MOORESTOWN TOWNSHIP PUBLIC SCHOOLS
MOORESTOWN, NEW JERSEY

Moorestown K-3 Elementary Schools
Mathematics

Mathematics
Grade 2

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Course Description and Fundamental Concepts

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; and (4) describing and analyzing shapes.

(1) 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) 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) 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 an iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.

(4) 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 area, volume, congruence, similarity, and symmetry in later grades.

Grade 2 Overview

1. **Operations and Algebraic Thinking**
   - Represent and solve problems involving addition and subtraction.
   - Add and subtract within 20.
   - Work with equal groups of objects to gain foundations for multiplication.

2. **Number and Operations in Base Ten**
   - Understand place value.
   - Use place value understanding and properties of operations to add and subtract.

3. **Measurement and Data**
   - Measure and estimate lengths in standard units.
   - Relate addition and subtraction to length.
   - Work with time and money.
   - Represent and interpret data.

4. **Geometry**
   - Reason with shapes and their attributes.

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.

Subject/Content Standards
Include grade appropriate subject/content standards that will be addressed

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2.OA Operations and Algebraic Thinking
  A. Represent and solve problems involving addition and subtraction.
    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.
  B. Add and subtract within 20.
    2. Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
  C. Work with equal groups of objects to gain foundations for multiplication.
    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.
    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.

2.NBT Number and Operations in Base Ten
  A. Understand place value.
    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. Count within 1000; skip-count by 5s, 10s, and 100s.
    3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
    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.
  B. Use place value understanding and properties of operations to add and subtract.
    5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
    6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
    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.
    8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
    9. Explain why addition and subtraction strategies work, using place value and the properties of operations.

2.MD Measurement and Data
  A. Measure and estimate lengths in standard units.
    1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
    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.
    3. Estimate lengths using units of inches, feet, centimeters, and meters.
    4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
  B. Relate addition and subtraction to length.
    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.
    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.
  C. Work with time and money.
    7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
    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?
  D. Represent and interpret data.
    10. 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.
    11. 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 problems4 using information presented in a bar graph.

2.G Geometry
  A. Reason with shapes and their attributes.
    1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.5 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
    2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
    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.

Mathematical Practice Standards
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.

21st-Century Skills and Technology Integration (Standard 8)
List appropriate units below for which strands (A through F) will be addressed

Standard 8.1 (K-12)		Educational Technology: *All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.*
Unit Addressed	**Strand Letter**	**Standard Description**
Units 1, 2, 3, 4	**Strand A**	**Technology Operations and Concepts:** *Students demonstrate a sound understanding of technology concepts, systems, and operations.*
Units 1, 2, 3, 4	**Strand B**	**Creativity and Innovation:** *Students demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology.*
	Strand C	**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.*
Units 1, 2, 3, 4	**Strand D**	**Digital Citizenship:** *Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.*
	Strand E	**Research and Information Fluency:** *Students apply digital tools to gather, evaluate, and use information.*

	Strand F	**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.*
Standard 8.2 (K-5)		**Technology Education, Engineering, Design, and Computational Thinking - Programming:** *All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.*
	Strand A	**The Nature of Technology: Creativity and Innovation:** *Technology systems impact every aspect of the world in which we live.*
	Strand B	**Technology and Society:** *Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.*
Units 1, 2	**Strand C**	**Design:** *The design process is a systematic approach to solving problems.*
	Strand D	**Abilities for a Technological World:** *The designed world is the product of a design process that provides the means to convert resources into products and systems.*
Units 1, 2, 3, 4	**Strand E**	**Computational Thinking: Programming:** *Computational thinking builds and enhances problem-solving, allowing students to move beyond using knowledge to creating knowledge.*

Career Ready Practices ([Standard 9](#))
List appropriate units below for which CRPs will be addressed

Unit Addressed	**Standard #**	**Standard Description**
	CRP1	*Act as a responsible and contributing citizen and employee.*
Units 1, 2, 3, 4	**CRP2**	*Apply appropriate academic and technical skills.*
Unit 3	**CRP3**	*Attend to personal health and financial well-being.*
Units 1, 2, 3, 4	**CRP4**	*Communicate clearly and effectively and with reason.*
	CRP5	*Consider the environmental, social and economic impacts of decisions.*

	CRP6	*Demonstrate creativity and innovation.*
	CRP7	*Employ valid and reliable research strategies.*
Units 1, 2, 3, 4	CRP8	*Utilize critical thinking to make sense of problems and persevere in solving them.*
	CRP9	*Model integrity, ethical leadership, and effective management.*
	CRP10	*Plan education and career paths aligned to personal goals.*
Units 1, 2, 3, 4	CRP11	*Use technology to enhance productivity.*
	CRP12	*Work productively in teams while using cultural global competence*

Interdisciplinary Connections
List any other content standards addressed as well as appropriate units

Visual & Performing Arts Integration ([Standard 1](#))
List appropriate units below for which standards (1.1 through 1.4) may be addressed

Unit Addressed	Standard #	Standard Description
Units 1, 2, 3, 4	**Standard 1.1**	**The Creative Process:** *All students will demonstrate an understanding of the elements and principles that govern the creation of works of art in dance, music, theatre, and/or visual art.*
	Standard 1.2	**History of the Arts and Culture:** *All students will understand the role, development, and influence of the arts throughout history and across cultures.*
	Standard 1.3	**Performing/Presenting/Producing:** *All students will synthesize those skills, media, methods, and technologies appropriate to creating, performing, and/or presenting works of art in dance, music, theatre, and/or visual art.*
	Standard 1.4	**Aesthetic Responses & Critique Methodologies:** *All students will demonstrate and apply an understanding of arts philosophies, judgment, and analysis to works of art in dance, music, theatre, and/or visual art.*

Other Interdisciplinary Content Standards

List appropriate units below for any other content/standards that <u>may be addressed</u>

Unit Addressed	Content / Standard #	Standard Description
Units 1, 2, 3, 4	RL.2.1	*Ask and answer questions such as who, what, where, when, why and how to demonstrate understanding of key details in a text.*
Units 1, 2, 3, 4	RL.2.3	*Describe how characters in a story respond to major events and challenges using key details.*
Units 1, 2, 3, 4	RL.2.6	*Acknowledge differences in the points of view of characters, including by speaking in a different voice for each character when reading dialogue aloud.*
Units 1, 2, 3, 4	RL.2.7	*Use information gained from the illustrations and words in a print or digital text to demonstrate understanding of its characters, setting, or plot.*
Units 1, 2, 3, 4	RL.2.10	*Read and comprehend literature, including stories and poetry, at grade level text complexity or above with scaffolding as needed.*
Units 1, 2, 3, 4	RI.2.1	*Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.*
Units 1, 2, 3, 4	RI.2.3	*Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.*
Units 1, 2, 3, 4	RI.2.4	*Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.*
Units 1, 2, 3, 4	RI.2.5	*Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.*
Units 1, 2, 3, 4	RI.2.7	*Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text.*
Units 1, 2, 3, 4	RI.2.10	*Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.*
Units 1, 2, 3, 4	W.2.2	*Write informative/explanatory texts in which they introduce a topic, use evidence-based facts and definitions to develop points, and provide a conclusion.*
Units 1, 2, 3, 4	RI.2.7	*Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text.*
Units 1, 2, 3, 4	SL.2.2	*Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.*
Units 1, 2, 3, 4	SL.2.3	*Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.*
Units 1, 2, 3, 4	SL.2.6	*Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.*
Units 1, 2, 3, 4	L.2.1	*Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.*

Units 1, 2, 3, 4	L.2.2	*Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.*
Units 1, 2, 3, 4	L.2.3	*Use knowledge of language and its conventions when writing, speaking, reading, or listening.*
Unit 3	2-PS1-1	*Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.*
Unit 3	2-PS1-2	*Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.*
Units 1, 3	2-LS2-2	*Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*
Units 1, 3	2-LS4-1	*Make observations of plants and animals to compare the diversity of life in different habitats.*
Unit 1	2-ESS1-1	*Use information from several sources to provide evidence that Earth events can occur quickly or slowly.*
Units 2, 3	2-ESS2-2	*Develop a model to represent the shapes and kinds of land and bodies of water in an area.*
Unit 3	K-2-ETS1-3	*Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.*
Unis 1, 2, 3, 4	6.1.2.CivicsPD.1	*Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.*
Unis 1, 2, 3, 4	6.1.2.CivicsPD.2	*Establish a process for how individuals can effectively work together to make decisions.*
Unit 1	6.1.2.CivicsPR.2	*Cite evidence that explains why rules and laws are necessary at home, in schools, and in communities.*
Unit 3	6.1.2.Geo.SV.4	*Identify examples of geospatial data (e.g., landmarks on the school grounds, the spatial location of each student's assigned seat in the classroom, needs more thought).*
Unit 3	6.1.2.GeoPP.1	*Explain the different physical and human characteristics that might make a location a good place to live (e.g., landforms, climate and weather, resource availability).*
Unit 3	6.1.2.HistoryCC.3	*Make inferences about how past events, individuals, and innovations affect our current lives.*

Unit/ Topic	Month (w/Approx number of Teaching Days)
Operations and Algebraic Thinking Apply Addition and Subtraction Concepts	**September** (~19 days)
Operations and Algebraic Thinking Number Patterns	**October** (~19 days)
Operations and Algebraic Thinking Add 2 digit Numbers	**November** (~16 days)
Operations and Algebraic Thinking Add 2 digit Numbers	**December** (~15 days)
Operations and Algebraic Thinking Subtract Two-Digit Numbers	**January** (~18 days)
Number and Operations in Base 10 Place Value to 1,000	**February** (~18 days)
Number and Operations in Base 10 Add Three-Digit Numbers Subtract Three-Digit Numbers	**March** (~15-20 days)
Measurement and Data Money, Data Analysis, Time	**April** (~15-20 days)
Measurement and Data Customary and Metric Lengths	**May** (~18 days)
Geometry Geometric Shapes and Equal Shares	**June** (~15 days)

Units

Contact the Content Supervisor for unit details.