract, sum, or total tens, trapezoid, triangle, addend, backward, century, chart, choral count, clock face, clockwise, coin collection, corners, count by, date, day, decade, decade families, different, double, estimation, fewer, forward, graph, greater, half past, hour hand, midday, midnight, minuend, minute, hand, month, more than, noon, o'clock, pictures, quarter, circle, range, same, sides, solve, story problem, ten-frame, tile, time, year

April

add, after, before, between, circle, column, congruent, data, digit, equal, equation, estimate, fourth, greater than, half, hexagon, hundreds, length, less than, long/longer/ longest, number line, ones, polygon, rectangle, rhombus, row, short/shorter/shortest, side, square, sum, or total, symmetry, tens, trapezoid, triangle, vertex, corner, whole, asymmetrical, backward, bundle, century, chart, choral count, collection, count by, day, decade, decade families, estimation, forward, identical, measure, measurement, number grid, parts, quantity, range, symmetrical, tally marks, year

May/June

above, add, after, below, cent (¢), circle, column, data, digit, equal, equation, estimate, expression, fourth, half, hundreds, less than, line, missing, number, number line, ones, quarter, row, square, subtract, sum, or total tens, arrow, backward, century, chart, choral, count, coin collection, count by, day, decade, decade families, dollar, dollar sign, estimation, false, forward, measure, more than, neighbor, number grid, off-decade, part, problem, solve, true, year

What Do the **Math Practices** Look Like in First Grade?

Math Practice	Explanations and Examples
Habits of Mind	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>As the teacher uses thoughtful questioning and provides opportunities for students to share thinking, Grade 1 students become conscious of what they know and how they solve problems. They make sense of task-type problems, find an entry point or a way to begin the task, and are willing to try other approaches when solving the task. They ask themselves, “Does this make sense?” Grade 1 students’ conceptual understanding builds from their experiences in Kindergarten as they continue to rely on concrete manipulatives and pictorial representations to solve a problem, eventually becoming fluent and flexible with mental math as a result of these experiences.</p>
	<p>MP.6 Attend to precision</p> <p>Mathematically proficient students in Grade 1 attend to precision in their communication, calculations, and measurements. They are able to describe their actions and strategies clearly, using grade-level appropriate vocabulary accurately. Their explanations and reasoning regarding their process of finding a solution becomes more precise. In varying types of mathematical tasks, first grade students pay attention to details as they work. For example, as students’ ability to attend to position and direction develops, they begin to notice reversals of numerals and self-correct when appropriate. When measuring an object, students check to make sure that there are not any gaps or overlaps as they carefully place each unit end to end to measure the object (iterating length units). Mathematically proficient first grade students understand the symbols they use ($=$, $>$, $<$) and use clear explanations in discussions with others. For example, for the equation $4 + 1 = 3 + 2$, a proficient student who is able to attend to precision states, “Four plus one is the same as three plus two because they both add up to five.”</p>
Reasoning and Explaining	<p>MP.2 Reason abstractly and quantitatively</p> <p>Mathematically proficient students in Grade 1 recognize that a number represents a specific quantity. They use numbers and symbols to represent a problem, explain thinking, and justify a response. For example, when solving the problem: “There are 60 children on the playground. Some children line up. There are 20 children still on the playground. How many children lined up?” First grade students may write $20 + 40 = 60$ to indicate a Think-Addition strategy. Other students may illustrate a counting-on by tens strategy by writing $20 + 10 + 10 + 10 + 10 = 60$. The numbers and equations written illustrate the students’ thinking and the strategies used, rather than how to simply compute, and show how the story is decontextualized as it is represented abstractly with symbols.</p>
	<p>MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>Mathematically proficient students in Grade 1 continue to develop their ability to clearly express, explain, organize and consolidate their math thinking using both verbal and written representations. Their understanding of grade-appropriate vocabulary helps them to construct viable arguments about mathematics. For example, when justifying why a particular shape isn’t a square, a first grade student may hold up a picture of a rectangle, pointing to the various parts, and reason, “It can’t be a square because, even though it has 4 sides and 4 corners, the sides aren’t all the same size.” In a classroom where risk-taking and varying perspectives are encouraged, mathematically proficient students are willing and eager to share their ideas with others, consider other ideas proposed by classmates, and question ideas that don’t seem to make sense.</p>

Modeling & Using Tools	MP.4 Model with mathematics.	Mathematically proficient students in Grade 1 model real-life mathematical situations with manipulatives, sketches, and/or equations, and check to make sure that their models accurately match the problem context. They also use tools, such as tables, to help collect information, analyze results, make conclusions, and review their conclusions to see if the results make sense and revising as needed.
	MP.5 Use appropriate tools strategically.	Mathematically proficient students in Grade 1 have access to a variety of concrete (e.g. three-dimensional solids, ten frames, number racks, number lines) and technological tools (e.g., virtual manipulatives, apps, interactive websites) and use them to investigate mathematical concepts. They select tools that help them solve and/ or illustrate solutions to a problem. They recognize that multiple tools can be used for the same problem, and choose those that make best sense, given their current level of development. For example, a child who still counts all may choose linking cubes to solve a combination such as $5 + 6$. A student who has started to recognize the relationship between addition facts may model and solve the combination on a physical or virtual number rack, noting that $5 + 6$ is 11 because it is 1 more than $5 + 5$. As the teacher provides numerous opportunities for students to use educational materials, first grade students’ conceptual understanding and higher-order thinking skills are developed.
Structures & Generalizing	MP.7 Look for and make use of structure.	Mathematically proficient students in Grade 1 carefully look for patterns and structures in the number system and other areas of mathematics. For example, while solving addition problems using a number rack, students recognize that regardless of whether you show 7 on the top row and 4 on the bottom or vice versa, they both equal 11 (commutative property). When decomposing two-digit numbers, students realize that the number of tens they have constructed coincides with the digit in the tens place. When exploring geometric properties, first graders recognize that certain attributes are critical (number of sides and vertices), while other properties, such as size, color and orientation, are not.
	MP.8 Look for and express regularity.	Mathematically proficient students in Grade 1 begin to look for regularity in problem structures when solving mathematical tasks. For example, when adding three one-digit numbers students look for doubles or combinations of 10. Thus, when solving $8 + 7 + 2$, a student may say, “I know that 8 and 2 equal 10 and then I add 7 more. That makes 17. It helps to see if I can make a 10 out of 2 numbers when I start.” Further, students use repeated reasoning while solving a task with multiple correct answers. For example, in the task “There are 12 hot air balloons in the sky. Some are above the clouds and some are below. How many of each could there be?” first graders may use a number rack to show 6 and 6. They may then add one more bead to the top row and remove one from the bottom row to make another combination that totals twelve— $7 + 5$. They may repeat this process several times until they have a sequence of combinations, and then note the patterns that exist in the sequence.

Source: Bridges in Mathematics Second Edition Grade 1 Assessment Guide, The Math Learning Center: Salem, Oregon 2017

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.

Facilitation Styles	<ul style="list-style-type: none">▪ Direct instruction▪ Guided instruction▪ Group work▪ Partner work▪ Independent practice▪ Formative and summative assessments
Routines	<ul style="list-style-type: none">▪ Turn & talk▪ Work Places▪ Math tool use▪ Calendar Grid▪ Calendar Collector▪ Computational Fluency▪ Number Line▪ Days in School

PRIMARY RESOURCES

<i>Title</i>	<i>Author</i>	<i>Date of Publication</i>
Bridges in Mathematics 2 nd Edition © 2017	<i>The Math Learning Center</i> <i>Salem, Oregon</i>	2017
Number Corner 2 nd Edition © 2017	<i>The Math Learning Center</i> <i>Salem, Oregon</i>	2017

SUPPLEMENTAL MATERIALS

- *Bridges in Mathematics and Number Corner kits*
<https://www.mathlearningcenter.org/curriculum/bridges/components/package>
- *Bridges Family Support*
<https://www.mathlearningcenter.org/families/bridges2>
- *(Spanish) Bridges Family Support*
<https://www.mathlearningcenter.org/sites/default/files/documents/family/family-orientation-sp.pdf>
- *Connecticut Core State Standards for Mathematics*
<http://www.corestandards.org/Math>
- *Technology Competency Standards*
www.iste.org/STANDARDS
- *National Council of Teachers of Mathematics*
www.nctm.org

Connecticut's Common Core Standards

Mathematics - 1st Grade Standards

Operations and Algebraic Thinking - Represent and solve problems involving addition and subtraction.

- 1.OA.A.1: Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (Note: See Glossary, Table 1.)
- 1.OA.A.2: Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

- 1.OA.B.3: Apply properties of operations as strategies to add and subtract. (Note: Students need not use formal terms for these properties.)
Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)
- 1.OA.B.4: Understand subtraction as an unknown-addend problem. *For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.*

Add and subtract within 20.

- 1.OA.C.5: Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
- 1.OA.C.6: Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

Work with addition and subtraction equations.

- 1.OA.D.7: Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.*
- 1.OA.D.8: Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers.
For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = \quad - 3$, $6 + 6 = \quad$.

Number and Operations in Base Ten - Extend the counting sequence.

- 1.NBT.A.1: Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Understand place value.

- 1.NBT.B.2: Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:
- 10 can be thought of as a bundle of ten ones — called a “ten.”
 - The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
 - The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
- 1.NBT.B.3: Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

Use place value understanding and properties of operations to add and subtract.

- 1.NBT.C.4: Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
- 1.NBT.C.5: Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
- 1.NBT.C.6: Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Measurement and Data - Measure lengths indirectly and by iterating length units.

- 1.MD.A.1: Order three objects by length; compare the lengths of two objects indirectly by using a third object.
- 1.MD.A.2: Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

Tell and write time.

- 1.MD.B.3: Tell and write time in hours and half-hours using analog and digital clocks.

Represent and interpret data.

- 1.MD.C.4: Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Geometry - Reason with shapes and their attributes.

- 1.G.A.1: Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
- 1.G.A.2: Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. (Note: Students do not need to learn formal names such as “right rectangular prism.”)
- 1.G.A.3: Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

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.