

North East School District PA Core Curriculum Map

Math

First Grade



INTRODUCTION

North East School District has adopted Pennsylvania Department of Education's Standards for Mathematical Practice that highlight the effective use of understanding, knowledge, and skills in order to prepare students to be college and or career ready.

In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes (CCSS, 2013).

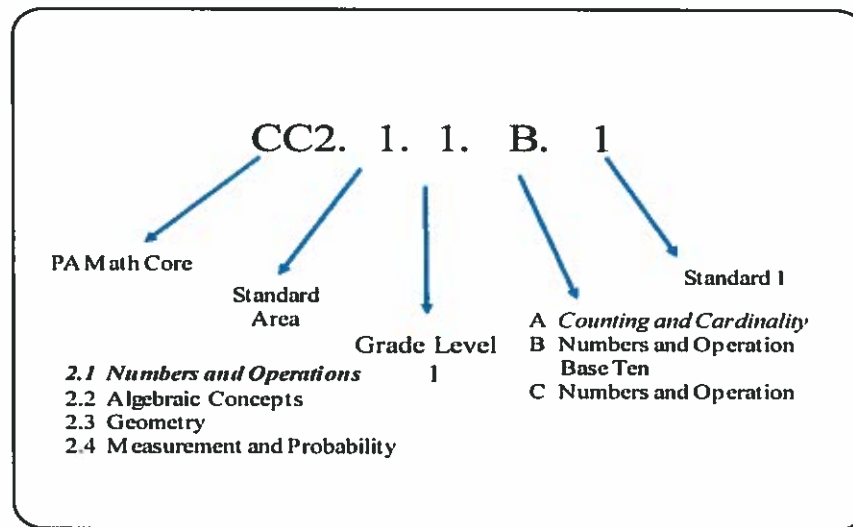
Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., "making tens") to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.

Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.

Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement.¹

Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

Mathematical Standards: Development and Progression												
	Pre K	K	1	2	3	4	5	6	7	8	HS	
2.1 Numbers and Operations	(A) Counting & Cardinality											
		(B) Number and Operations in Base Ten						(D) Ratios and Proportional Relationships			(F) Number and Quantity	
					(C) Number and Operations - Fractions			(E) The Number System				
2.2 Algebraic Concepts	(A) Operations and Algebraic Thinking							(B) Expressions and Equations		(D) Algebra		
										(C) Functions		
2.3 Geometry	(A) Geometry											
2.4 Measurement, Data and Probability	(A) Measurement and Data							(B) Statistics and Probability				




Standards for Mathematical Practice in First Grade

Below are a few examples of how the Standards for Mathematical Practices may be integrated into tasks that students complete:

<p>1. Make Sense and Persevere in Solving Problems.</p>	<p>Mathematically proficient students in First Grade continue to develop the ability to focus attention, test hypotheses, take reasonable risks, remain flexible, try alternatives, exhibit self-regulation, and persevere (Copley, 2010). As the teacher uses thoughtful questioning and provides opportunities for students to share thinking, First Grade students become conscious of what they know and how they solve problems. They make sense of task-type problems, find an entry point or a way to begin the task, and are willing to try other approaches when solving the task. They ask themselves, “Does this make sense?” First Grade students’ conceptual understanding builds from their experiences in Kindergarten as they continue to rely on concrete manipulatives and pictorial representations to solve a problem, eventually becoming fluent and flexible with mental math as a result of these experiences.</p>
<p>2. Reason abstractly and quantitatively.</p>	<p>Mathematically proficient students in First Grade recognize that a number represents a specific quantity. They use numbers and symbols to represent a problem, explain thinking, and justify a response. For example, when solving the problem: “<i>There are 60 children on the playground. Some children line up. There are 20 children still on the playground. How many children lined up?</i>” first grade students may write $20 + 40 = 60$ to indicate a Think-Addition strategy. Other students may illustrate a counting-on by tens strategy by writing $20 + 10 + 10 + 10 + 10 = 60$. The numbers and equations written illustrate the students’ thinking and the strategies used, rather than how to simply compute, and how the story is decontextualized as it is represented abstractly with symbols.</p>
<p>3. Construct viable arguments and critique the reasoning of others.</p>	<p>Mathematically proficient students in First Grade continue to develop their ability to clearly express, explain, organize and consolidate their math thinking using both verbal and written representations. Their understanding of grade appropriate vocabulary helps them to construct viable arguments about mathematics. For example, when justifying why a particular shape isn’t a square, a first grade student may hold up a picture of a rectangle, pointing to the various parts, and reason, “It can’t be a square because, even though it has 4 sides and 4 angles, the sides aren’t all the same size.” In a classroom where risk-taking and varying perspectives are encouraged, mathematically proficient students are willing and eager to share their ideas with others, consider other ideas proposed by classmates, and question ideas that don’t seem to make sense.</p>
<p>4. Model with mathematics.</p>	<p>Mathematically proficient students in First Grade model real-life mathematical situations with a number sentence or an equation, and check to make sure that their equation accurately matches the problem context. They also use tools, such as tables, to help collect information, analyze results, make conclusions, and review their conclusions to see if the results make sense and revising as needed.</p>

<p>5. Use appropriate tools strategically.</p>	<p>Mathematically proficient students in First Grade have access to a variety of concrete (e.g. 3-dimensional solids, ten frames, number balances, number lines) and technological tools (e.g., virtual manipulatives, calculators, interactive websites) and use them to investigate mathematical concepts. They select tools that help them solve and/or illustrate solutions to a problem. They recognize that multiple tools can be used for the same problem- depending on the strategy used. For example, a child who is in the counting stage may choose connecting cubes to solve a problem. While, a student who understands parts of number, may solve the same problem using ten-frames to decompose numbers rather than using individual connecting cubes. As the teacher provides numerous opportunities for students to use educational materials, first grade students' conceptual understanding and higher-order thinking skills are developed.</p>
<p>6. Attend to precision.</p>	<p>Mathematically proficient students in First Grade attend to precision in their communication, calculations, and measurements. They are able to describe their actions and strategies clearly, using grade-level appropriate vocabulary accurately. Their explanations and reasoning regarding their process of finding a solution becomes more precise. In varying types of mathematical tasks, first grade students pay attention to details as they work. For example, as students' ability to attend to position and direction develops, they begin to notice reversals of numerals and self-correct when appropriate. When measuring an object, students check to make sure that there are not any gaps or overlaps as they carefully place each unit end to end to measure the object (iterating length units). Mathematically proficient first grade students understand the symbols they use ($=$, $>$, $<$) and use clear explanations in discussions with others. For example, for the sentence $4 > 3$, a proficient student who is able to attend to precision states, "Four is more than 3" rather than "The alligator eats the four. It's bigger."</p>
<p>7. Look for and make use of structure.</p>	<p>Mathematically proficient students in First Grade carefully look for patterns and structures in the number system and other areas of mathematics. For example, while solving addition problems using a number balance, students recognize that regardless whether you put the 7 on a peg first and then the 4, or the 4 on first and then the 7, they both equal 11 (commutative property). When decomposing two-digit numbers, students realize that the number of tens they have constructed 'happens' to coincide with the digit in the tens place. When exploring geometric properties, first graders recognize that certain attributes are critical (number of sides, angles), while other properties are not (size, color, orientation).</p>
<p>8. Look for and express regularity in repeated reasoning.</p>	<p>Mathematically proficient students in First Grade begin to look for regularity in problem structures when solving mathematical tasks. For example, when adding three one-digit numbers and by making tens or using doubles, students engage in future tasks looking for opportunities to employ those same strategies. Thus, when solving $8+7+2$, a student may say, "I know that 8 and 2 equal 10 and then I add 7 more. That makes 17. It helps to see if I can make a 10 out of 2 numbers when I start." Further, students use repeated reasoning while solving a task with multiple correct answers. For example, in the task "There are 12 crayons in the box. Some are red and some are blue. How many of each could there be?" First Grade students realize that the 12 crayons could include 6 of each color ($6+6 = 12$), 7 of one color and 5 of another ($7+5 = 12$), etc. In essence, students repeatedly find numbers that add up to 12.</p>

<p><u>SUBJECT</u></p> 	<p><u>MATHEMATICS</u></p>			<p><u>GRADE</u> <u>1ST</u></p>
<p><u>COURSE DESCRIPTION-</u> In grade 1, instructional time should focus on four critical areas (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths consistently; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.</p>				
<p>UNIT #/TIME PERIOD</p>	<p>CONCEPTS/COMPETENCIES</p>	<p>STANDARDS/ ELIGIBLE CONTENT</p>	<p>ASSESSMENTS</p>	<p>RESOURCES</p>
<p>Unit 1: Addition and Subtraction of Numbers to 10 and Fluency (9 weeks)</p>	<p><u>Unit 1 Concepts:</u></p> <ul style="list-style-type: none"> ● 1:1 Correspondence ● Number Sense ● Numerical Sequence ● Base 10/Place Value ● Part- Part-Whole ● Addition to 10 ● Knowing what a story problem is asking. 	<p><u>Unit 1 Standards</u> CC.2.2- Algebraic Concepts</p>	<p><u>Unit 1 Assessments:</u></p> <p>Unit Test</p> <p>Writing Numerals 1-30 in a table provided.</p> <p>Doubles Fact Assessment</p> <p><u>Performance Assessments:</u></p> <p>Ordering Numerals 1-30</p> <p>Counting 1-30.</p> <p>Orally Counting to 100</p>	<p><u>Unit 1 Manipulatives:</u></p> <p>Dice</p> <p>Compare Cards</p> <p>120 Charts</p> <p>Ten Frames</p> <p>Red/Yellow Counters</p> <p>Part- Part Whole Mat</p> <p>Number Bonds Mat</p> <p>Flashcards</p> <p>Number Lines</p> <p><u>Technology:</u></p> <p>I Pads- Math Seeds</p> <p>25 Common Core</p>

	<p><u>Unit 1 Competencies:</u> Use addition and subtraction within 20 to solve word problems by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.</p> <p>Add and subtract within 20. Use strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.</p> <p>Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.</p> <p><u>Vocabulary:</u> addend, sum, equal to, more, less, addition, compare, counting on, decompose,</p>		<p>Orally skip count by 2s to 20, 5's to 50, and 10s to 120.</p> <p>Orally count forward and backward (10 consecutive numbers) from any number from 1-100.</p> <p>Informal Assessment</p> <p>Performance Based Assessment</p>	<p>Math Lessons- Gr. 1</p>
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	less than, greater than, analog, hour, making 10, ones, place value, penny, nickel, dime, quarter, tens			
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<p>Unit 2: Place Value, Comparison, Addition and Subtraction of Numbers to 20 (6 weeks)</p>	<p><u>Unit 2 Concepts:</u></p> <p>Numerical Sequence Place Value Addition and Subtraction Properties of Operations</p> <p><u>Competencies:</u> Read and write numerals accurately forward and backward from any number less than 120.</p> <p>Compare two two-digit numbers based on the meanings of tens and ones digits, recording the results of comparisons with the symbols $<$, $>$, $=$</p> <p>Add within 100, including adding a two-digit number and a one digit number, and adding a two-digit number and a multiple of 10 using concrete models or drawings. Relate the</p>	<p><u>Unit 2</u></p> <p>CC.2.1.1.B.1 CC.2.1.1.B.2 CC.2.2.1.A.1 CC.2.2.1.A.2</p>	<p><u>Unit 2</u></p> <p>Unit Test</p> <p>Students add and subtract within 20 to solve word problems.</p> <p>Students use the concept of tens and ones to represent and compare two-digit numbers.</p> <p>Students count by ones and tens beginning with numbers other than 1.</p> <p>Informal Assessment</p> <p>Performance Based Assessment</p>	<p><u>Unit 2 Resources</u></p> <p><u>Manipulatives:</u> Dice Compare Cards 120 Charts Ten Frames Red/Yellow Counters Part- Part Whole Mat Number Bonds Mat Flashcards Base Ten Blocks</p> <p><u>Print:</u> Envisions Miss Giraffe</p> <p><u>Technology:</u> I Pads- Math Seeds 25 Common Core Math Lessons- Gr. 1 Xtra Math</p> <p><u>Online</u> SAS Portal</p>
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	<p>strategy to a written method and explain the reasoning used.</p> <p>Subtract multiples of 10 in the range of 10-90, using concrete models or drawings. Relate the strategy to a written method and explain the reasoning used.</p> <p>Add and subtract within 20. Use strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known sums.</p> <p>Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.</p> <p>Apply properties of operations as strategies to add and subtract</p>			
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	<p>(commutative property of addition; associative property of addition)</p> <p>Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.</p> <p>Apply properties of operations as strategies to add and subtract (commutative property of addition; associative property of addition).</p> <p>Understand subtraction as an unknown-addend problem. For example, subtract, subtract 10-8 by finding the number that makes 10 when added to 8.</p> <p>Vocabulary: addend, sum, equal to, more, less, addition, compare, counting on, compose/ decompose, less than, greater than, analog, hour,</p>			
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<p>UNIT 3 Unit 3: Ordering and Expressing Length Measurements as Numbers and Telling Time (4 weeks)</p>	<p>making 10, ones, place value, penny, nickel, dime, quarter, tens</p> <p>UNIT 3 Concepts:</p> <ul style="list-style-type: none"> • Measurement • Represent and Interpret Data <p>Competencies:</p> <ul style="list-style-type: none"> • Add and subtract within 20. Use strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction; and creating equivalent but easier or known 	<p>UNIT 3 CC.2.4: Measurement, Data and Probability</p>	<p>UNIT 3 Unit Test</p> <p>Students use units correctly to measure length?(no gaps or overlaps)</p> <p>Students use same-size units to measure length.</p> <p>Students order objects according to length.</p> <p>Students use the make 10 strategy.</p> <p>Students tell time to the hour; Half-hour.</p> <p>Students write the time</p>	<p>UNIT 3 Manipulatives: 1 inch tiles paperclips snap cubes inch rulers</p> <p>Print: Envisions Miss Giraffe</p> <p>Technology: I Pads- Math Seeds 25 Common Core Math Lessons- Gr. 1 Xtra Math</p> <p>Online SAS Portal</p>
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	<p>sums.</p> <ul style="list-style-type: none"> • Order three objects by length; compare the lengths of two objects indirectly by using a third object • Use standard and non-standard units of measure to express the length of an object as a whole number of length units • Tell and write time in hours and half hours using analog and digital clocks <p>Vocabulary:less than, greater than, length, hour, half hour, compare, analog, compose/decompose, making ten</p>		<p>shown on a clock.</p>	<p>-</p>
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<p>Unit 4: Place Value, Comparison, Addition and Subtraction of Numbers to 40 (7 weeks)</p>	<p><u>Unit 4:</u> Concepts/Competencies</p> <p>place value</p> <p>addition & subtraction</p> <p>represent and interpret data</p> <p>At the end of this unit:</p> <ul style="list-style-type: none"> ● decompose numbers into tens and ones ● represent and solve addition/subtraction problems to 40 ● gather and represent data in tables/charts ● use data in tables/charts to solve problem ● represent and solve different types of addition & subtraction word problems 	<p><u>Unit 4 Numbers and Operations</u></p> <p>CC.2.1.1.B.2: Use place value concepts to represent amounts of tens and one and to compare two digit numbers.</p> <p>CC.2.2.1.A.1 Represent and solve problems involving addition and subtraction within 20</p> <p>CC.2.4.1.A.4 Represent and interpret data using tables/charts.</p>	<p><u>Unit 4: Assessments</u></p> <p>Unit Test</p> <p>Informal Assessment</p> <p>Performance Based Assessment</p>	<p><u>Unit 4: Resources</u></p> <p><u>Manipulatives:</u> Dice Compare Cards 120 Charts Ten Frames Red/Yellow Counters Part- Part Whole Mat Number Bonds Mat Flashcards Number Lines Place Value Mats</p> <p><u>Print:</u> Envisions Miss Giraffe</p> <p><u>Technology:</u> I Pads- Math Seeds 25 Common Core Math Lessons- Gr. 1 Xtra Math</p> <p><u>Online</u> SAS Portal</p>
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<p>UNIT 5: SHAPES Unit 5: Identify, Compose and Partition Shapes (3 weeks)</p>	<p>UNIT 5: SHAPES Concepts</p> <ul style="list-style-type: none"> • Two and three Deimensional • Fractions <p>Competencies</p> <ul style="list-style-type: none"> • Compose two and three dimensional shapes and distinguish between attributes • Build and draw shapes to possess attributes. • Partition circles and rectangles into two and four equal shares. Understand that decomposing into more equal shares creates smaller shares. <p>VOCABULARY</p> <ul style="list-style-type: none"> • Compose/decompo se, trapezoids, half circles, quarter-circles, triangle, cube, rectangular prism, cone, cylinder 	<p>UNIT 5 : SHAPES</p> <p>CC.2.3.A.1 Geometry CC.2.3.1.A.2</p>	<p>UNIT 5: SHAPES</p> <p>Unit Test</p> <p>Informal Assessment</p> <p>Performance-Based Assessment</p> <ul style="list-style-type: none"> • Students identify two and three dimensional shapes • Create shapes from smaller shapes • Decompose a shape into halves and fourths • Compare shapes based on their attributes 	<p>UNIT 5: SHAPES</p> <p><u>Manipulative:</u></p> <ul style="list-style-type: none"> • pattern blocks • 3D Shapes • 2D shapes • Flashcards • Geoboard • Footprint cards • shape challenge cards • SAS portal <p>TECHNOLOGY</p> <ul style="list-style-type: none"> • Math Seeds Website
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<p>Unit 6: Place Value, Comparison, Addition and Subtraction of Numbers to 100 (6 weeks)</p>	<p>halves, fourths, quarters</p> <p>Unit 6 Concepts:</p> <ul style="list-style-type: none"> • Place Value • Addition and Subtraction • Properties of Operations 	<p>Unit 6</p> <p>CC.2.1: Numbers and Operations CC.2.1.1.B.2 Place Value CC.2.1.1.B.3 Place Value CC.2.2.1.A.1 Addition and Subtraction CC.2.2.1.A.2 Operations</p>	<p>Unit 6</p> <p>Unit Test</p> <p>Use strategies to add and subtract: counting all, counting on, making 10, and using doubles</p> <p>Understand that adding is putting together and subtracting is taking away, taking apart, or comparing</p> <p>Understand the relationship between missing addend and subtraction</p> <p>Represent work in multiple ways, e.g. drawings, objects, and/or numbers</p>	<p>Unit 6 Resources</p> <p><u>Manipulatives:</u> Dice Compare Cards 120 Charts Ten Frames Red/Yellow Counters Part- Part Whole Mat Number Bonds Mat Flashcards Base Ten Blocks</p> <p><u>Print:</u> Envisions Miss Giraffe</p> <p><u>Technology:</u> I Pads- Math Seeds 25 Common Core Math Lessons- Gr. 1 Xtra Math</p> <p><u>Online</u> SAS Portal</p>
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