

MATH
CURRICULUM
GRADE 2



Newtown Public Schools,
Newtown, CT

September 2009

NEWTOWN PUBLIC SCHOOLS MISSION STATEMENT

The mission of the Newtown Public Schools a partnership of students, families, educators and community, is to

INSPIRE EACH STUDENT TO EXCEL

in attaining and applying the knowledge, skills and attributes that lead to personal success while becoming a contributing member of a dynamic global community. We accomplish this by creating an unparalleled learning environment characterized by:



- High expectations
- Continuous improvement
- Quality instruction
- Civic responsibility

Quality education is possible if we all agree on a common purpose as we work together to continuously improve the teaching and learning process. We believe that ALL CHILDREN CAN AND WILL LEARN WELL. The system strives to establish high standards for our students, faculty, and staff through the curriculum documents. Mastery of this curriculum depends on the effort and persistence of the learner, the support of the parents, and the knowledge, skills and persistence of the staff.

In order for our students to reach the goals of cognitive achievement, students must learn how to use the process skills of decision-making, problem solving, and critical thinking. Students need to take responsibility for their learning by becoming self-directed, active participants in the educational process.

We must continuously work to improve the learning environment and the curriculum. To improve, we must analyze what we believe, what we know, and what we want before we take action to reach these goals.

It is the responsibility of the staff of the Newtown Public Schools to provide all children with the opportunity to learn well. We believe that the students and staff will be more productive when basic human needs are met. These needs include: Belonging, the need for positive relationships; Competence, the need to be successful; Freedom, the need to have control over decisions; Fun, the need to enjoy life; and Survival, the need for shelter, food and good health. Living and working with others enriches the experiences of students. Positive self-esteem brings productivity and personal satisfaction to students and to staff. This esteem can be nurtured through opportunities to self-evaluate constructively and see performance improve as a result of work.

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

THE SECOND-GRADE CHILD:

- Enjoys games and working with manipulatives.
- Likes working alone and slowly.
- Needs to have closure and complete an assigned task.
- Relies on the teacher for help.

ALGEBRAIC REASONING

- Explores the pattern in part-whole activities that establishes connections to addition and subtraction.
- Recognizes that the = symbol in equations means a relationship, not just instructions to compute.
- Describes simple ratios in patterns using models or pictures.
- Begins to translate verbal information into algebraic expressions.

NUMERICAL AND PROPORTIONAL REASONING

- Uses base-10 models and pictures to show the quantitative value of a number.
- Begins to see a group of 10 as a single set, named “a ten.”
- Needs many experiences with and without models over a long period of time to develop a deep understanding of large numbers.
- Masters basic addition and subtraction facts by using their inverse relationship, efficient strategies and the commutative property (addition only).
- Uses place value charts and models to further develop the written number name and number symbols.
- Uses number patterns, pictures, arrays and other models to explore multiplication and division.
- Begins to estimate using number meanings, models, basic facts, and mental computation, rather than rules for rounding.
- Represents the relationship between the equal-size pieces and the whole or set using models.
- Develops an understanding of fractional parts and the relationship between the numerator and the denominator using models, familiar objects and fraction sentences.
- Uses benchmark numbers to develop patterns to explore estimation strategies.

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

GEOMETRY AND MEASUREMENT

- Can compose and decompose two-dimensional shapes, e.g., combining a square and a triangle to make a pentagon or finding two congruent triangles in a rectangle.
- Begins to quantify attributes of objects
- Has the ability to measure length as an iteration of units.
- Recognizes the relationship between the size of the unit and the number of units needed to present a given length.
- Understands the need for standard units of measure and uses measuring instruments such as rulers, scales and clocks.
- Begins to read an analog clock using the skill of “reading a meter” with a pointer on a numbered scale.

WORKING WITH DATA

- Begins with real or hands-on graphing experiences and moves to representational and symbolic graphing.
- Builds decision making along several dimensions at the same time:
 1. What question are we answering?
 2. What is a good attribute? Why am I choosing this unit?
 3. What is an appropriate procedure?
 4. What instrument is needed to count the units? (Jensen, p. 180)
- Needs ongoing experiences of increasing complexity in organization and summarization through graphing.
- Records information through multiple graphic representations (e.g., two column graph, Venn diagram, pictograph).

Newtown Public Schools Math Curriculum – Grade 2

ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS

Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

Central Understanding: Relationships shown through number patterns extend the understanding of number properties and operations.

Background: Translating the procedures and rules that govern patterns into mathematical expressions establishes the connection of patterns to algebraic representations. Conceptual understanding and procedural fluency are intertwined and equally necessary to support the examination of patterns. The exploration of the structures of our number system leads to the ability to discover relationships and make generalizations. These generalizations make apparent the connections between and among numeric and geometric concepts.

NUMERICAL AND PROPORTIONAL REASONING

Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

Central Understanding: In the base-10 numeration system, number relationships can be described and represented in a variety of ways to support conceptual understanding and computation.

Background: Base-10 numeration includes counting in units and multiple of ones, tens and hundreds as representation of one quantity or number. Many of the ideas that contribute to computational fluency and flexibility with numbers are extensions of how numbers are related to 10. Decomposing and composing a number leads to efficient ways to think about quantities and computation. When numbers are taken apart and recombined displaying different relationships, basic facts are easier to remember. Similarly, the inverse relationship of addition and subtraction are reinforced.

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

GEOMETRY AND MEASUREMENT

Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

Central Understanding: Attributes can be compared by applying measurement to an object, situation or event.

Background: Measuring units depends upon and strengthens understanding of number through counting and comparison. Standard units of measurement become common referents for identification and description of objects. Geometric shapes and solids are identified, composed and decomposed based upon attributes and measurement.

WORKING WITH DATA: PROBABILITY AND STATISTICS

Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

Central Understanding: The same information can be organized in different ways.

Background: The gathering of data should be based on student-generated questions. The question to be answered must be formulated clearly to direct an investigation. In order to make data collection meaningful, it is necessary to identify an attribute or characteristic that can be measured. Different classifications of the same attributes will produce different organizations of the information or data collected.

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS

Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations	Resources
<p>1.1 Understand and describe patterns and functional relationships.</p>	<p>Sort, classify and order objects and numbers in more than one way and by one and two attributes and describe the rule used. Use attributes such as size, shape, color, texture, orientation, position and use; and characteristics such as symmetry and congruence.</p> <p>Recognize, extend, and create repeating, growing, number patterns; e.g., skip counting by 2s, 5s, 10s, 100s, odd/even, counting on by 10; and one and two attribute patterns. Describe the pattern and the rule used to make it.</p> <p>Replicate the pattern using a different representation, e.g., letters to numbers.</p> <p>Use patterns and the rules that describe the patterns to identify a missing object, objects with common or different attributes, and the complement of a set of objects.</p> <p>Analyze and describe observable changes in patterns using language that describes number characteristics and qualitative characteristics such as attributes, orientation and position.</p>	<p>17A. Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons.</p> <p>22A. Extend or complete patterns, or identify rules using numbers and attributes.</p> <p>22B. Extend or complete patterns and state rules using numbers and attributes.</p> <p>24A. Identify objects that are the same or different by one attribute.</p> <p>24B. Sort objects into two groups by a common attribute.</p> <p>6A. Add and subtract facts to 18.</p> <p>6B. Multiply and divide by 2, 5 and 10.</p> <p>17A. Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons.</p> <p>22A. Extend or complete patterns, or identify rules using numbers and attributes.</p> <p>22B. Extend or complete patterns and state rules using numbers and attributes.</p> <p>24A. Identify objects that are the same or different by one attribute.</p> <p>24B. Sort objects into two groups by a common attribute.</p> <p>25A. Solve extended numerical and statistical problems.</p> <p>22A. Extend or complete patterns, or identify rules using numbers and attributes.</p> <p>22B. Extend or complete patterns and state rules using numbers and attributes.</p>	

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS

Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations	Resources
<p>1.2 Represent and analyze quantitative relationships in a variety of ways.</p>	<p>Model real-life situations that represent the addition and subtraction of whole numbers with objects, pictures, symbols and open sentences.</p>	<p>5B. Identify the appropriate operation or number sentence to solve a story problem.</p> <p>5C. Write story problems from addition or subtraction number sentences.</p> <p>6A. Add and subtract facts to 18.</p> <p>7A. Add and subtract one- and two-digit whole numbers without regrouping.</p> <p>7B. Add one- and two-digit whole numbers with regrouping.</p> <p>9A. Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping).</p> <p>9B. Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information.</p> <p>25A. Solve extended numerical and statistical problems.</p>	
<p>1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.</p>	<p>Demonstrate an understanding of equivalence or balance of sets using objects, models, diagrams, numbers, whole number relationships (operations) and the equals sign, e.g., $2 + 3 = 5$ is the same as $5 = 2 + 3$ and the same as $4 + 1 = 5$.</p>	<p>6A. Add and subtract facts to 18.</p> <p>7A. Add and subtract one- and two-digit whole numbers without regrouping.</p> <p>7B. Add one- and two-digit whole numbers with regrouping.</p> <p>9A. Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping).</p> <p>9B. Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information.</p> <p>25A. Solve extended numerical and statistical problems.</p>	

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS

Vocabulary: add, subtract, equal, odd, even, ratio, core element, repeat, mirror, sort, classify, extend, analyze, equity symbol, relationships, pattern, growing pattern, equivalence, properties

Resources: See http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/math/MMC_2008.pdf

Electronic Resources:

Wilson A. Bently <http://snowflakebently.com/index.htm>

Cool Math for Kids <http://www.coolmath4kids.com>

Internet 4 Classrooms http://www.internet4classrooms.com/skills_2nd.htm#math

Score Mathematics <http://score.kings.k12.ca.us/number.sense.html>

Math Forum <http://mathforum.org/paths/fractions/e.fraclessons.html>

Apples for the Teacher <http://www.apples4theteacher.com/math.html>

National Library of Virtual Manipulatives http://nlvm.usu.edu/en/nav/grade_g_1.html

Illuminations <http://illuminations.nctm.org/>

One-Difference Train – Goals 2000

Problem Solving – Goals 2000

Teacher References:

“Algebra in the PreK-2 Curriculum?” *Teaching Children Mathematics* NCTM Sept. 2005

Navigating through Algebra – Pre-K-2 NCTM

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS

Children’s Literature:

The 329th Friend by Marjorie Weinman Sharmat

Snowflake Bentley by Jacqueline Briggs Martin

Sam Johnson and the Blue Ribbon Quilt by Lisa Campbell Ernst

The Doorbell Rang by Pat Hutchins

A Remainder of One by Elinor J. Pinczes

How Many Feet in the Bed? by Diane Johnston Hamm

One Hundred Ways to Get to 100 by Jerry Pallotta

How the Second Grade Got \$8,205,50 to Visit the Statue of Liberty by Nathan Zimelman

Gator Pie by Louise Mathews

Only One by Marc Harshman

Arctic Fives Arrive by Elinor J. Pinczes

One Less Fish by Kim Michelle Toft

From One to One Hundred by Teri Sloat

Two of Everything by Lily Toy Hong

100 Days of Cool by Stuart J. Murphy

Notes:

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

NUMERICAL AND PROPORTIONAL REASONING

Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations

State Framework	Grade-Level Expectations	CMT Correlations	Resources
<p>2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.</p>	<ol style="list-style-type: none"> 1. Locate, label, compare, and order whole numbers up to 1,000 using pictures, place value models, number lines, and benchmarks (including rounding to the nearest 10) of 0, 10 and 100, including naming the number that is 1, 10 or 100 more or less than a given number. 2. Represent whole numbers up to 1,000 by modeling and writing numbers in expanded forms, e.g., $37 = 30 + 7$, and regrouped forms, e.g., $20 + 17 = 37$, and use the forms to support computational strategies. 3. Represent multiplication and division (with factors of 1, 2, 5 and 10) using a variety of models and strategies such as arrays, pictures, skip counting, extending number patterns, and repeated addition and subtraction; describe the connection between multiplication and division. 4. Use a variety of models and familiar objects to compare, order and estimate parts of a whole (e.g. $2/3$ or $3/4$) or of a set (e.g. two out of three stars are shaded so $2/3$ of the stars are shaded). 5. Use a variety of models to represent and describe parts of groups as unit fractions $1/2$, through Error! Bookmark not defined.$1/10$. 6. Estimate and determine $1/2$, $1/3$, $1/4$ of a small group of up to 20 objects, such as finding $1/2$, $1/3$, $1/4$ of 12 cookies. 7. Investigate and describe addition with like denominators using models, and write matching fraction sentences ($1/3 + 1/3 = 2/3$ or $2/4 + 1/4 = 3/4$). 8. Describe ratios in terms of the linear patterns that develop from the relationships between quantities, e.g., In a pattern of green, green, red blocks there are always two green blocks for one red block. 	<p>1A. Solve problems involving one more/less or 10 more/less using two-digit numbers.</p> <p>1B. Identify alternative forms of expressing 3-digit whole numbers using expanded notation.</p> <p>1C. Identify alternative forms of expressing 2-digit whole numbers using regrouping.</p> <p>1D. Use place value concepts to identify and compare the magnitude and value of digits in two- and three-digit numbers.</p> <p>2A. Relate whole numbers to pictorial representations of base ten blocks and vice versa.</p> <p>2B. Identify fractional parts of regions and sets using pictures and vice versa.</p> <p>2C. Label and/or shade fractional parts of regions and sets.</p> <p>2D. Identify points representing two- and three-digit whole numbers on a number line and vice versa.</p> <p>4A. Order two- and three-digit whole numbers</p> <p>4B. Describe magnitude of two- and three-digit whole numbers.</p> <p>4C. Round two-digit whole numbers in context.</p> <p>11A. Identify a reasonable estimate to a problem.</p> <p>25A. Solve extended numerical and statistical problems.</p> <p>23A. Solve simple one-step algebraic equations involving addition, subtraction and fact families.</p>	

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

NUMERICAL AND PROPORTIONAL REASONING			
Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations			
State Framework	Grade-Level Expectations	CMT Correlations	Resources
<p>2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.</p>	<p>9. <i>Count whole numbers to 1,000 and beyond.</i></p> <p>10. <i>Count on by tens from a given amount, e.g., 17, 27, 37, etc.</i></p> <p>11. <i>Read and write numerals up to 1,000.</i></p> <p>12. Skip count by twos, fives, tens and hundreds to 1,000 and beyond.</p> <p>13. Determine whether a set of objects has an odd or even number of items by pairing objects and creating arrays.</p> <p>14. Create word /story problems and write and solve two- and three-digit number sentences that reflect contextual situations and real-world experiences involving addition and subtraction. Construct and solve open sentences, e.g., $\square + 5 = 11$. Solve the problems using a variety of methods including models, pictures, pencil and paper, estimation and mental computation, and describe the reasoning or strategies used.</p> <p>15. Solve problems using addition and subtraction facts involving sums and differences to 20 with flexibility and fluency</p> <p>16. Add and subtract two-digit numbers with and without regrouping using a variety of strategies including models.</p>	<p>6A. Add and subtract facts to 18.</p> <p>7A. Add and subtract one- and two-digit whole numbers without regrouping.</p> <p>9A. Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping).</p> <p>9B. Solve simple story problems involving addition (with/without regrouping) or subtraction (without regrouping) with extraneous information.</p> <p>5B. Identify the appropriate operation or number sentence to solve a story problem.</p> <p>5C. Write story problems from addition or subtraction number sentences.</p> <p>10A. Identify the best expression to find an estimate.</p> <p>11A. Identify a reasonable estimate to a problem.</p> <p>2A. Relate fractions and decimals to pictorial representations and vice versa.</p> <p>2B. Relate fractions of regions and sets to pictures and vice versa.</p> <p>2C. Label and/or shade fractional parts of regions and/or sets.</p>	

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

NUMERICAL AND PROPORTIONAL REASONING Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations			
State Framework	Grade-Level Expectations	CMT Correlations	Resources
	<p>17. Determine when an estimate for a problem involving two- and three-digit numbers is appropriate or when an exact answer is needed.</p> <p>18. Use a variety of strategies to estimate solutions and to determine if a solution to a computation or word problem reflecting real-world experiences involving addition and subtraction of two- and three-digit whole numbers is reasonable.</p> <p>19. <i>Determine and compare the value of a set of pennies, nickels, and dimes; investigate quarters and half dollars.</i></p> <p>20. Count, compare and trade sets of pennies, dimes and dollars up to \$10.00</p>	<p>3A. Relate equivalent fractions to pictorial representations.</p> <p><i>*8A. Add and subtract fractions with like denominators.</i></p> <p>25A. Solve extended numerical and statistical problems.</p> <p><i>*Indicates Grade 4 CMT</i></p>	

NUMERICAL AND PROPORTIONAL REASONING

Vocabulary: same, equal, digit, odd, even, compare, skip counting, grouping, regroup, trade, 10-frame, place value, hundreds, tens, ones, singles, a ten, a hundred, more than, less than, 10 more, 10 less, hundred more, hundred less, close to, closer to, about, almost, referent, shorter, longer, taller, inch, ruler, centimeter, meter stick, unit, part-whole, add, subtract, sum, difference, fraction, equivalent, unit fraction, fractional part, reasonable, estimate, basic fact, multiplication, array, division, divide, split, equal sized groups, half hour, quarter hour, timeline

Resources: See http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/math/MMC_2008.pdf

Electronic Resources:

Apples and More <http://www.urbanext.uiuc.edu/apples/index.html>

Michigan Apples <http://www.michiganapples.com/index/asp?Loc=2&Loc2=5>

Best Apples <http://www.bestapples.com/varieties/index.shtml>

Electronic Abacus <http://illuminations.nctm.org/ActivityDetail.aspx?ID=8>

Ten Frame <http://illuminations.nctm.org/ActivityDetail.aspx?ID=75>

Comparing Connecting Cubes <http://illuminations.nctm.org/LessonDetail.aspx?id=U41>

In On the Ground Floor <http://www.crativille.org/groundfloor/index.htm>

A counting lesson for two digit numbers <http://www.sasked.gov.sk.ca/docs/elemath/gr2lessp.html>

Different Ways – Goals 2000

In Only a Minute – Goals 2000

Going to the Fair – Goals 2000

How Much Money – Goals 2000

Amazing Equations – Goals 2000

How Many Blocks – Goals 2000

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

NUMERICAL AND PROPORTIONAL REASONING

Teacher References:

Research Ideas for the Classroom: Early Childhood Mathematics edited by Robert J. Jenson

Elementary and Middle School Mathematics, Teaching Developmentally by John Van de Walle, 4th and 5th editions

Children’s Mathematics: Cognitively Guided Instruction by T.P. Carpenter, E. Fennema, M.L. Franke, L. Levi, and S. Empson

Problem-Solving Lessons, Grades 1-6 by Marilyn Burns

Children’s Literature:

Annie’s One to Ten by Annie Owen

Math Potatoes by Greg Tang

One Watermelon Seed by Celia Barker Lottridge

Anno’s Counting House by Mitsumasa Anno

Twelve Ways to Get to Eleven by Eve Merriam

The Doorbell Rang by Pat Hutchins

Six Dinner Sid by Inga Moore

Each Orange Had 8 Slices by Paul Giganti

Domino Addition by Lynette Long

My Little Sister Ate One Hare by Bill Grossman

The King’s Commissioners by Aileen Friedman

Ten for Dinner by Jo Ellen Bogart

A Chair for My Mother by Vera B. Williams

100th Day Worries by Margery Cuyler

The Coin Counting Book by Rozanne Lanczak Williams

My First 1,2,3 Book by Sebastian Cochran

One Tortoise, Ten Wallabies: A Wildlife Counting Book by Jakki Wood

Classroom Materials: items from science or social studies in groups from 10 to 200, collections, base-ten blocks, inter-connecting blocks, pattern blocks, coins, calendars, hundreds chart, number lines, number cards, small cups or containers, place value mats, place value charts, small 10-frame cards

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

GEOMETRY AND MEASUREMENT			
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.			
State Framework	Grade-Level Expectations	CMT Correlations	Resources
3.1 Use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.	<ol style="list-style-type: none"> 1. Identify, describe (use terms parallel lines, square corners, vertices, faces, edges...) and draw polygons (triangles, quadrilaterals including trapezoids and rhombuses, pentagons and hexagons), solids, and other familiar two- and three-dimensional objects in the environment. 2. Compare and sort familiar polygons, solids, and other two- and three- dimensional objects in the environment. 3. Construct polygons, solids and other two- and three-dimensional objects using a variety of materials and create two-dimensional shapes and designs with one or more lines of reflective symmetry (lines that divide the shape or design into two congruent parts). 	<p>17A. Identify and recognize two-dimensional geometric shapes and figures, including number of angles and sides of polygons.</p> <p>17B. Draw two-dimensional geometric shapes and figures.</p> <p>25A. Solve extended numerical and statistical problems.</p>	
3.2 Use spatial reasoning, location and geometric relationships to solve problems.	<ol style="list-style-type: none"> 4. Investigate and predict the result of putting together and taking apart two- and three-dimensional shapes in the environment e.g. use objects to find other shapes that can be made from three triangles or a rectangle and a triangle. 	<p>15A. Estimate lengths and areas by comparing.</p> <p>17B. Draw two-dimensional geometric shapes and figures.</p> <p>25A. Solve extended numerical and statistical problems.</p>	
3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.	<ol style="list-style-type: none"> 5. <i>Know the months of the year in order and locate dates, days, weeks and months on a calendar. Use the information to write and solve problems involving calendars.</i> 6. <i>Solve problems involving telling time, including estimating and measuring the length of time needed to complete a task, to the half-hour using analog and digital clocks. Explore time to the quarter hour.</i> 	<p>14A. Tell time to the nearest hour, half-hour and quarter-hour using analog and digital clocks.</p> <p>14B. Solve problems involving time, elapsed time (15-minute increments) and calendars.</p> <p>25A. Solve extended numerical and statistical problems.</p>	

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

GEOMETRY AND MEASUREMENT			
Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.			
State Framework	Grade-Level Expectations	CMT Correlations	Resources
	<p>7. Use measurement tools such as thermometers to measure temperature, basic rulers to measure length to the nearest half-inch or centimeter, and balance scales to measure weight /mass in grams.</p> <p>8. Use nonstandard referents and standard benchmarks to estimate and measure the following:</p> <ul style="list-style-type: none"> • length (to the nearest inch, half-inch, foot, yard, centimeter or meter); explore perimeter • area (in square inches); • capacity (in liters and cups); • weight (in grams); • temperature; and • volume (using water or sand). <p>9. Describe the strategy used to determine an estimate and determine if the estimate is reasonable.</p> <p>10. <i>Describe the relationships between centimeter and meter and among inch, foot and yard.</i></p>	<p>15A. Estimate lengths and areas by comparing.</p> <p>16A. Measure lengths to the nearest inch or centimeter.</p> <p>16B. Draw lengths to the nearest inch or centimeter.</p> <p>16C. Identify appropriate customary or metric units of measure for a given situation (inches, feet, centimeters and meters).</p> <p>25A. Solve extended numerical and statistical problems.</p>	

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

GEOMETRY AND MEASUREMENT

Vocabulary: measure, minutes, hours, days, week, month, calendar, clock, digital, analog, data, length, area, weight, capacity, volume, estimate, ruler, thermometer, scale, inches, centimeters, foot, tally marks, the months of the year

Resources: See http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/math/MMC_2008.pdf

Electronic Resources:

Tour of Measurement <http://www.mathforum.org>

Can You Measure Up? <http://artsedge.kennedy-center.org/content/3801>

The Shape of Sand <http://web.archive.org/web/20041019125446/www.galaxy.net!/k12/structure/sand.shtml>

Measuring Our Classroom – Goals 2000

Two- and Three- Dimensional Riddles – Goals 2000

Is It 15? – Goals 2000

Teacher References:

NCTM Measurement Standards K-2

Engaging Young Children in Mathematics by Douglas H. Clements

Adding It Up by National Research Council

Elementary and Middle School Mathematics by John Van De Walle

“Dumpling Soup: Exploring Kitchens, Cultures, and Mathematics” by N.L. Smith *Teaching Children Mathematics* 1999 Vol. 6

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

GEOMETRY AND MEASUREMENT

Children’s Literature:

How Big is A Foot? by Rolf Myller

Inch by Inch by Leo Lionni

Super Sand Castle Saturday by Stuart J. Murphy

A Drop of Water by Walter Wick

Cubes, Cones, Cylinders, and Spheres by Tana Hoban

The Great Graph Contest by Loreen Leedy

Clocks and More Clocks by Pat Hutchins

Is the Blue Whale the Biggest Thing There Is? by Robert E. Wells

Notes:

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

WORKING WITH DATA: PROBABILITY AND STATISTICS

Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.

State Framework	Grade-Level Expectations	CMT Correlations	Resources
4.1 Collect, organize and display data using appropriate statistical and graphical methods.	<ol style="list-style-type: none"> 1. Pose questions that can be used to guide data collection, organization and representation. 2. Collect and systematically organize and represent the data that answer the questions using lists, charts and tables, tallies, glyphs (coded pictures), picture graphs and bar graphs. 	<p>19A. Identify correct information from tables, bar graphs, pictographs and charts.</p> <p>19B. Create bar graphs and pictographs from data in tables and charts.</p> <p>25A. Solve extended numerical and statistical problems.</p>	
4.2 Analyze data sets to form hypotheses and make predictions.	<ol style="list-style-type: none"> 3. Describe data that have been organized and make comparisons using terms such as largest, smallest, most often, least often, greater than, less than, equal, fewer and more. 4. Determine patterns and make predictions from data displayed in tables and graphs. 	<p>22A. Extend or complete patterns, or identify rules using numbers and attributes.</p> <p>22B. Extend or complete patterns and state rules using numbers and attributes.</p> <p>25A. Solve extended numerical and statistical problems.</p>	
4.3 Understand and apply basic concepts of probability.	<ol style="list-style-type: none"> 5. Describe and explain the likelihood of the occurrence of various events. State possibilities, make predictions and test the predictions in practical situations. 6. Conduct simple probability investigations involving activities of chance and games with number cubes and spinners; record, graph and describe the results of the investigations. 	<p>21A. Identify correct solutions to problems involving elementary notions of probability.</p> <p>25A. Solve extended numerical and statistical problems.</p>	

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WORKING WITH DATA: PROBABILITY AND STATISTICS

Vocabulary: measure, data, length, area, weight, graph, chart, table, picture, graph, bar graph, estimate, scale, inches, centimeters, foot, tally marks, chance, likelihood, predict

Resources: See http://www.sde.ct.gov/sde/lib/sde/pdf/curriculum/math/MMC_2008.pdf

Electronic Resources:

Eye to Eye <http://illuminations.nctm.org/LessonDetail.aspx?ID=L169>

Dealing with Data <http://illuminations.nctm.org/LessonDetail.aspx?id=L297>

Nutrition Explorations <http://www.nutritionexplorations.org>

What’s the Weather? <http://illuminations.nctm.org/LessonDetail.aspx?ID=L196>

Teacher References:

NCTM Measurement Standards K-2

Engaging Young Children in Mathematics by Douglas H. Clements

Adding It Up by National Research Council

Elementary and Middle School Mathematics by John Van De Walle

“Dumpling Soup: Exploring Kitchens, Cultures, and Mathematics” by N.L. Smith *Teaching Children Mathematics* 1999 Vol. 6

Making Sense of Data, in the *NCTM Addenda Series* by Mary Lindquist

NEWTOWN PUBLIC SCHOOLS MATH CURRICULUM – GRADE 2

WORKING WITH DATA: PROBABILITY AND STATISTICS

Children’s Literature:

The Mouse Who Owned the Sun by Sally Derby

A Drop of Water by Walter Wick

Probability by Charles F. Linn

Jump, Frog, Jump! by Robert Kaplan

Is the Blue Whale the Biggest Thing There Is? By Robert E. Wells

Cloudy with a Chance of Meatballs by Judi Barrett

Notes: