Bay Head School	
Content Area: Mathematics **Course Title: Mathematics**	**Grade Level: Second Grade**
Unit Plan 1 Operations and Algebraic Thinking	60 days Ongoing
Unit Plan 2 Number and Operations in Base 10	50 days Ongoing
Unit Plan 3 Measurement and Data	40 days Ongoing
Unit Plan 4 Geometry	30 days Ongoing
Updated: August 2018 by Sharon Carroll	Board Approved:

Standards for Mathematical Practice *The following standards for mathematical practice should be incorporated in all units.*	
MP.1 Make sense of problems and persevere in solving them.	Find meaning in problems Look for entry points Analyze, conjecture and plan solution pathways Monitor and adjust Verify answers Ask themselves the question: "Does this make sense?"

MP.2 Reason abstractly and quantitatively.	Make sense of quantities and their relationships in problems Learn to contextualize and decontextualize Create coherent representations of problems
MP.3 Construct viable arguments and critique the reasoning of others.	Understand and use information to construct arguments Make and explore the truth of conjectures Recognize and use counterexamples Justify conclusions and respond to arguments of others
MP 4 Model with mathematics.	Apply mathematics to problems in everyday life Make assumptions and approximations Identify quantities in a practical situation Interpret results in the context of the situation and reflect on whether results make sense
MP.5 Use appropriate tools strategically	Consider the available tools when solving problems Are familiar with tools appropriate for their grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a website and other technological tools) Make sound decisions of which of these tools might be helpful
MP.6 Attend to precision.	Communicate precisely to others Use clear definitions, state the meaning of symbols and are careful specifying units of measure and labeling axes Calculate accurately and efficiently
MP.7 Look for and make use of structure	Discern patterns and structures Can step back for an overview and shift perspective See complicated things as single objects or as being composed of several objects
MP.8 Look for and express regularity in repeated reasoning.	Notice if calculations are repeated and look for both general methods and shortcuts. In solving problems, maintain oversight of the process while attending to detail Evaluate the reasonableness of their immediate results

Content Area: Mathematics   **Grade Level:** Second Grade

Domain (Unit Title): Operations and Algebraic Thinking

Cluster: 2.OA

Cluster Summary:
- Represent and solve problems involving addition and subtraction
- Add and subtract within 20
- Work with equal groups of objects to gain foundations for multiplication

Primary Interdisciplinary Connections:

Science	experiments, manipulate data
Social Studies	Timelines, dates
Language Arts	open ended questions, math literacy stories related to math concepts
Technology	interactive games/websites and interactive Smartboards

21st Century Themes:

Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Financial Literacy	Students will use addition and subtract to make appropriate financial choices.
Communication and Collaboration	Students will use mathematical arguments to articulate thoughts and ideas with peers and teachers.

College and Career Readiness

Mathematics programs develops a deep understanding of mathematics by building a strong foundation of number sense at the elementary level before moving into more advanced content. Students will learn to make sense of problems and persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

Learning Targets

Content Standards:

Number	Standard for Mastery
2.OA.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.2	Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.
2.OA.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.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	**Standard for Introduction**
3.OA.1	Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7.
3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

Unit Essential Questions	**Unit Enduring Understandings**
- How is an equation like a balance scale? - How can change be best represented mathematically? - How do operations affect numbers?	*Students will understand that…* - mathematical expressions represent relationships. - the symbolic language of algebra is used to communicate and generalize the patterns in mathematics. - the magnitude of numbers affects the outcome of operations on them
Unit Objectives *Students will know…* - representing and solving problems involves addition and subtraction. - addition and subtraction within 20. - foundations for multiplication by workers with equal groups of objects	**Unit Objectives** *Students will be able to…* - use addition to find the total number of objects such as total number of animals in a zoo and total number of students in first and second grade. Subtraction is used to solve problems such as how many objects are left in a set after taking some away, or how much longer one line is than another. - know from memory all sums of two one-digit numbers. - use arrays or pictures to represent multiplication concepts.

Content Area: Mathematics   **Grade Level:** Second Grade

Domain (Unit Title): Number in Operations in Base 10

Cluster: 2.NBT

Cluster Summary:
- Understand place value
- Use place value understanding and properties of operations to add and subtract

Primary Interdisciplinary Connections:

Science	Science experiments, manipulate data
Social Studies	Timelines, reading and interpreting graphs
Language Arts	open ended questions, math literacy stories, math centers
Technology	interactive games/websites and interactive Smartboards

21st Century Themes:

Global Awareness	Students work with word problems containing names of people and locations around the world.
Communication and Collaboration	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers
Critical Thinking and Problem Solving	Students use various types of reasoning as appropriate to solve a mathematical problem.

College and Career Readiness

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content. Students will learn to make sense of problems and persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

Learning Targets

Content Standards:

Number	Standard for Mastery
2.NBT.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: ○ 100 can be thought of as a bundle of ten tens – called a "hundred." ○ 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.2	Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.3	Read and write numbers to 1000 using base-ten numerals, number names and expanded form.
2.NBT.4	Compare two three-digits numbers based on meaning of the hundreds, tens and ones digits using the >, <, = symbols to record the results of comparisons.
2.NBT.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.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.NBT.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.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.9	Explain why addition and subtraction strategies work, using place value and the properties of operations.["Explanations may be supported by drawings or objects."]
Number	**Standard for Introduction**
3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 using strategies based on place value and properties of operations.

Unit Essential Questions

- How does the position of a digit in a number affect its value?
- What are efficient ways to count?
- What are efficient methods for finding sums and differences?
- How can we compare and contrast numbers?

Unit Enduring Understandings
Students will understand that…

- place value is based on groups of ten.
- computation involves taking apart and combining numbers using a variety of approaches.
- flexible methods of computation involve grouping numbers in strategic ways.
- two three-digits numbers can be compared based on the meaning of the hundreds, tens and ones digits using the >,
- <, = symbols to record the results of comparisons.

Unit Objectives
Students will know…

- place value and properties of operations to add and subtract.

Unit Objectives
Students will be able to…

- read, write, and compare three digit numbers.
- fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship

	between addition and subtraction. ● mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900. ● explain why addition and subtraction strategies work, using place value and the properties of operations.

Bay Head School
MATHEMATICS CURRICULUM
Unit Overview

Content Area: Mathematics	**Grade Level:** Second Grade

Domain (Unit Title): Measurement and Data

Cluster: 2.MD

Cluster Summary:
- Measure and estimate lengths in standard units
- Relate addition and subtraction to length
- Work with time and money
- Represent and interpret data

  Primary Interdisciplinary Connections:

Science	science experiments, manipulate data, sizes of the planets, measuring plant growth, develop knowledge of temperature and weather patterns in terms of fractions
Social Studies	map skills, geography, scale models
Language Arts	open ended questions, relevant read alouds related to math are used to introduce and reinforce math concepts
Technology	interactive games/websites and interactive Smartboards

21st Century Themes:

Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Communication and Collaboration	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers
Civic Literacy	Students understand the skills of mapping, gridding, compass directions, and cardinal directions

College and Career Readiness

Mathematics programs develops a deep understanding of mathematics by building a strong foundation of number   sense at the elementary level before moving into more advanced content. Students will learn to make sense of problems and persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

Learning Targets

Content Standards:

Number	Standard for Mastery
2.MD.1	Measure the length of an object by selecting and using appropriate tools

	such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.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.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.MD.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.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.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.7	Tell and write time from analog and digital clocks to the nearest five minutes using am and pm.
2.MD.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?
2.MD.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.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.
Number	**Standard for Introduction**
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).[1] Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as

	a beaker with a measurement scale) to represent the problem.
3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement.
	  a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
	  b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

3.MD.7	Relate area to the operations of multiplication and addition.
	  a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
	  b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
	  c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.
	  d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

Unit Essential Questions

- What is the purpose of measurement?
- What are different things we can measure?
- How do we decide which tool to use to measure something?
- What are the ways in which data can be displayed?
- What can data tell you about the people you survey?
- What is the purpose of estimating and when is it appropriate?
- What types of problems are solved with measurement?
- How can information be gathered, recorded, and organized?

Unit Enduring Understandings
Students will understand that…

- measurement is used to understand and describe the world including sports, construction, and explaining the environment.
- objects have distinct attributes that can be measured.
- standard units provide common language for communication of measurements.
- the choice of measurement tools depends on the measureable attribute and the degree of precision desired.
- graphs convey data in a concise way.
- people use data to describe the world and answer questions such as how many classmates are buying lunch today, how much it rained yesterday, or in which month are the most birthdays.

Unit Objectives
Students will know…

- lengths can be measured and estimated .
- addition and subtraction relate to length and measurement.
- money has value and can be expressed using $ and ¢.
- the difference between analog and digital clocks, a.m. and p.m., and understand time increments.
- data can be represented and interpreted.

Unit Objectives
Students will be able to…

- measure a common object using the appropriate tool such as ruler to measure a book, etc.
- measure a common object using two different units of measurement such as measuring a desk using both inches and feet, etc.
- estimate the length of common objects such as a desk, a book, a chalkboard, etc., using inches, feet, centimeters, and meters.
- measure two objects and express the difference in their lengths.
- 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.
	● create a number line correctly placing whole numbers starting with 0, and use the number line to express sums and differences of whole numbers.
	● tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram
	● 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?
	● display the results of measuring objects to the nearest whole number by making a line plot.
	● draw a picture graph and bar graph to represent data.

Content Area: Mathematics   **Grade Level:** Second Grade

Domain (Unit Title): Geometry

Cluster: 2.G

Cluster Summary:
- Reason with shapes and their attributes

Primary Interdisciplinary Connections:

Science	shapes of the planets, experiments, symmetry in nature, timeline of moon phases
Social Studies	geography- state and continents, map skills
Language Arts	open ended questions, math literacy stories, shape journal entry
Technology	interactive games/websites, explore and expand visual patterns using the computer, and interactive Smartboard

21st Century Themes:

Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Communication	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers
Civic Literacy	Students understand the skills of mapping, gridding, and compass directions

College and Career Readiness

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content. Students will learn to make sense of problems and persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

Learning Targets

Content Standards:

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

Number	Standard for Introduction
3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

Unit Essential Questions	Unit Enduring Understandings
- How can spatial relationships be described by careful use of geometric language? - How can area, perimeter and fractional parts be determined	*Students will understand that…* - geometric properties can be used to construct geometric figures. - geometric relationships provide a means to make sense of a variety of phenomena.

through the use of rows and columns? ● How do fractions help you share equally?	● use fractions to name parts of groups and find fractional parts of groups

Unit Objectives *Students will know…* ● a given number of angles or a given number of faces on a specified shape ● shapes are classified ● equal shares of identical wholes need not have the same shape	**Unit Objectives** *Students will be able to…* ● analyze shapes by examining their sides and angles ● decompose and combine shapes to make other shapes ● build, draw and analyze two- and three-dimensional shapes

Evidence of Learning

Suggested Formative Assessments:
- Teacher Observation
- Performance Assessment
- Exit Slips/Slate Assessment
- Portfolios/Journals
- Pre-Assessment

· Games
· Anecdotal Records
· Oral Assessment/Conferencing
· Daily Classwork

Suggested Summative Assessments:
- Tests
- Quizzes
- National/State/District Assessments

Suggested Modifications (ELLs, Special Education, Gifted and Talented):

Low Level Strategies:
- Modified classroom and homework assignments
- Teacher tutoring
- Parent - teacher communication
- Anchor charts and visual aids
- Flexible grouping
- Teacher - student goal setting
- Technology integration
- Centers

● Response to intervention

High Level Strategies
- Multi-step and higher level math problems
- Enrich problems
- Extend activities
- Centers
- Student driven activities
- Student choice activities
- Peer tutoring

Suggested activities for lesson plans:

Shape Properties Math Cards	Match cards with shapes: names, properties, three-sided, four-sided, shapes with equal sides, and parallel lines.
Shape Hunt	Can you find these shapes outdoor? Name the shape and write where you found it.
Shape Taboo Game	27 cards featuring shape related words. the game is for two players, a "reader" and a "guesser". The object of the game is for the "reader" to help his/her partner to identify the correct vocabulary word on the card by describing the word as clearly as possible without using any of the "Taboo" words. Shape Taboo Cards

Teacher Notes: