Trinity Area School District
Template for Curriculum Mapping

Course: Elementary Math **Grade: 1** **Designer: Math Committee**	**Overview of Course: Overview of Course: Students will understand whole numbers, addition, subtraction, geometry, fractions, and measurement and be able to solve real world problems using these concepts and procedures.**

Overarching Big Ideas, Enduring Understandings, and Essential Questions

- Make sense of problems and persevere in solving them.
- 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 structure.
- Look for and express regularity in repeated reasoning.

Big Idea	**Standard(s) Addressed.** PA Standards – Blue National Standards – Red	**Enduring Understanding(s)** Kid Friendly - Purple	**Essential Question(s)** Kid Friendly - Purple
Problem Solving	**CC.2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic**	Doing mathematics involves a variety of processes including problem solving, reasoning, communicating, connecting, and representing. To solve problems, we need to understand them first.	How can words and phrases be translated into numerical expressions? How can information and computation be shown visually using pictures or diagrams? How can drawings and pictures help us solve problems?
Writing to Explain	**CC.2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic**	Mathematical explanations can be given using words, pictures, numbers, or symbols. A good explanation should be correct, simple, complete,	How can computational steps be explained to demonstrate understanding of mathematical thinking and processes?

		and easy to understand. People need to explain their answers.	How can we explain what we are doing in math and prove that it is correct?
Discovery	CC.2.2.1.A.1 Represent and solve problems involving addition and subtraction within 20. 1.OA.1 Represent and solve problems involving addition and subtraction. • Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions, eg., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	Numbers are made of parts that can be manipulated. Problems can be solved in many different ways.	How can addition and subtraction problem be represented and solved? What are different ways problems can be solved?
Order	CC.2.2.1.A.1 Represent and solve problems involving addition and subtraction within 20. 1.OA.2 Represent and solve problems involving addition and subtraction. • Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20. E.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	Three numbers can be grouped and added in any order. There are different ways that three numbers can be added together.	How can you add three numbers?
Properties	CC.2.2.1.A.2 Understand and apply properties of operations	Two numbers can be added in any order.	Does changing the order of the addends change the sum?

	and the relationships between addition and subtraction. 1.OA.3 Understand and apply properties of operations and the relationship between addition and subtraction. • Apply properties of operations as strategies to add and subtract. Examples: If 8+3=11 is known, then 3+8=11 is also known. (Commutative property of addition.) To add 2+4+4, the second two numbers can be added to make a ten, so 2+6+4=2+10=12. (Associative property of addition.)		How can three numbers be added together? When do two or three groups join together to become one? Explain. How can two numbers be added together? How can you think of 10 to solve an addition problem with three numbers?
Relationships	CC.2.2.1.A.2 Understand and apply properties of operations and the relationships between addition and subtraction. 1.OA.4 Understand and apply properties of operations and the relationship between addition and subtraction. • Understand subtraction as an unknown-addend problem. For example, subtract 10-8 by finding the number that makes 10 when added to 8.	Addition and subtraction have an inverse relationship. The inverse relationship between addition and subtraction can be used to solve subtraction facts. Addition and subtraction are closely related. People understand subtraction as an unknown-addend problem. Every subtraction fact has a related addition fact.	How can you use addition to help you subtract? How can a missing part be determined when the other part is known?
Patterns	CC.2.2.1.A.1 Represent and solve problems involving addition and subtraction within 20. 1.OA.5 Add and subtract within 20.	The number relationships of 0, 1 more than, and 2 more than are the basis for addition facts with a 0, 1, and 2. The number relationships of 0, 1 less than, and 2 less than are the basis for subtraction facts	What are helpful strategies for addition facts and subtraction facts with 0, 1, and 2? How can you express the relationship between two numbers that are 1 or 2 more than or fewer than each other?

	• Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	with a 0, 1, and 2. Numbers can be used to tell how many.	
Systems	CC.2.2.1.A.1 Represent and solve problems involving addition and subtraction within 20. 1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. • Use strategies such as counting on; making ten (e.g., 8+6=8+2+4=10+4=14); decomposing a number leading to a ten (e.g., 13-4=13-3-1=10-1=9); using the relationship between addition and subtraction (e.g., knowing that 8+4=12, one knows 12-8=4), and creating equivalent but easier or known sums (e.g., adding 6=7 by creating the known equivalent 6+6+1=12+1=13).	Ten can be shown in two parts in different ways and represented using addition and subtraction number sentences. Addition and subtraction have an inverse relationship. Basic addition and subtraction facts that are near doubles can be found using a related doubles fact. Different strategies can be used to help us add and subtract quickly.	How can you think of 10 to solve an addition or subtraction problem? How are addition and subtraction related? How can you use doubles facts to find the answer to a near doubles fact?
Equality	1.OA.7 Work with addition and subtraction equations. • Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6=6, 7=8-1, 5+2=2+5, 4+1=5+2.	Equal means to have the same amount, size, number or value.	What does the sign of "=" mean? How do you, personally, make sense of the equal sign? Why is it important to have equality at times? Give an example of when being "equal" matters. Explain why it matters.
Correlation	1.OA.8 Work with addition and subtraction equations.	A missing part of a whole can be found when the whole and the other part is known.	How can a missing part be determined when the other part is known?

	• Determine the unknown whole number in an addition or subtraction equation relating to three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8+?=11, 5=?-3, 6+6=?.	Problems can be solved by finding the missing part.	
Representation	CC.2.1.1.B.1 Extend the counting sequence to read and write numerals to represent objects. 1.NBT.1 Extend the counting sequence. • Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	Counting tells how many are in a set. Numbers can be used to tell how many.	How can you find how many are in a set? How can you express the relationship between a number of objects and a numeral?
Base Ten Numeration	CC.2.1.1.B.2 Use place value concepts to represent amounts of tens and ones and to compare two digit numbers. 1.NBT.2 Understand place value. • Understand that the two digits of a two-digit number represent amounts as tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones – called a “ten.” b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50,	When objects are grouped in sets 10 and leftovers (ones), counting the groups of ten and adding ones tells how many there are in all. Numbers can be used to tell how many. Sets of 10 can be perceived as single entities. In a standard numeral, the tens are written to the left of the ones. The decade numbers to 100 are built on groups of ten. Numbers greater than 10 can be represented as the sum of the tens and the ones.	When objects are grouped in sets of 10 and leftovers (ones), how do you write the number for how many there are in all? How can a number be broken into groups of 10 and leftover ones? How many tens make up each of the decade numbers from 10 through 90? How does adding the values of the digits produce the total value of the number?

	60, 70, 80, 90 refer to one, tow, three, four, five, six, seven, eight, or nine tens (and 0 ones).		
Comparison	CC.2.1.1.B.2 Use place value concepts to represent amounts of tens and ones and to compare two digit numbers. 1.NBT.3 Understand place value. • Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >,=, and <.	Place value can be used to compare and order numbers.	For any two-digit numbers, how can you identify the greater number?
Algorithms	CC.2.1.1.B.3 Use place value concepts and properties of operations to add and subtract within 100. 1.NBT.4 Use place value understanding and properties of operations to add and subtract. • 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 and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and	When adding tens to a two-digit number, only the tens digit changes. The traditional algorithm for adding a two-digit number and a one digit number starts by adding ones. Sometimes 10 ones need to be renamed as 1 ten. Then the tens are added.	What changes when you add tens to a two-digit number and why? How do two-digit numbers change when multiples to ten are added to them? How do you know when to regroup when adding to a two-digit number?

	sometimes it is necessary to compose a ten.		
Connections	CC.2.1.1.B.3 Use place value concepts and properties of operations to add and subtract within 100. 1.NBT.5 Use place value understanding and properties of operations to add and subtract. • Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	10 more and 10 less express a relationship between two numbers.	How is a number changed when its tens digit is changed by 1?
Algorithms	CC.2.1.1.B.3 Use place value concepts and properties of operations to add and subtract within 100. 1.NBT.6 Use place value understanding and properties of operations to add and subtract. • Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range from 10-90 (positive or 0 differences), 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 and explain the reasoning used.	When subtracting tens from a two-digit number, only the tens digit changes.	How can you use a hundreds chart to subtract tens from a two-digit number? How do two-digit numbers change when multiples of ten are subtracted from them and why?
Comparison	CC.2.4.1.A.1 Order lengths and measure them both indirectly and by repeating length units.	Objects can be compared and ordered by size and length.	How can you compare and then order concrete objects according to length?

	1.MD.1 Measure lengths indirectly and by iterating length units. • Order three objects by length; compare the lengths of two objects indirectly by using the third object.		
Measurement	CC.2.4.1.A.1 Order lengths and measure them both indirectly and by repeating length units. 1.MD.2 Measure lengths indirectly and by iterating length units. • Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object(the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.	Measurement is a process of comparing a unit to the object being measured. The length of any object can be used as a measurement unit for length. Objects can be put in order by length. Different objects can be used to help describe the lengths of other objects.	How can you measure the length of objects with nonstandard units? What could you use to measure the length of an object and how? When might we have to measure in real life?
Time	CC.2.4.1.A.2 Tell and write time to the nearest half hour using both analog and digital clocks. 1.MD.3 Tell and write time. • Tell and write time in hours and half-	Time to the hour can be shown on an analog clock or on a digital clock and can be written in different ways. People tell time to the nearest hour and half hour using different types of clocks everyday. Time can be given to the half hour.	What are the different ways that you write and see times on clocks? How do you tell and write time to the half hour? Explain. When do you, personally, have to tell time? Why?

	hours using analog and digital clocks.		
Representation	CC.2.4.1.A.4 Represent and interpret data using tables/charts. 1.MD.4 Represent and interpret data. • Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	Each type of graph is appropriate for certain kinds of data. Graphs make it easy to compare and analyze data. Some problems can be solved by making, reading, and analyzing a graph. Objects can be grouped in ways that they are alike. These different ways can be explained. People show information by using pictures, bar graphs, tally charts and picture graphs. I can use the terns "largest, smallest. Most often, least often" when we talk about them.	What questions can you answer by looking at a graph? How can you create a graph to show information and answer questions?
Exploration	CC.2.3.1.A.1 Compose and distinguish between two- and three-dimensional shapes based on their attributes. 1.G.1 Reason with shapes and their attributes. • Distinguish between defining attributes (e.g., triangles are closed and three sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	Plane shapes have many properties that make them different from one another. Shapes have names and can be drawn and described based on the ways they look All objects are made up of shapes and have defining and non-defining attributes. Everything around us in the world is made up of different shapes.	How can identifying the properties of plane shapes help you sort the shapes? How can you identify attributes of plane shapes?
Transformations	CC.2.3.1.A.1 Compose and distinguish between two- and three-dimensional shapes based on their attributes.	Two and three dimensional shapes can be combined to make new shapes. Two and three dimensional shapes can be broken apart into other shapes.	How can plane shapes be combined to make new plane shapes? How can breaking apart larger shapes make new smaller shapes?

	1.G.2 Reason with shapes and their attributes. • Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half circles, and quarter circles) or three dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.	Shapes can be put together or broken apart to create a new /different shape(s).	
Perspective	CC.2.3.1.A.2 Use the understanding of fractions to partition shapes into halves and quarters. 1.G.3 Reason with shapes and their attributes. • Partition circles and rectangles into two and four equal shares, describe the shares using halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shapes.	A region can be divided into equal-sized parts in different ways. There are different ways to divide a shape or an object into equal parts. Some sets can be divided into equal parts. Equal parts of a set have the same number of objects in each part.	How can you divide a shape into equal parts? How can you describe equal parts of a whole? How can you show and describe parts of a set?

Big Ideas, Enduring Understandings, and Essential Questions Per Unit of Study (These do NOT "spiral" throughout the entire curriculum, but are specific to each unit.)							
Month of Instruction (In what month(s) will you teach this unit?)	**Title of Unit**	**Big Idea(s)** (A Big Idea is typically a noun and always transferable within and among content areas.)	**Standard(s) Addressed** (What Common Core Standard(s) and/or PA Standard(s) addresses this Big Idea?)	**Enduring Understanding(s)** (SAS refers to Enduring Understandings as "Big Ideas." EUs are the understandings we want students to carry with them after they graduate. EUs will link Big Ideas together. Consider having only one or two EUs per Big Idea.)	**Essential Question(s)** (Essential Questions are broad and open ended. Sometimes, EQs can be debated. A student's answer to an EQ will help teachers determine if he/she truly understands. Consider having only one or two EQs per Enduring Understanding.)	**Common Assessment(s)*** (What assessments will all teachers of this unit use to determine if students have answered the Essential Questions?)	**Common Resource(s)* Used** (What resources will all teachers of this unit use to help students understand the Big Ideas?)
August/ September	Numbers to 12	Relations	CC.2.1.1.B.1 Extend the counting sequence to read and write numerals to represent objects.	Counting tells how many are in a set. Numbers can be thought of as 5 and some more or 10 and some more. The number of objects in a patterened arrangement can be recognized without counting. Problems can be solved by using objects to act them out.	How can you find how many are in a set? How can the number of objects arranged in a pattern be named without counting? How can you use a pattern to find a number without counting? How can you use objects to act out and solve problems?	**TBA**	Topic 1

September	Comparing and Ordering Numbers	Comparison	CC.2.1.1.B.2 Use place value concepts to represent amounts of tens and ones and to compare two digit numbers.	Two different numbers can be related usinf "greater than" and "less than." There is a specific order to the set of whole numbers. Numbers are listed in order from the least to the greatest.	How can the terms greater than and less than express the relationship between two different numbers? How can you compare two numbers?	**TBA**	Topic 2 • more • fewer • greater than • less than • least • greatest • between • before • after
October							
November							

December							
January							
February							
March							

April							
May							
June							

* Some teachers may need to think about the assessments and resources used in order to determine the Big Ideas, Enduring Understandings, and Essential Questions embedded in their courses. At this point in your curriculum mapping, you might want to ignore the "Common Assessments" and "Common Resources Used" columns. However, you may use them if you wish.