

TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

Mathematics

Grade 2

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New resources identified in BLUE

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Grade 2 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 2, instructional time should focus on four critical areas:

- 1. Extending understanding of base-ten notation*
- 2. Building fluency with addition and subtraction*
- 3. Using standard units of measure*
- 4. Describing and analyzing shapes*

GOALS: Major Focus Areas for Grade 2 Mathematics

1. Extending understanding of base-ten notation

Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones).

2. Building fluency with addition and subtraction

Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.

3. Using standard units of measure

Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.

4. Describing and analyzing shapes

Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding attributes of two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

Grade 2 Mathematics: Trimester 1 (61 days)

Unit Name: Grade 2 Trimester 1			
<p>Content and Skills</p> <p>Mathematical Practices: See Addendum for Mathematical Practices Poster</p> <p>Quantity, Measurement, and Data:</p> <ul style="list-style-type: none"> ▪ Measure and estimate lengths in standard units. ▪ Relate addition and subtraction to length. ▪ Work with time and money. <p>Numeration, Operations, and Algebraic Thinking:</p> <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ▪ Represent and solve problems involving addition and subtraction. ▪ Add and subtract within 20. ▪ Work with equal groups of objects to gain foundations for multiplication. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ▪ Understand place value. ▪ Use place value understanding and properties of operations to add and subtract. <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) ▪ 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? 			
<p style="text-align: center;">Common Core State Standards for Mathematics</p> <p style="text-align: center;"><i>(See appendix for complete description)</i></p>	<p style="text-align: center;">Time Allotment</p>	<p style="text-align: center;">Assured Learner Activities</p>	<p style="text-align: center;">Assessment</p>
<p>2.OA.1 2.MD.1 2.OA.2 2.MD.2 2.NBT.1 2.MD.3 2.NBT.2 2.MD.4 2.NBT.3 2.MD.5 2.NBT.4</p>	<p>70 minutes daily per Trumbull Board of Education Policy # 6112.2</p>	<ul style="list-style-type: none"> ▪ Great Minds: Eureka Math ▪ Fact Fluency Practice 	<ul style="list-style-type: none"> ▪ Classroom mathematical discourse ▪ Eureka Assessments ▪ i-Ready Assessment
<p style="text-align: center;">Technology Competency Standards</p> <p style="text-align: center;"><i>(See appendix for complete description)</i></p>			
<p>2. Communicate and Collaborate 5. Digital Citizenship</p>			

Grade 2 Mathematics: Trimester 2 (60 Days)

Unit Name: Grade 2 Mathematics: Trimester 2			
<p>Content and Skills</p> <p>Mathematical Practices: See Addendum for Mathematical Practices Poster</p> <p>Quantity, Measurement, and Data:</p> <ul style="list-style-type: none"> ▪ Measure and estimate lengths in standard units. ▪ Relate addition and subtraction to length. ▪ Work with time and money. <p>Numeration, Operations, and Algebraic Thinking:</p> <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ▪ Represent and solve problems involving addition and subtraction. ▪ Add and subtract within 20. ▪ Work with equal groups of objects to gain foundations for multiplication. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ▪ Understand place value. ▪ Use place value understanding and properties of operations to add and subtract. <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
2.OA.1 2.OA.3 2.OA.4 2.NBT.1 2.NBT.2 2.NBT.3 2.NBT.4	2.NBT.5 2.NBT.6 2.NBT.7 2.NBT.8 2.NBT.9 2.G.2	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<ul style="list-style-type: none"> ▪ Great Minds: Eureka Math ▪ Fact Fluency Practice
Technology Competency Standards <i>(See appendix for complete description)</i>			
2. Communicate and Collaborate 5. Digital Citizenship			<ul style="list-style-type: none"> ▪ Classroom mathematical discourse ▪ Eureka Assessments ▪ i-Ready Assessment

Grade 2 Mathematics: Trimester 3 (60 Days)

Unit Name: Grade 2 Mathematics: Trimester 3				
<p>Content and Skills</p> <p>Mathematical Practices: See Addendum for Mathematical Practices Poster</p> <p>Quantity, Measurement, and Data:</p> <ul style="list-style-type: none"> ▪ Measure and estimate lengths in standard units. ▪ Relate addition and subtraction to length. ▪ Work with time and money. <p>Numeration, Operations, and Algebraic Thinking:</p> <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ▪ Represent and solve problems involving addition and subtraction. ▪ Add and subtract within 20. ▪ Work with equal groups of objects to gain foundations for multiplication. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ▪ Understand place value. ▪ Use place value understanding and properties of operations to add and subtract. <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 Major Work of Trimester <i>(See appendix for complete description)</i>		Time Allotment	Assured Learner Activities	Assessment
2.NBT.2 2.NBT.5 2.NB.6 2.NBT.8 2.MD.1 2.MD.2 2.MD.3 2.MD.4 2.MD.5	2.MD.6 2.MD.7 2.MD.8 2.MD.9 2.MD.10 2.G.1 G.2.2 2.G.3	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<ul style="list-style-type: none"> ▪ Great Minds: Eureka Math ▪ Fact Fluency Practice 	<ul style="list-style-type: none"> ▪ Classroom mathematical discourse ▪ Eureka Assessments ▪ i-Ready Assessment
Technology Competency Standards <i>(See appendix for complete description)</i>				
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.

TEXTS

<i>Title</i>	<i>Author</i>	<i>Publisher</i>	<i>Date of Publication</i>
Eureka Math	▪ <i>Great Minds</i>	<i>Great Minds</i>	<i>2015</i>

SUPPLEMENTARY MATERIALS/ RESOURCES/ TECHNOLOGY

Supplementary Materials

Manipulatives provided for each Grade 2 classroom.

- Manipulative materials
 - Coins and bills
 - Clock teacher demo (analog and digital)
 - Clock student
 - 1 Inch color tiles
 - Dice
 - Geoboards
 - Geoblocks
 - Hundreds Board
 - Hundred number chart
 - Pattern blocks
 - Number cubes
 - Number line
 - Ruler
 - Snap or Unifix cubes
 - Tape measures

Additional Resources:

<i>Title</i>	<i>Author</i>	<i>Publisher</i>	<i>Date of Publication</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>

Websites:

- **Common Core State Standards for Mathematics:**
<http://www.corestandards.org/Math>
- **Smarter Balanced Assessment Consortium:**
<http://www.smarterbalanced.org/>

Grade 2 Vocabulary:

A.M.	Difference	Line plot	Repeated addition
Add	Digit	Making ten	Rhombus
Addend	Digital clock	Measuring tape	Row
Additive identity property of 0	Dime	Meter	Ruler
Analog clock	Dollar	Meter stick	Side
Angle	Doubles	Metric system	Skip count
Array	Edge	Midnight	Solid shape
Associative property of addition	Equal	Minute	Sort
Attribute	Equal groups	Minute hand	Sphere
Bar graph	Equal parts	Money	Square
Bar model (number line for addition and subtraction)	Equal shares	More	Standard form
Base ten numeral form	Equation	More than	Subtract
Base ten numerals	Estimate	Nickel	Sum
Category	Even number	Noon	Survey
Cent	Expanded form	Number	Tally chart
Centimeter	Expression	Number line	Tally mark
Circle	Face	Number name	Tens
Closed shape	Fact family	Numeral	Third of
Column	Fewer	Odd number	Thirds
Commutative property of addition	Foot	Ones	Thousand
Compare	Fourth of	P.M.	Three-dimensional shape
Compensation	Fourths	Pair	Time
Compose	Greater than	Partition	Trapezoid
Cone	Half hour	Pattern	Triangle
Count back	Half of	Penny	Two-dimensional shape
Count on	Half past	Pentagon	Unit
Count up	Halves	Picture graph	Vertex
Cube	Hexagon	Place value	Vertices
Customary system	Horizontal bar graph	Quadrilateral	Vertical bar graph
Cylinder	Hour	Quarter	Whole
Data	Hour hand	Quarters	Whole numbers
Decimal point	Hundred	Quarter of	Word form
Decompose	Hundreds	Quarter past	Yardstick
	Inch	Quarter hour	
	Key	Rectangle	
	Length	Rectangular prism	
	Less than	Regroup	
	Line	Related facts	

RUBRICS

Included in Investigations in Number Data and Space - Teacher Only Edition

RESOURCE FILE/ APPENDICES

- *Connecticut Core State Standards for Mathematics*
- *Mathematical Practices Poster*
- *Technology Competency Standards*
- *Grade 2 District Basic Facts Plan*
- *Grade 2 Report Card*
- *Grade 2 Pacing Guides*
- *Grade 2 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 – 2nd Grade Standards

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

2.OA.A.1: Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (Note: See Glossary, Table 1.)

Add and subtract within 20.

2.OA.B.2: Fluently add and subtract within 20 using mental strategies. (Note: See standard 1.OA.6 for a list of mental strategies). By end of Grade 2, know from memory all sums of two one-digit numbers.

Work with equal groups of objects to gain foundations for multiplication.

2.OA.C.3: Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.

2.OA.C.4: Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Number and Operations in Base Ten - Understand place value.

2.NBT.A.1: Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

a. 100 can be thought of as a bundle of ten tens — called a “hundred.”

b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

2.NBT.A.2: Count within 1000; skip-count by 5s, 10s, and 100s.

2.NBT.A.3: Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

2.NBT.A.4: Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

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

2.NBT.B.5: Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

2.NBT.B.6: Add up to four two-digit numbers using strategies based on place value and properties of operations.

2.NBT.B.7: Add and subtract within 1000, 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. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.NBT.C.8: Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

2.NBT.B.9: Explain why addition and subtraction strategies work, using place value and the properties of operations. (Note: Explanations may be supported by drawings or objects.)

Measurement and Data - Measure and estimate lengths in standard units.

2.MD.A.1: Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

2.MD.A.2: Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

- 2.MD.A.3: Estimate lengths using units of inches, feet, centimeters, and meters.
- 2.MD.A.4: Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

Relate addition and subtraction to length.

- 2.MD.B.5: Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
- 2.MD.B.6: Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

Work with time and money.

- 2.MD.C.7: Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
- 2.MD.C.8: Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

Represent and interpret data.

- 2.MD.D.9: Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
- 2.MD.D.10: Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph. (Note: See Glossary, Table 1.)

Geometry - Reason with shapes and their attributes.

- 2.G.A.1: Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. (Note: Sizes are compared directly or visually, not compared by measuring.) Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- 2.G.A.2: Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
- 2.G.A.3: Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same 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

Manipulative Materials for Grade 2

- **Coins set and bills**
- **Clock (teacher demo) student clocks**
- **1 Inch color tiles**
- **Counting craft sticks**
- **Dice (blank with stickers)**
- **Dice (dot 1-6)**
- **Geoboards (with rubber bands)**
- **Geoblocks**
- **Hundred boards**
- **Hundred number chart**
- **Pattern blocks**
- **Number cubes**
- **Number line**
- **Ruler, meter stick, yard stick**
- **Snap cubes**