



# **GRADE 2 MATHEMATICS**

CURRICULUM

CARLISLE AREA SCHOOL DISTRICT

DATE OF BOARD APPROVAL: AUGUST 18, 2022

## COURSE OVERVIEW

<b>Title:</b>	Grade 2 Mathematics
<b>Grade Level:</b>	2
<b>Level:</b>	N/A
<b>Length:</b>	90 Minute Blocks
<b>Duration:</b>	165-180 Days
<b>Frequency:</b>	Daily
<b>Pre-Requisites:</b>	N/A
<b>Credit:</b>	N/A
<b>Description:</b>	<p>This curriculum document is part of a vertically-aligned sequence of curricula from grades Kindergarten through five. Each grade level is aligned to the Pennsylvania Mathematics Standards, and addresses the four curricular domains: Numbers and Operations, Algebraic Thinking, Geometry, and Measurement and Data. Throughout elementary school, these courses are designed to develop students' concrete and abstract understanding of mathematics, foster strong number sense, and strengthen the ability to solve increasingly complex problems using a variety of methods and strategies. Ultimately, the objective is to empower students as mathematical thinkers and communicators.</p> <p><i>*Throughout document, italicized vocabulary appears in PSSA Mathematics Glossary.</i></p>

## COURSE TIMELINE

UNIT	TITLE	KEY CONCEPTS	DURATION (DAYS)
	Number Sense and Fact Fluency	<ul style="list-style-type: none"> <li>Ongoing skill development</li> </ul>	Ongoing
1	Numbers and Operations – Foundations	<ul style="list-style-type: none"> <li>Counting and skip counting in sequence</li> <li>Adding and subtracting to 20</li> </ul>	15 Days
2	Numbers and Operations in Base 10	<ul style="list-style-type: none"> <li>Place value up to four-digit numbers</li> <li>Comparing numbers up to three-digits</li> </ul>	25 Days
3	Operations and Algebraic Thinking	<ul style="list-style-type: none"> <li>Adding and subtracting up to 100</li> <li>Adding and subtracting up to 1,000</li> <li>Solving problems involving addition and subtraction</li> </ul>	55 Days
4	Measurement	<ul style="list-style-type: none"> <li>Telling time to nearest hour and half hour</li> <li>Counting and understanding money</li> <li>Measuring in U.S. standard units</li> </ul>	30 Days
5	Data	<ul style="list-style-type: none"> <li>Reading and interpreting a variety of graphs</li> <li>Presenting data as charts and graphs</li> </ul>	15 Days
6	Geometry	<ul style="list-style-type: none"> <li>Classifying objects by specific attributes</li> <li>Concept of fractions (parts of whole)</li> <li>Understanding 2- and 3-dimensional shapes</li> </ul>	15 Days
7	Operations and Algebraic Concepts – Multiplication and Division	<ul style="list-style-type: none"> <li>Using arrays to represent repeated addition</li> <li>Introduction to multiplication and division</li> </ul>	10 Days

## DISCIPLINARY SKILLS and PRACTICES

DISCIPLINARY SKILL/PRACTICE	DESCRIPTION
Make sense of problems and persevere in solving them	Make conjectures about how real world application problems may be solved, monitor progress toward a solution, and make adjustments in the problem solving plan if necessary.
Reason abstractly and quantitatively	Estimate and check answers to problems and determine the reasonableness of results.
Construct viable arguments and critique the reasoning of others	Justify and communicate conclusions effectively and respond to arguments logically.
Model with mathematics	Use mathematics to model real world problems, interpreting the mathematical results in the context of the situation.
Use appropriate tools strategically	Consider the tools available in solving problems and understand the insights gained by using the tool as well as the limitation of the tool.
Attend to precision	Calculate accurately and efficiently within the context of problems and communicate results precisely.
Look for and make use of structure	Examine problems to discern a pattern or structure and utilize this finding in similar problems.
Look for and express regularity in repeated reasoning	Notice repeated calculations or processes and generalize from those insights in order to solve problems.

*\*Adapted from PA Academic Standards for Mathematics.*

## FLUENCY UNIT

<b>Unit Title</b>	Number Sense and Math Fluency ( <b>Ongoing</b> )		
<b>Unit Description</b>	This is an ongoing mathematics fluency unit that is designed to be taught and reviewed consistently throughout the school year.		
<b>Unit Assessment</b>	N/A		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
Fluency Skills	<input type="checkbox"/> Master addition (0-10). <input type="checkbox"/> Master addition (10-20). <input type="checkbox"/> Master subtraction (0-10). <input type="checkbox"/> Master subtraction (10-20). <input type="checkbox"/> Represent numbers in various ways. <input type="checkbox"/> Read and write one-digit numbers. <input type="checkbox"/> Read and write two-digit numbers. <input type="checkbox"/> Read and write numbers larger than two digits.	<b>Vocabulary</b> fact fluency, digits, ones, tens, hundreds, thousands place	CC.2.2.2.A.2 Use mental strategies to add and subtract within 20.  CC.2.1.2.B.2 Use place-value concepts to read, write, and skip count to 1000.  CC.2.1.2.B.3 Use place-value understanding and properties of operations to add and subtract within 1,000.

## Unit 1

<b>Unit Title</b>	Numbers and Operations – Foundations (15 Days)		
<b>Unit Description</b>	Students will develop number sense, and addition and subtraction skills. Students will build number sense by counting objects, writing numbers in order, and comparing numbers to 20, and will use these skills and multiple strategies to add and subtract to 20. Students will then transfer these skills to solve word problems. This unit precedes all other units because it lays the foundation for second grade math skills.		
<b>Unit Assessment</b>	Common Assessment		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
How do I count on and skip count by 1s, 2s, 3s, 5s, and 10s to 100?	<input type="checkbox"/> Count up on a number line. <input type="checkbox"/> Skip count by 2s and 3s. <input type="checkbox"/> Skip count by 5s and 10s. <input type="checkbox"/> Identify and explain patterns when counting by 2s, 3s, 5s and 10s (odd and even). <input type="checkbox"/> Determining if a number is odd or even.	<b>Vocabulary</b> number line, skip count, patterns, odd and even, hundreds grid	CC.2.1.1.B.2 Use place concepts to represent amounts of tens and ones and to compare two-digit numbers. (First grade standard)
How do I find sums to 20?	<input type="checkbox"/> Use various strategies to solve addition problems up to 20.	<b>Vocabulary</b> strategy, sum/addition, number grid, number line, manipulatives  <b>Example Strategies</b> +0 and +1 strategy, doubles, doubles +1, combinations of 10, turnaround	CC.2.2.2.A.2 Use mental strategies to add and subtract within 20.

<p>How do I find differences to 20?</p>	<p><input type="checkbox"/> Use various strategies to solve subtraction problems up to 20.</p>	<p><b>Vocabulary</b>  difference/subtract, strategy, number grid, number line, manipulatives, turn around rule</p> <p><b>Example Strategies</b>  0 and -1 strategy, count up and back, think addition</p>	<p>CC.2.2.2.A.2  Use mental strategies to add and subtract within 20.</p>
---	--	---	---

## UNIT 2

<b>Unit Title</b>	Numbers and Operations in Base 10 (25 Days)		
<b>Unit Description</b>	Students will learn place value with whole numbers. They will be able to read and represent whole numbers, identify place value, round whole numbers, as well as add and subtract multi-digit numbers. This unit provides a foundation for number sense and place value that students will need to understand mathematical operations and problem-solving skills.		
<b>Unit Assessment</b>	Common Assessment		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
How do I identify place value up to four-digit numbers?	<input type="checkbox"/> Identify ones, tens, hundreds, and thousands place. <input type="checkbox"/> Read and write numbers using place value. <input type="checkbox"/> Represent numbers using base 10 blocks through the thousands. <input type="checkbox"/> Skip count by 2s, 3s, 5s, and 10s to 1,000.	<b>Vocabulary</b> value, base 10, standard form, expanded form, word form	CC.2.1.2.B.1 Use place-value concepts to represent amounts of tens and ones and to compare three-digit numbers.  CC.2.1.2.B.2 Use place-value concepts to read, write, and skip count to 1,000.
How do I compare two whole numbers up to three digits?	<input type="checkbox"/> Compare two numbers up to three digits. <input type="checkbox"/> Explain how to compare two numbers up to three digits.	<b>Vocabulary</b> compare, greater than, less than, equal to	CC.2.1.2.B.3 Use place-value understanding and properties of operations to add and subtract within 1,000.



## UNIT 3

<b>Unit Title</b>	Operations and Algebraic Thinking <b>(55 Days)</b>		
<b>Unit Description</b>	Students will learn how to use place value to solve multi-digit addition and subtraction problems. They will use rounding to estimate the sums and differences of equations. They will use a variety of strategies to master multi-digit addition and subtraction with and without regrouping. Emphasis will be placed on traditional algorithms. Students will also analyze and solve word problems to practice adding and subtracting multi-digit numbers.		
<b>Unit Assessment</b>	Common Assessment		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
How do I round whole numbers to a given place?	<input type="checkbox"/> Round whole numbers to the hundreds place. <input type="checkbox"/> Explain when rounding is a useful strategy.	<b>Vocabulary</b> rounding, estimate	N/A
How do I add within 100?	<input type="checkbox"/> Solve addition problems within 100. <input type="checkbox"/> Solve addition word problems within 100.	<b>Example Strategies</b> partial sums, traditional addition algorithm, find combinations, base 10 blocks, rounding	CC.2.2.2.A.1 Represent and solve problems involving addition and subtraction within 100.  CC.2.2.2.A.2 Use mental strategies to add and subtract within 20.

How do I subtract within 100?	<input type="checkbox"/> Solve subtraction problems within 100. <input type="checkbox"/> Solve subtraction word problems within 100.	<b>Vocabulary</b> regrouping, traditional subtraction algorithm  <b>Example Strategies</b> traditional subtraction algorithm, rounding	CC.2.2.2.A.1 Represent and solve problems involving addition and subtraction within 100.  CC.2.2.2.A.2 Use mental strategies to add and subtract within 20.
How do I add and subtract within 1,000?	<input type="checkbox"/> Solve addition problems to 1,000. <input type="checkbox"/> Solve subtraction problems to 1,000. <input type="checkbox"/> Solve addition and subtraction word problems to 1,000.	<b>Example Strategies</b> traditional algorithm, turn-around rule, making a ten, doubles and doubles +1	CC.2.1.2.B.3 Use place value understanding and properties of operations to add and subtract within 1,000.
How do I answer open ended questions involving addition and subtraction to 1,000?	<input type="checkbox"/> Teach the steps to answer open ended multi-step questions involving addition and subtraction to 1,000.	N/A	N/A

## UNIT 4

<b>Unit Title</b>	Measurement (30 Days)		
<b>Unit Description</b>	Students will learn measurement involving time, money, and length. They will be able to solve real-world problems based on time, money, and length incorporating all previously taught numbers and operations concepts.		
<b>Unit Assessment</b>	Common Assessment		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
How do I tell time to the nearest five minutes on analog and digital clocks?	<input type="checkbox"/> Tell, show, and write time to the nearest hour and half hour. <input type="checkbox"/> Tell, show, and write time to the nearest quarter hour and nearest five minutes. <input type="checkbox"/> Distinguish between AM and PM time and activities.	<b>Vocabulary</b> hour hand, minute hand, half hour, quarter hour, AM and PM, analog clock, digital clock	CC.2.4.2.A.2 Tell and write time to the nearest five minutes using both analog and digital clocks.
How do I count money?	<input type="checkbox"/> Identify and count groups of pennies, nickels, and dimes. <input type="checkbox"/> Identify and count quarters and paper money. <input type="checkbox"/> Identify and count a mixed variety of coins and paper money. <input type="checkbox"/> Identify equivalent monetary values using different groups of coins (example: 5 pennies can be exchanged for a nickel).	<b>Vocabulary</b> penny, nickel, dime, quarter, one-, five-, and ten-dollar bills	CC.2.4.2.A.3 Solve problems and make change using coins and paper currency with appropriate symbols.

<p>How do I solve problems and make change using coins and paper money?</p>	<input type="checkbox"/> Make change involving coins and dollars. <input type="checkbox"/> Solve word problems involving making change.	<p><b>Vocabulary</b>  penny, nickel, dime, quarter, one-, five-, and ten-dollar bills, exchange, change</p>	<p>CC.2.4.2.A.3  Solve problems and make change using coins and paper currency with appropriate symbols.</p>
<p>How do I measure in US standard units?</p>	<input type="checkbox"/> Measure the length of an object using inches, feet, and yards. <input type="checkbox"/> Choose the appropriate tool (ruler or yardstick) to measure objects of different lengths. <input type="checkbox"/> Measure to determine how much longer one object is than another and express the length in terms of standard units.	<p><b>Vocabulary</b>  feet, inch, ruler, yardstick, estimate, standard unit</p>	<p>CC.2.4.2.A.1  Measure and estimate lengths in standard units using appropriate tools.</p> <p>CC.2.4.2.A.6  Extend the concepts of addition and subtraction to problems involving length.</p>
<p>How do I answer open ended questions involving time, money, and length?</p>	<input type="checkbox"/> Teach the steps to answer open ended questions involving time, money, and length.	<p>N/A</p>	<p>N/A</p>

## UNIT 5

<b>Unit Title</b>	Data (15 Days)		
<b>Unit Description</b>	Student will learn to represent and interpret data on line plots, picture graphs, and bar graphs.		
<b>Unit Assessment</b>	Common Assessment		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
How do I read and interpret data on a variety of graphs?	<input type="checkbox"/> Read and interpret a graph. <input type="checkbox"/> Ask and answer questions related to a variety of graphs.	<b>Vocabulary</b> graphs, bar graph, line plot, picture graphs, data	CC.2.4.2.A.4 Represent and interpret data using line plots, picture graphs, and bar graphs.
How do I create a variety of graphs using given data?	<input type="checkbox"/> Create a graph using given data. <input type="checkbox"/> Ask and answer questions related to the created graphs.	<b>Vocabulary</b> data	CC.2.4.2.A.4 Represent and interpret data using line plots, picture graphs, and bar graphs.
How do I answer an open ended question interpreting data on a line plot, bar graph, and picture graphs?	Teach the steps to answer open ended questions involving interpreting data on a line plot, bar graph, and picture graph?	N/A	N/A

## UNIT 6

<b>Unit Title</b>	Geometry (15 Days)		
<b>Unit Description</b>	Students will learn about two- and three-dimensional shapes and their attributes. They will identify a variety of quadrilaterals. Students will describe and compare shapes using their attributes, and partition shapes into equal parts to build knowledge of equal sharing and the basis of fractions. Students will read and write fractions in halves, thirds, and fourths.		
<b>Unit Assessment</b>	Common Assessment		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
How do I identify a two-dimensional shape based on its attributes?	<input type="checkbox"/> Identify and draw polygons based on specific attributes. <input type="checkbox"/> Categorize shapes based on attributes.	<b>Vocabulary</b> triangles, quadrilaterals (rectangle, square, rhombus/kite, trapezoid, parallelogram), pentagons, hexagons, attributes (sides, angles, vertices, right angle)	CC.2.3.2.A.1 Analyze and draw two- and three-dimensional shapes having specified attributes.
How do I partition a two-dimensional shape into halves, thirds, and quarters?	<input type="checkbox"/> Partition rectangles, circles, and squares into two, three, or four equal parts. <input type="checkbox"/> Describe the parts of the whole using fraction vocabulary.	<b>Vocabulary</b> partition, rows, columns, halves, thirds, fourths, fraction, equal shares,	CC.2.3.2.A.2 Use the understanding of fractions to partition shapes into halves, quarters, and thirds.
How do I identify a three-dimensional shape based on its attributes?	<input type="checkbox"/> Identify three-dimensional shapes based on specific attributes. <input type="checkbox"/> Categorize attributes of shapes.	<b>Vocabulary</b> solid shape, three-dimensional shapes, cube, rectangular prism, sphere, cone, cylinder, pyramid, attributes (face, edge, apex, vertices)	CC.2.3.2.A.1 Analyze and draw two- and three-dimensional shapes having specified attributes.

How do I answer open ended questions categorizing attributes of two- and three-dimensional shapes?	<input type="checkbox"/> Teach the steps to answer open ended questions categorizing attributes of shapes.	N/A	N/A
--	--	-----	-----

## UNIT 7

<b>Unit Title</b>	Operations and Algebraic Concepts - Multiplication and Division <b>(10 Days)</b>		
<b>Unit Description</b>	Students will work with equal groups of objects to gain foundations for multiplication.		
<b>Unit Assessment</b>	Common Assessment		
<b>Essential Question</b>	<b>Learning Goals</b>	<b>Content and Vocabulary</b>	<b>Standards</b>
How do I create arrays to show repeated addition?	<input type="checkbox"/> Represent and solve problems involving real-world examples of repeated addition. <input type="checkbox"/> Use manipulatives to create arrays to show repeated addition and multiplication.	<b>Vocabulary</b> array, multiplication, repeated addition	CC.2.2.2.A.3 Work with equal groups of objects to gain foundations for multiplication.
How do I represent and solve problems using equal groups?	<input type="checkbox"/> Solve problems involving equal division (sharing).	<b>Vocabulary</b> division (sharing)	CC.2.2.2.A.3 Work with equal groups of objects to gain foundations for multiplication.



# ACCOMMODATIONS AND MODIFICATIONS

Adaptations or modifications to this planned course will allow exceptional students to earn credits toward graduation or develop skills necessary to make a transition from the school environment to community life and employment. The I.E.P. team has determined that modifications to this planned course will meet the student's I.E.P. needs.

Adaptations/Modifications may include but are not limited to:

## **INSTRUCTION CONTENT**

- Modification of instructional content and/or instructional approaches
- Modification or deletion of some of the essential elements

## **SETTING**

- Preferential seating

## **METHODS**

- Additional clarification of content
- Occasional need for one to one instruction
- Minor adjustments or pacing according to the student's rate of mastery
- Written work is difficult, use verbal/oral approaches
- Modifications of assignments/testing
- Reasonable extensions of time for task/project completion
- Assignment sheet/notebook
- Modified/adjusted mastery rates
- Modified/adjusted grading criteria
- Retesting opportunities

## **MATERIALS**

- Supplemental texts and materials
- Large print materials for visually impaired students
- Outlines and/or study sheets
- Carbonless notebook paper
- Manipulative learning materials
- Alternatives to writing (tape recorder/calculator)