

COURSE TITLE

Grade 2- Math

LENGTH

Full Year

DEPARTMENT

STEM Department

SCHOOL

Lincoln School
Washington School

DATE

September 10, 2018

Grade 2- Math

I. Introduction/Overview/Philosophy

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.

II. Objectives

Course Outline:

1. Numbers to 1,000
 - a. Counting
 - b. Place Value
 - c. Comparing Numbers
 - d. Order and Pattern
2. Addition to 1,000
 - a. Addition without regrouping and addition with regrouping in Ones and Tens
 - b. Subtraction to 1,000
 - c. Subtraction without and subtraction with regrouping in Ones and Tens
3. Bar Models
 - a. Using part, part, whole
 - b. Adding on and taking away
 - c. Comparing sets
 - d. Two step word problems

4. Multiplication & Division
 - a. Multiplication & Division of 2, 5, 10
 - b. Mult. Tables of 2, 5, 10
5. Measurement
 - a. Metric Measures of Length
 - b. Customary Units of Length
6. Money, Fractions, Time
 - a. Money: identification and comparison
 - b. Fractions: comparison, adding and subtracting
 - c. Time: reading and writing, elapsed time
7. Picture Graphs
8. Lines and Patterns
 - a. Lines and Surfaces
 - b. Shapes and Patterns
9. Mental Math

Student Outcomes:

After successfully completing this course, the student will:

- Add and subtract within 20
- Measure and estimate lengths in standard units
- Reason with shapes and their attributes
- Relate addition and subtraction to length
- Represent and interpret data
- Represent and solve problems involving addition and subtraction
- Understand place value
- Use place value understanding and properties of operations to add and subtract
- Work with equal groups of objects to gain foundations for multiplication
- Work with money
- Work with time

New Jersey Student Learning Standards***CAREER READY PRACTICES******CRP1 Act as a responsible and contributing citizen and employee.***

Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

CRP2 Apply appropriate academic and technical skills.

Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation

CRP4 Communicate clearly and effectively and with reason.

Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CRP6. Demonstrate creativity and innovation.

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

TECHNOLOGY

Standard 8.1 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.

Strand B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.

8.1.2.B.1- Illustrate and communicate original ideas and stories using multiple digital tools and resources.

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.

8.1.2.C.1- Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Strand E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

8.1.2.E.1- Use digital tools and online resources to explore a problem or issue.

Standard 8.2 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 C. Design: The design process is a systematic approach to solving problems.

8.2.2.C.1- Brainstorm ideas on how to solve a problem or build a product.

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.

8.2.2.D.1- Collaborate and apply a design process to solve a simple problem from everyday experiences.

Strand E. Computational Thinking: Programming: Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

8.2.2.E.1- List and demonstrate the steps to an everyday task.

21ST CENTURY LIFE AND CAREERS

9.2 Career Awareness, Exploration, and Preparation

Strand A: Career Awareness

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

NEW JERSEY STUDENT LEARNING STANDARDS- MATH

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. 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.

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.

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.

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.

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.

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.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:

2.NBT.A.1.a. 100 can be thought of as a bundle of ten tens — called a “hundred.”

2.NBT.A.1.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.

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.B.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.

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.

2.OA.B.2. Fluently add and subtract within 20 using mental strategies.

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

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.

III. Proficiency Levels

This curriculum is appropriate for all grade 2 students.

IV. Methods of Assessment

Student Assessment

The teacher will provide a variety of assessments during the course of the year. The assessment may include but is not limited to: chapter and unit tests and quizzes, teacher observations, open-ended problems, cooperative work, and homework.

Curriculum/Teacher Assessment

The teacher will provide the subject area supervisor with suggestions for changes on an ongoing basis.

V. Grouping

This curriculum is appropriate for all students in grade 2.

VI. Articulation/Scope & Sequence/Time Frame

Course length is one year.

VII. Resources***Texts/Supplemental Reading/References***

Math in Focus, Marshall Cavendish, 2015

VIII. Suggested Activities

Appropriate activities are listed in the curriculum map.

IX. Methodologies

The following methods of instruction are suggested: teacher guided explorations, working in groups/working with a partner, working with manipulatives and discovery activities.

X. Interdisciplinary Connections

At this grade level, connections to many other disciplines are appropriate and natural. Reading and writing become an integral part of the mathematics process. Connections with science are frequent throughout both curricula. Technology plays an important part in learning mathematics as well.

XI. Differentiating Instruction for Students with Special Needs: Students with Disabilities, Students at Risk, English Language Learners, and Gifted & Talented Students

Differentiating instruction is a flexible process that includes the planning and design of instruction, how that instruction is delivered, and how student progress is measured. Teachers recognize that students can learn in multiple ways as they celebrate students' prior knowledge. By providing appropriately challenging learning, teachers can maximize success for all students.

Differentiating in this course includes but is not limited to:

Differentiation for Support (ELL, Special Education, Students at Risk)

- Peer mentoring on problems

- Differentiated teacher feedback on assignments
- Modeling out problems on whiteboard
- Visual aids as we project problems on whiteboard
- Study guides
- Tiered assignments
- Scaffolding of materials and assignments
- Re-teaching and review
- Guided note taking
- Exemplars of varied performance levels
- Multi-media approach to accommodating various learning styles

Differentiation for Enrichment

- Supplemental reading material for independent study
- Flexible grouping
- Tiered assignments
- Topic selection by interest
- Enhanced expectations for independent study
- Elevated questioning techniques using Webb's Depth of Knowledge matrix

XII. Professional Development

The teacher will continue to improve expertise through participation in a variety of professional development opportunities.

XII. Curriculum Map/Pacing Guide

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
Numbers to 1,000 <ul style="list-style-type: none"> • Counting • Place Value • Comparing Numbers • Order and Pattern 	3 weeks	<i>For Support:</i> Use touch manipulatives of base-ten blocks and place value mats. Use online virtual manipulatives website. <i>For Enhancement:</i> Incorporate word problems. Order additional numbers.	2.OA.A.1 2.NBT.A.1-4 2.NBT.A.1.A,B CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	<i>Summative:</i> Chapter 1 Assessment <i>Formative:</i> Display numbers in word form, standard form, and expanded form
Addition to 1,000 <ul style="list-style-type: none"> • Addition without regrouping and addition with regrouping in Ones and Tens Subtraction to 1,000 <ul style="list-style-type: none"> • Subtraction without and subtraction with regrouping in Ones and Tens Bar Models <ul style="list-style-type: none"> • Using part, part, whole • Adding on and taking away • Comparing sets • Two step word problems 	12 weeks	<i>For Support:</i> Utilize/teach touch points. Use place value mats. Reduce numbers responsible for. Utilize subtraction poem. Use online virtual manipulatives website. Use 100s chart. <i>For Enhancement:</i> Incorporate word problems. Check work using fact family.	2.OA.B.2 2.NBT.B.5-7 2.OA.A.1 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	<i>Summative:</i> Chapter 2, 3, 4 Assessments <i>Formative:</i> Add and subtract numbers to 1,000 with and without regrouping Solve one step and two step word problems in addition and subtraction using bar model strategy
Multiplication & Division <ul style="list-style-type: none"> • Multiplication & Division 	4 weeks	<i>For Support:</i> Provide hundred chart with highlighted	2.NBT.2 2.OA.C.3,4	<i>Summative:</i> Chapter 5 & 6 Assessment

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
<ul style="list-style-type: none"> of 2, 5, 10 ● Mult. Tables of 2, 5, 10 		numbers. Cube manipulatives for visual groups. <i>For Enhancement:</i> Introduce multiplication of 3s. Incorporate word problems.	CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	<i>Formative:</i> Choral skip counting
Measurement <ul style="list-style-type: none"> ● Metric Measures of Length ● Customary Units of Length 	3 weeks	<i>For Support:</i> Provide colored rulers. Use place value chart. <i>For Enhancement:</i> Incorporate word problems. Compare metric to customary.	2.MD.A.1-4 2.MD.B.5-6 2.MD.D.9 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	<i>Summative:</i> Chapter 7 and 13 Assessments <i>Formative:</i> Measure classroom items
Money, Fractions, Time <ul style="list-style-type: none"> ● Money: identification and comparison ● Fractions: comparison, adding and subtracting ● Time: reading and writing, elapsed time 	12 weeks	<i>For Support:</i> Provide Judy clocks with colored hour hand and minute hand. Time Check charts. <i>For Enhancement:</i> Incorporate word problems. Mixed numbers. Find change from expenses. Elapsed time problems.	2.MD.C.7-8 2.G.A.3 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	<i>Summative:</i> Chapter 11, 12, 14 Assessments <i>Formative:</i> Show money amounts visually Add change Write time multiple ways
Picture Graphs	2 weeks	<i>For Support:</i> Provide hundreds chart for skip counting. Additional number lines for charting data <i>For Enhancement:</i> Incorporate word problems.	2.MD.D.10 2.OA.A.1 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1,	<i>Summative:</i> Chapter 17 Assessment <i>Formative:</i> Create a student based survey and write your own picture graph

Unit Topic	Time Allocated	Differentiating Instruction for Students with Disabilities, Students at Risk, English Language Learners, & Gifted & Talented Students	Standards	Assessments
		Create your own graph.	8.2.2.E.1 9.2.4.A.4	
Lines and Patterns <ul style="list-style-type: none"> ● Lines and Surfaces ● Shapes and Patterns 	2 weeks	<i>For Support:</i> Provide tangrams. Provide 3D solid shapes <i>For Enhancement:</i> Incorporate word problems. Create own individual pattern using specific format	2.G.A.1,2 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	<i>Summative:</i> Chapter 18 and 19 Assessments <i>Formative:</i> Name shapes and characteristics
Mental Math	2 weeks	<i>For Support:</i> Choral skip counting. Ten Buddies. <i>For Enhancement:</i> Incorporate word problems. 3rd Grade tiered problems.	2.NBT.B.8,9 CRP1,2,4,6,7,8,11,12 8.1.2.B.1, 8.1.2.C.1, 8.1.2.E.1 8.2.2.C.1, 8.2.2.D.1, 8.2.2.E.1 9.2.4.A.4	<i>Summative:</i> Chapter 10 Assessment <i>Formative:</i> Fact fluency