TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

Mathematics
Grade 1

2014

Updated Math Pilot, September 2021
New resources identified in BLUE

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Grade 1 Mathematics

Table of Contents

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 1, instructional time should focus on four critical areas:

1. *Developing understanding of addition, subtraction, and strategies for addition and subtraction within 20*
2. *Developing understanding of whole number relationship and place value, including grouping in tens and ones*
3. *Developing understanding of linear measurement and measuring lengths as iterating length units*
4. *Reasoning about attributes of, and composing and decomposing geometric shapes*

GOALS: Major Focus Areas for Grade 1 Mathematics

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 <u>counting on</u> 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. The 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 Mathematics: Trimester 1 (60 days)

Unit Name: Grade 1 Trimester 1

Content and Skills

Mathematical Practices: See Addendum for Mathematical Practices Poster

Quantity, Measurement, and Data:
- Represent and interpret time.

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.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.

Geometry:
- Reason with shapes and their attributes.

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

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?

Common Core State Standards for Mathematics *(See appendix for complete description)*		Time Allotment	Assured Learner Activities	Assessment
1.OA.1 1.OA.2 1.OA.3 1.OA.4 1.OA.5 1.OA.6 1.OA.7	1.OA.8 1.NBT.1 1.NBT.3 1.MD.4 1.G.1 1.G.2	70 minutes daily per Trumbull Board of Education Policy # 6112.2	▪ **Bridges In Mathematics: Bridges Kindergarten** ▪ **Bridges Number Corner**	▪ **Bridges Assessments within Units** ▪ **Number Corner Baseline and Assessment**
Technology Competency Standards *(See appendix for complete description)*				
2. Communicate and Collaborate 5. Digital Citizenship				

Grade 1 Mathematics: Trimester 2 (60 Days)

Unit Name: Grade 1 Mathematics: Trimester 2

Content and Skills

Mathematical Practices: See Addendum for Mathematical Practices Poster

Quantity, Measurement, and Data:
- Measure lengths indirectly and by iterating length units.
- Tell and write time.
- Represent and interpret data.

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.

Geometry:
- Reason with shapes and their attributes.

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

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?

Common Core State Standards for Mathematics *(See appendix for complete description)*		Time Allotment	Assured Learner Activities	Assessment
1.OA.1 1.OA.2 1.OA.3 1.OA.4 1.OA.5 1.OA.6 1.OA.7 1.OA.8 1.NBT.1	1.NBT.2 1.NBT.3 1.MD.1 1.MD.2 1.MD.3 1.MD.4 1.G.1 1.G.2 1.G.3	70 minutes daily per Trumbull Board of Education Policy # 6112.2	▪ **Bridges In Mathematics: Bridges Kindergarten** ▪ **Bridges Number Corner**	▪ **Bridges Assessments within Units** ▪ **Number Corner Baseline and Assessment**
Technology Competency Standards *(See appendix for complete description)*				
2. Communicate and Collaborate 5. Digital Citizenship				

Grade 1 Mathematics: Trimester 3 (61 Days)

Unit Name: Grade 1 Mathematics: Trimester 3

Content and Skills

Mathematical Practices: See Addendum for Mathematical Practices Poster

Quantity, Measurement, and Data:
- Tell and write time.
- Represent and interpret data.

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.

Geometry:
- Reason with shapes and their attributes.

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

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?

Common Core State Standards for Mathematics *(See appendix for complete description)*		Time Allotment	Assured Learner Activities	Assessment
1.OA.1 1.OA.2 1.OA.3 1.OA.5 1.OA.6 1.OA.7 1.OA.8 1.NBT.1	1.NBT.2 1.NBT.3 1.NBT.4 1.NBT.5 1.NBT.6 1.MD.3 1.MD.4 1.G.1 1.G.2	70 minutes daily per Trumbull Board of Education Policy # 6112.2	▪ **Bridges In Mathematics: Bridges Kindergarten** ▪ **Bridges Number Corner**	▪ **Bridges Assessments within Units** ▪ **Number Corner Baseline and Assessment**
Technology Competency Standards *(See appendix for complete description)*				
2. Communicate and Collaborate 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.

Text and Materials Kit

Title	Author/Publisher	Date of Publication
Bridges in Mathematics 2nd Edition ©2016	**The Math Learning Center Salem Oregon**	**2016**

SUPPLEMENTARY MATERIALS/ RESOURCES/ TECHNOLOGY

Supplementary Materials

Manipulatives provided for each Grade 1 classroom

- Manipulative materials

  o Calendar
  o Clock
  o Coin sets
  o 1 Inch color tiles
  o 2-color counters
  o Dice
  o Geoblocks
  o Geometric solids
  o Hundreds board
  o Hundreds number charts
  o Pattern blocks
  o Number cubes
  o Number line
  o Power polygons
  o Rulers
  o Sorting materials
  o Snap or Unifix cubes
  o Teddy bear counters

Additional Resources

Groundworks: Reasoning with Data and Probability	*Dr. Carole Greenes* *Dr. Carol Findell* *Dr. Tammy Tsankova* *Dr. Barbara Irvin*	*The Wright Group*	*2006*
Groundworks: Reasoning About Measurement	*Dr. Carole Greenes* *Dr. Carol Findell* *Dr. Linda Schulman Dacey* *Dr. Rika Spungin*	*The Wright Group*	*2003*

<u>Websites</u>

- **Bridges Family Support: https://www.mathlearningcenter.org/families/bridges2**
- **Connecticut Core Standards for Mathematics:**
  http://www.corestandards.org/Math

Grade 1 Vocabulary

Add	Digit	Minus	Tally mark
Addend	Digital clock	Minute	Ten
Additive identity property of 0	Doubles	Minute hand	Tens
Alike	Doubles minus 1	More	Three dimensional shape
Analog clock	Doubles plus 1	More than	Trapezoid
Associative property of addition	Equal	Most	Triangle
Attribute	Equal parts	Number	True
Bar graph	Equal shares	Number line	Two-dimensional shape
Bar model (similar to add/subtract using number line)	Equal sign	Numeral	Unequal parts
Category	Equation	Object	Unequal shares
Circle	Expression	Ones	Unit
Closed shape	Face	Order	Vertex
Column	Fact family	Partition	Vertices
Commutative property of addition	False	Picture graph	Whole
Compare	Fewer	Place value	Zero
Compose	Fewest	Plus	
Composite shape	Flat surface	Quarter circle	
Cone	Fourths	Quarter of	
Count	Fourth of	Rectangle	
Count back	Greater than	Rectangular prism	
Count on	Half circle	Related facts	
Count up	Half hour	Rhombus	
Cube	Half of	Row	
Curved surface	Half past	Shorter	
Cylinder	Halves	Shortest	
Data	Hexagon	Side	
Date	Hour	Solid shape	
Day	Hour hand	Sort	
Decompose	Hundred	Sphere	
Difference	Is the same as	Square	
Different	Length	Subtract	
	Less than	Sum	
	Longer	Take away	
	Longest	Taller	
	Make ten	Tallest	
	Measure	Tally chart	

RUBRICS

Included in Investigations in Number Data and Space Teacher Edition

RESOURCE FILE/ APPENDICES

- *Connecticut Core State Standards for Mathematics*
- *Mathematical Practices Poster*
- *Technology Competency Standards*
- *Grade 1 Report Card*
- *Grade 1 Pacing Guides*
- *Grade 1 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 - 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 $8 + ? = 11$, $5 = \square - 3$, $6 + 6 = \square$.

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:

   a. 10 can be thought of as a bundle of ten ones — called a "ten."

   b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

   c. 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.

<mark>Measurement and Data</mark> - 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.

<mark>Geometry</mark> - 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.

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.