Curriculum Map for: **Kindergarten Mathematics**

Prerequisites: Completion of Pre-Kindergarten or Determination of Kindergarten Readiness

Scope: At the core are number sense and operations of whole numbers. Understanding of measurement and geometry contribute to the classification of objects by size, color, and shape. The process strands of problem solving and representation utilize counting and modeling with manipulatives based on literature or storytelling. Concepts of measurement and time are investigated. Questions posed help the students gather data about themselves and their surroundings.

Assessment:

Assessment comes in a variety of forms and wherever possible should be used to reflect and enhance the teaching and learning process that occurs in a classroom. Assessment should not be seen as a separate activity, but as an integral part of the teaching and learning process. Alternative assessments apply to any and all assessments that differ from multiple choice, timed, one-shot approaches that characterize most standardized and classroom assessment. Authentic assessments are assessments that engage students in applying knowledge and skills in the same way they are used in the real-world. Performance assessment is a broad term, encompassing many of the characteristics of both authentic and alternative assessments.

As this course of study demonstrates, it is clear that no single type of assessment could provide an accurate measurement of the learning experience. Students should have the best opportunity to demonstrate their understanding of the learning experience. Therefore, it is suggested that a variety of data gathering methods be used such as objective tests, observations, products, written reports, performances and a collection of student works.

This Curriculum Map:

This document contains four different columns available to the user. The **TIME** column offers a suggested timeline so that all topics in the **CONTENT/SKILLS** column are feasibly met. It is understood that times will need to be adjusted as the course develops. The mapping of content to present textbooks can occur in the **C/S** column. The **PERFORMANCE INDICATOR** column aligns topics in **C/S** with the NYS Standards. The **APPLICATION/PROJECT IDEAS** column is designed to offer unique or novel suggestions and sources for the teacher

TIME	CONTENT / SKILLS	PERFORMANCE INDICATOR	APPLICATIONS / IDEAS
Throughout the year	Position/sorting and classification/color, shape identification/logical reasoning/patterning/graphing/ sequence of events/ calendar skills including days of the week, months of the year, seasons, yesterday, today and tomorrow.		Math is integrated in many ways throughout the curriculum. The use of manipulatives and journals is essential to the program. Literature can provide a way to introduce or reinforce a concept. Worksheets are useful tools for reinforcing skills and checking for understanding.

TIME	CONTENT / SKILLS	PERFORMANCE INDICATOR	APPLICATIONS / IDEAS
September	**Position & Sorting SF Ch. 1 (TM 1)** Sections A: Position and Location	**K.G.5** Understand and use ideas such as over, under, above, below, on, beside, next to, and between. **K.G.1** Describe characteristics and relationships of geometric objects	K.G.5a Hide objects in the room and give students positional directions to lead them to the objects. After completing this activity, divide the class into pairs and allow the pairs to hide the objects. Have students use positional directions to guide each other to hidden objects. K.G.1a Give students magazines to look through. Make a chart like the one below and ask students to cut out pictures of triangles, squares, circles, and rectangles. Have students glue the items in the correct place on the chart. When the chart is full, discuss the similarities and differences among the shapes. square circle triangle rectangle
	Section B: Sorting and Classifying Children are evaluated in September to see if they have already mastered these concepts. Concepts are reinforced throughout the year in Math center activities, use of manipulatives, cross-curricular activities, etc.	**K.G.2** Sort groups of objects by size and size order (increasing and decreasing) **K.S.3** Sort and organize objects by one attribute with increasing difficulty to two attributes (e.g., color, size, or shape) by the end of the year.	K.G. 2 Place five objects of varying height on a desk in front of the room. Ask students to describe how to sort the objects by size. Discuss increasing and decreasing size, changing the order from small to large, then large to small. K.S.3a Give students pieces of paper in shapes of different colors and sizes. Have students sort the big squares, the small yellow shapes, etc. Then have students suggest their own sorting rules.

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October	**Graphing & Patterns- SF-Ch.2 (TM1)** Section A : Graphing	**K.S.1** Gather data in response to questions posed by the teacher and students	**Introduced in the Fall and reinforced throughout the year.** Graphing- K.S.1a Discuss the following questions: How do you get to school in the morning? How can you record this information? (Students might make a chart to record how many children in the class get to school by car, by bus, by walking, etc.
		K.S.2 Help to make simple pictographs for quantities up to 10, where one picture represents 1	Construct an apple tasting graph after tasting a variety of apples. Student preferences are represented by individual cards/post-its, etc. During daily calendar activities, students graph the weather conditions of the day.

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October	**Graphing & Patterns- SF-Ch.2 (TM1)** Section A : Graphing	**K.S.4** Represent data using manipulatives **K.S.5** Identify more, less, and same amounts from pictographs or concrete models	K.S.4a Divide the class into small groups. Distribute red and blue interlocking cubes to each group. Have students use the blocks to represent their group: • boys and girls in the group • pet owners and non pet owners in the group • sneakers and non-sneakers in the group • shirt buttons and no shirt buttons in the group. Using individual snack bags, students graph data by color. This activity can be done with M&M's, fruit snacks, skittles, etc. Upon completing the graph, students identify what color was represented most, least, and the same number of times.
October	**Patterning is introduced in the Fall and reinforced throughout the year. As the year progresses, the type of pattern will vary and the level of difficulty will increase.** Section B: Understanding and Extending Patterns Section C: Comparing and Creating Patterns	**K.A.1** Use a variety of manipulatives to create patterns using attributes of color, size, or shape	It is helpful to first demonstrate a simple pattern , having students identify and then reproduce the given pattern using the same manipulatives. Encourage students to clap, snap, pat knees, etc. to help make the pattern more concrete.

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		K.A.2 Recognize, describe, extend, and create patterns that repeat (e.g., ABABAB or AABBAABB)	K.A.2a Create an ABAB growing pattern with yellow and red links. Guide students to identify it as an ABAB pattern. Give students an opportunity to use other sorting objects to create their own ABAB patterns. Increase pattern complexity to AABB for students who are ready. Have students draw a picture of their patterns for a bulletin board. **Emphasis should be placed on the repetitive property of patterns.**

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November	**Number identification and formation**	Deliberate instruction must be provided for correct number identification and formation. While many students enter kindergarten with some prior knowledge, kindergarten instruction provides the necessary mathematical background for these essential skills.	**Continue activities and reinforce skills in sorting, graphing and patterning.** Use white boards, chalkboards, playdoh, sand trays, etc. with or without a partner to practice writing numbers. Many teachers also find it helpful to send home a practice packet with proper formation and several opportunities for writing each number. There are several number rhymes and chants used to help children commit formation to memory. The use of practice worksheets is essential for needed practice.
	Numbers through 5 SF-Ch.3 (TM1) Section A: Understanding Numbers through 5 Section B: Using Numbers through 5	**K.N.1** Count the items in a collection and know the last counting word tells how many items are in the collection (1-5)	K.N.1a Give each student a random set of manipulatives. Have them count the number of items, identifying the quantity in the set by telling the last counting word.
		K.N.2 Count out (produce) a collection of a stated size 1-5	K.N.2a Using a random set of manipulatives, have students show a specified set.
		K.N.3 Numerically label a data set of 1-5	K.N.3a Give the students a random set of manipulatives. Have student draw a picture to represent the number of items they have and then write the correct number to label the set
November	**Numbers through 5 SF-Ch.3 (TM1)**	**K.N.4** Verbally count by 1's to 5	K.N.4a Have students sit in a circle and pass a beanbag around the circle as they count to 5. Each pass counts as one. Ask the students to guess who will be holding the beanbag at 5. Keep repeating the process so that every student gets the opportunity to pass the beanbag.

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		K.N.5 Verbally count backwards from 5	K.N.5a After the class has lined up to exit the room, count backwards from 5 together in a whisper to determine when it is time to leave. By zero all students should be standing quietly, waiting to leave the room. Begin with 5 at the start of the school year and work up to 10.
		K.N.6 Represent collections with a finger pattern up to 5	K.N.6a Give each student a set of manipulatives and ask them to show, using fingers, how many items they have.
		K.N.7 Draw pictures or other informal symbols to represent a spoken number up to 5	K.N.7a Make a five-page number book for each student. Have the students create a cover for their own number book. Give verbal directions for students to draw one circle on the first page, two triangles on the second, three suns on the third, etc.

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November		**K.N.8** Draw pictures or other informal symbols to represent how many in a collection up to 5	K.N.8a Give each pair of students a piece of paper and a cup with various amounts of buttons. Then have the students count the buttons and draw buttons on the paper to match the number of buttons in the cup.
		K.N.9 Write numbers 1-5 to represent a collection **K.N.10** Visually determine how many more or less, and then using the verbal counting sequence, match and count 1-5	K.N.9a Use a worksheet to have students count and numerically label given sets. K.N.10a Form 2 towers of unifix cubes. Ask the students to determine which tower has more simply by looking at the towers, with no counting. Then together count to determine how many cubes are in each tower. Place the two towers next to each other as in a graph. Match up the cubes in the first tower with the corresponding cubes in the second tower. Count the remaining cubes to show how many MORE are in the second tower.
		K.N.11 Use and understand verbal ordinal terms, first to fifth	K.N.11a Line students up. Ask students to identify who is first, second, third, etc. Then, ask students to point to the second, fourth and first child, out of order.
December	**Numbers through 10 SF-Ch. 4 (TM2)** Section A: Understanding Numbers 6-10 Section B: Using Numbers 6-10	**K.N.1** Count the items in a collection and know the last counting word tells how many items are in the collection (1-10)	Repeat the above listed activities and games using sets of 0-10.
		K.N.2 Count out (produce) a collection of a stated size 1-10	
		K.N.3 Numerically label a data set of 1-10 **K.N.4** Verbally count by 1's to 10	
		K.N.5 Verbally count backwards from 10 **K.N.6** Represent collections with a finger pattern up to 10	

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		K.N.7 Draw pictures or other informal symbols to represent a spoken number up to 10 **K.N.8** Draw pictures or other informal symbols to represent how many in a collection up to 10 **K.N.9** Write numbers 1-10 to represent a collection **K.N.10** Visually determine how many more or less, and then using the verbal counting sequence, match and count 1-10 **K.N.11** Use and understand verbal ordinal terms, first to tenth	

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January/ transition period	**Review skills presented thus far.**		
January/ full day	**Numbers through 31 SF-Ch. 5 (TM2)** Section A: Numbers 11 through 20	Organization of data representing higher numbers to 20 Draw pictures or other informal symbols to represent how many in a collection up to 20	Give each student a piece of paper and a random number of 2 sided counters from 1-20. Then have the students count the set and draw symbols on the paper to match the number of items in the set. Using a worksheet, the students count groups of objects and circle the correct number to match the number in the set.
February	Section B: Numbers through 31 Section C: Using Numbers through 31	Count and write numbers to 31 Compare sets to 31 Count the items in a collection and know the last counting word tells how many items are in the collection (sets to 30) and match to a numeral	Use white boards, chalkboards, playdoh, sand trays, etc. with or without a partner to practice writing numbers. Many teachers also find it helpful to send home a practice packet with proper formation and several opportunities for writing each number. Form 2 towers of unifix cubes. Ask the students to determine which tower has more simply by looking at the towers, with no counting. Then together count to determine how many cubes are in each tower. Place the two towers next to each other as in a graph. Match up the cubes in the first tower with the corresponding cubes in the second tower. Count the remaining cubes to show how many MORE are in the second tower.
February	**Counting & Number Patterns to 100 SF-Ch.12 (TM 4)** Section A: Numbers to 100 Section B: Skip Counting	Skip counting by 10's to 100	Use tens frames and 2 sided counters to provide a visual representation of number concepts. Using groups of ten, students count sets to 100.

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	Measurement SF- Ch. 6 (TM 2) Section A: Length Section B: Capacity, Weight and Temperature	**K.M.1** Name, discuss, and compare attributes of length (longer than, shorter than)	K.M.1a Cut yarn of various colors into different lengths. Give each student a piece of yarn. Pair the children up and ask them to determine which piece of yarn is longer and which is shorter. Have them share their findings by stating either "My piece of yarn is longer than Matthew's piece of yarn." or "My piece of yarn is shorter than Rachel's piece of yarn." Have the students switch partners many times.

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March	Measurement concepts are introduced and reinforced throughout the year with the use of math journals, centers, and cooking projects. It is recommended that more emphasis be placed on linear measurement and comparisons and less on capacity and weight. The concept of temperature is covered through the STC Weather Kit used throughout the year.	**K.M.2** Compare the length of two objects by representing each length with string or a paper strip Use non-traditional tools to measure and report different objects.	K.M.2a Provide students with a variety of materials such as a paper clip, a marker, a pencil, a building block, and a book. Have students choose two objects from the collection. Ask the students to guess which item is longer. Have students cut a piece of string to represent the length of each of the objects. Guide the students to compare the lengths of the two pieces of string to determine which is longer and which is shorter. Students use unifix cubes, paper clips, counting bears, etc. to measure objects in the classroom. Emphasis should be placed on using appropriate tools (height can't be measured by using counting bears, etc.) and reporting should be done using accurate labels. (If you use unifix cubes to measure, your answer should be reported in unifix cubes.)
	Geometry and Fractions SF Ch 8 (TM 3)	**K.G.3** Explore vertical and horizontal orientation of objects	K.G.3a Divide the class into small groups. Provide each group with a small sampling of geometric blocks. Hold up a rectangular block in a vertical position. Ask the students to find the matching block in their sets and hold it up in a horizontal position. Repeat with other blocks.
April	**Geometry and Fractions SF Ch 8 (TM 3) continued**	**K.G.4** Manipulate two- and three-dimensional shapes to explore symmetry Explore dividing groups or objects into 2 equal parts	Show several different symmetrical paper kites. Explain symmetry, using the kites (folding the kite in 1/2 to show the line of symmetry). Ask the students to compare the symmetrical designs of the kites. Use food for this lesson

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		Identify basic solids including sphere, cube, cylinder and cone	Use manipulatives to find the 2 dimensional shapes within the solid. For example, a cylinder has circles as bases. Also, use the solids to help children understand the concept of halves.
	Time and Money SF Ch. 7 (TM 3) The concept of calendar time is covered throughout the year. **It is suggested that not too much emphasis be placed on the concept of clock time and money in kindergarten. These concepts are heavily emphasized in first and second grade.**	**K.M.3** Relate specific times such as morning, noon, afternoon, and evening to activities and absence or presence of daylight	K.M.3a Ask students to act out various activities they might participate in during the morning (e.g., eating breakfast, brushing their teeth, waking up, going to school). Repeat this process for activities they might participate in around noon, in the afternoon, in the evening and at night. Have students take turns telling stories of what a child does during a day. Ask the other students to act out the story.
	Section A: Calendar Time Section B: Clock Time	Introduce telling time to the hour using a variety of clocks.	Introduce the story of Hickory Dickory Dock to help students learn location of numbers on the clock.
	Section C: Money	Identify penny, nickel, dime and quarter Name the value of the penny, nickel and dime	Use manipulatives to compare and recognize the 4 basic coins Many teachers use a classroom store to help students understand the value of coins and give practice counting money
May	**Readiness for Addition & Subtraction SF Ch. 9 (TM 3)** Section A: Part-Part-Whole Section B: Number Relationships Understanding Addition SF Ch.10 (TM 4) Section A: Joining Groups Section B: Addition Sentences	**K.N.12** Solve and create addition and subtraction verbal word problems (use counting-based strategies, such as counting on and to ten) **K.N.13** Determine sums and differences by various means Add and subtract 1 digit numbers to 10	K.N.12a Ask students questions such as the following: Maria has 5 pieces of candy. Juan gives Maria 3 more pieces of candy. How many pieces of candy does Maria have now? (Guide students to start with 5 and simply count up 3 more to 8.) Jacob has 10 toy cars. Jacob gives 4 cars to Mike. How many cars does Jacob have left? (Guide students to count backward from 10 to 6.) Give students opportunities to make up their own verbal word problems.

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June	**Understanding Subtraction SF Ch. 11(TM 4)** Section A: Subtraction Stories Section B: Subtraction Sentences	**K.N.12** Solve and create addition and subtraction verbal word problems (use counting-based strategies, such as counting on and to ten) **K.N.13** Determine sums and differences by various means Add and subtract 1 digit numbers to 10	K.N.13a Have students sit facing a chalkboard or chart paper. Tell the following stories and ask the students to act them out and solve the problems. Ask different students to assist in recording the number sentences. Four friends sat together at lunch. (Ask a student to record the beginning number.) Three more friends joined them. (Ask another student to record the second number with the operation sign.) How many friends are eating lunch together now? (After students determine the number, ask one student to record the number with the equals sign.) --- Ten friends were outside playing with blocks. (Record number) Three friends went to play in the house. (Record number and operations sign) How many friends are left playing with the blocks? (Record number with equal sign) Guide students to write - and =.