Grade 5 Math	Unit 1: Number Properties & Operations		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*

1. How do whole numbers, fractions, and decimals relate to each other?
 	
 2. How can I determine the value of a number?
 	
 3. How do I know when to use estimation and how does it help me in performing everyday computations?
 	
 4. Why do I need to know how to add, subtract, multiply, and divide?
	<u>Program of Studies</u>
	
	 ❑ *NC-1 read, write, and model whole numbers from 0 to 100,000,000, developing place value for ten millions and one hundred millions.*
	 ❑ *NC-2 order and compare numbers to 100,000,000.*
	 ❑ *NC-3 use factors to determine prime and composite numbers.*
	 ❑ *NC-4 determine least common multiples.*
	 ❑ *NC-5 explore appropriate estimation procedures.*
	 ❑ *NC-6 compare and apply the relative sizes of common and mixed fractions.*
	 ❑ *NC-7 investigate multiple representations of equivalent fractions (e.g., 1/2 = 3/6, mixed numbers 1 1/2 = 3/2) with manipulatives, drawings, and fractional notation.*
	 ❑ *NC-8 read, write, and identify decimals through ten-thousandths.*
	 ❑ *NC-9 add and subtract simple fractions with common denominators using manipulatives or symbolic notation.*
	 ❑ *NC-10 add and subtract decimals to hundredths using manipulatives or symbolic notation.*
	
	 <u>Core Content</u>
	
	 ❑ **MA-05-1.1.1 Students will:**
	    ❑ **apply multiple representations (e.g., drawings, manipulatives, base-10 blocks, number lines, expanded form, symbols) to represent whole numbers (0 to 99,999,999);**
	    ❑ **apply multiple representations (e.g., drawings, manipulatives, base-10**
		❑ Whole number
		 ❑ Expanded form
		 ❑ Place value
		 ❑ Decimal
		 ❑ Equivalent
		 ❑ Computation
		 ❑ Estimate
		 ❑ Prime
		 ❑ Composite
		 ❑ Factors
		 ❑ Multiples
		 ❑ Least common multiple (LCM)
		 ❑ Fraction
		 ❑ Numerator
		 ❑ Denominator
		 ❑ Equivalent
		 ❑ Mixed numbers
		 ❑ Equal sign =
		 ❑ Greater than >
		 ❑ Less than <
		 ❑ Compare
		 ❑ Prime Factorization
		 ❑ Base-10
		 ❑ Operations
		 ❑ Addition
		 ❑ Subtraction
		 ❑ Multiplication
		 ❑ Division
			❑ Locate whole numbers, fractions, and decimals using a media source. Describe how they are used.
			 ❑ Using a number line, order a list of whole numbers, fractions, and decimals from least to greatest or vice versa. 1.1.2 DOK 2
			 ❑ Use factor trees to determine prime factors of a number.
			 ❑ Practice representing a number as a product of its primes by playing the game "**Tree-rific" Factor Race.** 1.5.1 DOK 2
			 ❑ Use the Sieve of Eratosthenes to determine prime and composite numbers. 1.5.1 DOK 2
			 ❑ In writing, define a prime number in your own words and explain how it differs from a composite number and also explain why 2 is the smallest prime number. 1.5.1 DOK 2
			 ❑ Use different colors for multiples on a hundreds chart. Identify the common multiples of any 2 given numbers and then identify the least common multiple. 1.5.1 DOK 2
			 ❑ Show 4 different representations of a number. Use different numbers and share different representations. 1.1.1 DOK 2
			 ❑ Recognize the standard, expanded, and word forms of a number by playing the game "**Three of a Kind**" (Similar to the game "Go Fish"). 1.1.1 DOK 2
			 ❑ Use play money and place value template to illustrate place value and expanded form of a number. 1.1.1 DOK 2
			 ❑ Make a list of items they can afford using a grocery ad and $25. Estimate the total of the items and then find the difference from the estimate and the actual amount. 1.2.1 DOK 2
			 ❑ <u>Open Response</u> Odd/Even; Greater Than/Less Than (using a hundreds chart, (a) list all even numbers less than 56 and (b)list all odd numbers greater than 43; (c) explain how to determine if a number is odd or even). 1.1.2 DOK 2

Grade 5 Math	Unit 1: Number Properties & Operations		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
	blocks, number lines, symbols) to describe commonly-used fractions, mixed numbers, and decimals through thousandths; ❑ **apply these numbers to represent real-world problems and** ❑ **explain how the base 10 number system relates to place value. DOK 2** ❑ MA-05-1.1.2 Students will read, write and rename whole numbers, fractions and decimals and apply to real-world and mathematical problems. ❑ **MA-05-1.1.3 Students will compare (<, >, =) and order whole numbers, fractions and decimals and explain the relationships (equivalence, order) between and among them. DOK 2** ❑ **MA-05-1.2.1 Students will apply and describe appropriate strategies for estimating quantities of objects and computational results in real-world problems. DOK 2** ❑ **MA-05-1.3.1 Students will analyze real-world problems to identify the appropriate mathematical operations and will apply operations to solve real-world problems with the following constraints:** ❑ **add, subtract, multiply, and divide whole numbers (less than 100,000,000), using technology where appropriate;** ❑ **add and subtract fractions with like denominators through 16, with sums less than or equal to one and** ❑ **add and subtract decimals through hundredths. DOK 2** ❑ MA-05-1.3.2 Students will skip-count forward and backward. ❑ MA-05-1.3.3 Students will multiply decimals through tenths.		❑ <u>Open Response</u> Fact Families given three numbers that make up a fact family, write two addition and two subtraction facts(or multiplication and division facts) to show the relationship of the three numbers and explain the grouping of the numbers so that it would help a friend remember how to create fact families. 1.3.1 DOK 2 ❑ With a partner, use fraction manipulatives to compare fractions and to model addition and subtraction of fractions with like denominators (**Investigations 2 & 3**). 1.3.1 DOK 2 ❑ <u>Open Response</u> "Whole Numbers" (Given a list of whole numbers, classify each number as odd or even, order the list of numbers from least to greatest, and find the sum of the greatest odd number and the least even number). 1.1.2 DOK 2 ❑ In groups of three, use fraction strips to help solve a word problem involving fractions. Each group will be given a 12" x 18" sheet of paper that they will fold into four sections and label the four sections (1) Problem (2) Number It (3) Picture It (4) Write It. The group will write a story problem from a math text in the first box, solve the problem with numbers in the second box, use pictures to show the solution in the third box, and explain in words how they solved the problem in the fourth box. "**Number It, Picture It, Write It**!" (could also have students write original problems instead of using problems from a text). 1.3.1 DOK 2 ❑ Create arrays on graph paper to represent prime and composite numbers. Give each student a number between 2 and 30 and direct each student to represent that number on the graph paper with as many arrays as possible. After checking for accuracy, have the students cut out their representations, glue them to construction paper and label. Do this with several numbers. Students should discover that prime numbers could only be represented by arrays with only one row of squares, while composite number can be represented by arrays with one or more rows. As a follow up, have each

Grade 5 Math	Unit 1: Number Properties & Operations		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
	❑ **MA-05-1.5.1 Students will identify and determine composite numbers, prime numbers, multiples of a number, factors of numbers and least common multiples (LCM) and will apply these numbers to solve real-world problems. DOK 2** ❑ MA-05-1.5.2 Students will use the commutative properties of addition and multiplication, the associative properties of addition and multiplication, the identity properties of addition and multiplication and the zero property of multiplication in written and mental computation.		student write a paragraph on the paper explaining the difference between the two types of numbers. "**Array Play**" 1.5.1 DOK 2 ❑ Use a Venn diagram to compare various categories of numbers such as even numbers and multiples of five (this can be applied to many other categories of number). 1.5.1 DOK 2 ❑ <u>Open Response</u> "4-H Camp" given a list of items needed for camp, estimate the total cost of the items and explain the method you used to determine the total cost. 1.2.1 DOK 2 ❑ <u>Open Response</u> "Cupcakes" given the number of cupcakes and the color of icing on each, draw a diagram showing how they could be arranged on a tray and decide if the number of cupcakes (given in fraction form) with each color of icing is the same or different. 1.1.2 DOK 2 ❑ <u>Open Response</u> "Number Sentences" Given number sentences to solve, use arithmetic properties to solve them mentally and then explain the property that made the problem easy to do mentally. 1.3.1 DOK 2 ❑ <u>Open Response</u> "Is It Worth It? Given the cost of babysitting for the first, second, and each additional hour, calculate the amount of money earned for a given time period. 1.3.1 DOK 2 ❑ <u>Open Response</u> "Dining Out" Given the cost for children and adults for lunch and dinner at a buffet restaurant, determine how much money a family of five would save by eating at the restaurant for lunch rather than dinner. 1.3.1 DOK 2

Grade 5 Math	Unit 2: Measurement		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
	<u>Program of Studies</u>		
1. How do I use	❑ *GM-4 use charts and tables to determine time*	❑ Length	❑ With a partner, measure each other's heights in "feet

Grade 5 Math	Unit 2: Measurement		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*

area, perimeter, and volume in my everyday life?
 	
2.   How can the mean, median, mode and range be used to analyze a given set of data?
 	
3.   How do I determine all possible outcomes for a given situation?
 	
4.   How are probability and statistics used in "real life"?
	schedules and work with time zones.
	❑ *GM-5 determine area and perimeter of triangles and rectangles.*
	❑ *GM-6 relate units (e.g., linear, volume, mass) within a measurement system (e.g., 125 cm = 1 m 25 cm).*
	
	<u>Core Content</u>
	
	❑ **MA-05-2.1.1 Students will apply standard units to measure length (to the nearest eighth-inch or the nearest centimeter) and to determine:**
	   ❑ **weight (ounce, pound; gram, kilogram);**
	   ❑ **perimeter;**
	   ❑ **area (figures that can divided into rectangular shapes);**
	   ❑ **time (nearest minute);**
	   ❑ **temperature (Fahrenheit and Celsius); and**
	   ❑ **angle measures (nearest degree). DOK 2**
	❑ MA-05-2.1.2 Students will choose and use appropriate tools (e.g., protractor, meter stick, ruler) for specific tasks and apply skills to solve real-world and mathematical problems.
	❑ MA-05-2.1.3 Students will use measurements to identify, describe, sort and compare attributes of objects and apply these to solve real-world and mathematical problems.
	❑ MA-05-2.1.4 Students will measure volume of rectangular prisms, liquid capacity and money using standard units and apply these skills to solve real-world and mathematical problems.
	❑ **MA-05-2.1.6 Students will estimate weight, length, perimeter, area, angle measures**
		❑ Area
		❑ Perimeter
		❑ Measure
		❑ Metric units
		❑ Customary units
		❑ Weight
			plus inches" form and "inches only" form and then show that the two measurements are equal. (**Lesson 47 Activity**) 2.2.2 DOK 2
			❑ With a partner, measure each other's heights in metric and customary units. Cut a matching length of adding machine tape and label it with both measures. Continue by measuring length and width of feet and hands, circumference of head and use this to determine diameter and radius. Make paper cutouts of each body part measured and label with measurements and attach to the measuring tape. "**Measuring Me**". 2.2.2 DOK 2
			❑ <u>Open response</u> "Science Museum" (create a schedule for the fifth grade field trip to the Science Museum given the time frame for the trip and exhibits at the museum).
			❑ <u>Open Response</u> "New School Floor" (given the dimensions of a classroom, determine the area of the room. Then compute the cost of new floor tiles, if each square foot tile costs $3.75. The school board has approved $3500 for the job. First estimate the cost and then calculate the actual cost and determine if the job can be done.) 2.1.1 DOK 3
			❑ After reviewing the units of mass and weight, choose 2 or 3 objects from the classroom to weigh; for example, a pencil or stapler. Pass the objects around the room and estimate the mass or weight of each object. Use the benchmarks from Master 26 to help estimate the mass or weight. Use the balance scale to verify the reasonableness of the estimate. Determine the best unit with which to measure mass or weight for a given list of objects (Master 27) (**Activity 15**) 2.1.2 DOK 2
			❑ <u>Open Response</u> "Patio" given that a garden patio is to be built containing 36 1-foot square tiles; create three different rectangular patios with an area of 36 square feet. Then determine how much railing would be need to enclose each patio (perimeter) and then identify the dimensions of the patio that would require the least amount of railing and explain in writing how you made your determination. 2.1.1 DOK 3

Grade 5 Math	Unit 2: Measurement		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
	and time using appropriate units of measurement. DOK 2 ❑ MA-05-2.2.2 Students will describe, define, give examples of and use to solve real-world and mathematical problems nonstandard and standard (U.S. Customary, metric) units of measurement. ❑ **MA-05-2.2.3 Students will convert units within the same measurement system [U.S. customary (inches, feet, yards, miles; ounces, pounds, tons), metric (millimeters, centimeters, meters, kilometers; grams, kilograms), money, or time] and use the units to solve problems. DOK 2**		

Grade 5 Math	Unit 3: Geometry		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
1. How do I classify 2D and 3D objects in my world? 2. How and why do I need to know how to measure objects and time in my world? 3. How can knowing how to graph and read ordered pairs be useful?	<u>**Program of Studies**</u> ❑ *GM-1 identify and model basic two-and three-dimensional shapes by appearance and in different orientations (i.e., turn models different ways).* ❑ *GM-2 measure and construct angles to the nearest degree.* ❑ GM-3 classify angles as acute, obtuse, or right. <u>**Core Content**</u> ❑ **MA-05-3.1.1 Students will describe and provide examples of basic geometric elements and terms [points, segments, lines (perpendicular, parallel, intersecting), rays, angles (acute, right, obtuse), sides, edges,**	❑ Angle ❑ Acute angle ❑ Obtuse angle ❑ Right angle ❑ Point ❑ Line ❑ Line segment ❑ Ray ❑ Parallel lines ❑ Perpendicular lines ❑ Intersecting lines ❑ Two-dimensional figures ❑ Triangle ❑ Right triangle ❑ Equilateral triangle ❑ Quadrilaterals	❑ Use their knee and elbow joints to demonstrate various angles; use a protractor to measure and draw angles. (**Investigation 4**) 3.1.1 DOK 2 ❑ In pairs, after listening to teacher read "Sir Cumference and the Round Table"; use a bottle of bubbles and construction paper to create soap bubble prints, which they will use to practice their measuring skills by finding the circumference, diameter, and radius of their circles**.** 3.1.1 DOK 2 ❑ Construct 2-D and 3-D figures using drinking straws and pipe cleaners. 3.1.2, 3.1.3 DOK 3 ❑ After studying a table place setting, identify as many geometry concepts that they can see by writing complete sentences and including appropriate math vocabulary. (**Place math)WP** 3.1.1 3.1.2 3.1.3 DOK 3 ❑ Use pattern blocks to demonstrate how a figure looks if it is flipped, slid, or turned by using pattern blocks.

Grade 5 Math	Unit 3: Geometry		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
	faces, bases, vertices, radius, diameter], and will apply these elements to solve real-world and mathematical problems. DOK 2 ❑ **MA-05-3.1.2 Students will describe and provide examples of basic two-dimensional shapes [circles, triangles (right, equilateral), all quadrilaterals, pentagons, hexagons, octagons], and will apply these shapes to solve real-world and mathematical problems. DOK 2** ❑ **MA-05-3.1.3 Students will describe and provide examples of basic three-dimensional shapes (spheres, cones, cylinders, pyramids, cubes, triangular and rectangular prisms), will identify three-dimensional objects from two-dimensional representations (nets) and will apply the attributes to solve real-world and mathematical problems. DOK 2** ❑ **MA-05-3.1.5 Students will identify and describe congruent figures in real-world and mathematical problems. DOK 2** ❑ **MA-05-3.2.1 Students will describe and provide examples of line symmetry in real-world and mathematical problems or will apply line symmetry to construct a geometric design. DOK 3** ❑ **MA-05-3.2.2 Students will identify or draw 90º rotations, reflections or translations of basic shapes within a plane. DOK 1** ❑ **MA-05-3.3.1 Students will identify and graph ordered pairs on a positive coordinate system scaled by ones, twos, threes, fives, or tens; locate points on a grid; and apply graphing in the coordinate system to solve real-world and mathematical problems. DOK 2**	❑ Pentagon ❑ Hexagon ❑ Octagon ❑ Circle ❑ Diameter ❑ Radius ❑ Congruent ❑ Similar ❑ Translation ❑ Reflections ❑ Rotations ❑ Three-dimensional figures ❑ Sides ❑ Edges ❑ Faces ❑ Vertices ❑ Spheres ❑ Cones ❑ Cylinders ❑ Pyramids ❑ Cubes ❑ Triangular prisms ❑ Rectangular prisms ❑ Symmetry ❑ Ordered pairs	"Exploring With Pattern Blocks" pgs. 32-35. 3.2.2 DOK 2 ❑ Investigate symmetry by folding a piece of construction paper in half lengthwise and then writing their name (in cursive) along the fold line with chalk. The bottom of each letter should touch the fold and all letters must be connected. Cut around the letters and then open up and glue to a contrasting piece of construction paper. "**Reflecting Yourself**" 3.2.1 DOK 3 ❑ Identify parallel and perpendicular line segments by creating the Roman Numerals from 1 to 10 with toothpicks; then complete a chart showing which numerals contain parallel or perpendicular line segments. "**Looking for Line Segments**". 3.1.1 DOK 2 ❑ As a class, review a list of different types of lines, angles, and polygons, create a list of examples of each that can be found in the classroom. Then discuss where they have seen examples of items in the list in the "real world", such as in nature, art, or architecture. Students then find examples of each listed item and are asked to find examples of those used in magazines, books, newspaper, or on the Internet and display them in the form of a poster. (**Activity 11 & 12**) 3.1.1 DOK 2 ❑ <u>Open Response</u> "To Be or Not To Be" given drawings of several figures, classify each as polygon or not a polygon, identify each polygon and explain why some of the figures are not polygons. 3.1.1 DOK 2 ❑ <u>Open Response</u> "Who Is Right?" Given examples of several angles, determine which ones are right angles and explain why the others are not right angles. 3.1.1 DOK 2 ❑ In small groups, design a "Geohouse" on graph paper using various 2D and 3D shapes, etc. After the design is complete, they will construct the house according to their "blueprint" using various items such as graham crackers and candies in various shapes. 3.1.2 3.1.3 DOK 2 ❑ <u>Open Response</u> "ABC Symmetry" use the alphabet to

Grade 5 Math	Unit 3: Geometry		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
			determine three letters that have only one line of symmetry, three letters that are not symmetrical, and one letter that has at least two line of symmetry. Draw chosen letters and show the lines of symmetry with dotted lines. 3.2.1 DOK 3 ❑ Identify & graph points on a coordinate plane. **Invest. 10** 3.3.1 DOK 2 ❑ <u>Open Response</u> "Neighborhood Friends" Given three different locations as possible locations for a club meeting (points on a coordinate graph), students will plot given points ordered pairs) for the locations of five friends homes, determine how far from each location that each student lives and then select the best location for their club meetings. They must justify why the location they chose is the best. 3.3.1 DOK 2

Grade 5 Math	Unit 4: Data Analysis and Probability		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
1. How do I decide which graph to use to display my data?	**<u>Program of Studies</u>** ❑ *PS-1 develop meaning and interpretation of arithmetic mean (average) for numerical data.* ❑ *PS-2 pose questions; collect, organize, display data; and choose an appropriate way to collect and represent data.* ❑ *PS-3 use counting techniques, tree diagrams, and tables to explore probability experiments.* ❑ *PS-4 explore how sample size affects the reliability of the outcome.* ❑ *PS-5 make predictions.* ❑ *PS-6 find mean, median, mode, and range for a set of data.* **<u>Core Content</u>**	❑ Range ❑ Mean (average) ❑ Median ❑ Mode ❑ Pictograph ❑ Line graph ❑ Line plot ❑ Bar graph ❑ Circle graph ❑ Data ❑ Interval ❑ Scale ❑ Tally tables ❑ Venn diagram ❑ Table ❑ Possible outcomes	❑ Use pictures to determine the total number of combinations for a given situation and make generalizations about determining all combinations for any situation. (**Activity 1 & 2**) 4.4.1 DOK 2 ❑ Use calculators to find the average (mean) of a set of data. (**Activity 9 & 10**) 4.2.1 DOK 2 ❑ Explore the concept of chance using different colored counters and a paper bag. (**"All's Fair In Love and Math")** 4.4.2 DOK 2 ❑ Make a prediction as to how many times a penny would land on heads if flipped 48 times. Conduct the experiment and record results in a chart and compare the results with the prediction. Collect results from 9 other students and make a line graph showing the results. ("**Heads Up**", <u>Hands on Math</u>) 4.4.2 DOK 2 ❑ Use software program "Graph Master" to create graphs

Grade 5 Math	Unit 4: Data Analysis and Probability		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
	□ **MA-05-4.1.1 Students will analyze and make inferences from data displays (drawings, tables/charts, tally tables, pictographs, bar graphs, circle graphs, line plots, Venn diagrams, line graphs). DOK 3** □ MA-05-4.1.2 Students will collect data (e.g., tallies, surveys) and explain how the skills apply in real-world and mathematical problems. □ **MA-05-4.1.3 Students will construct data displays (pictographs, bar graphs, line plots, line graphs, Venn diagrams, tables). DOK 2** □ **MA-05-4.2.1 Students will determine and apply the mean, median, mode (for a data set with no more than one mode) and range of a set of data. DOK 2** □ MA-05-4.3.1 Students will describe and give examples of the process of using data to answer questions (e.g., pose a question, plan, collect data, organize and display data, interpret data to answer questions). □ **MA-05-4.4.1 Students will determine all possible outcomes of an activity/event with up to 12 possible outcomes. DOK 2** □ **MA-05-4.4.2 Students will determine the likelihood of an event and the probability of an event (expressed as a fraction). DOK 2**	□ Prediction □ Conclusion □ Analyze □ Inferences □ Construct □ Probability	from various data collection activities. □ Explore combinations by having 5 students (three boys and two girls) go to the front of the room to demonstrate how many different combinations of boy/girl dancing partners can be formed. Students will make a list of the six combinations that can be found. Repeat the activity, if necessary, with a different number of students. Guide the students to see that they can multiply the number of elements in one set by the number of elements in the second set. "**How Many Can Dance With Me**?" 4.4.1 DOK 2 □ Create a Tree Diagram to determine the number of possible combinations given various lunch choices. "**What Can I Eat**" 4.4.1 DOK 2 □ Create a Tree Diagram to determine the number of possible combinations of ice cream cones given six flavors of ice cream and two varieties of cones. "**At The Ice-Cream Shoppe**" 4.4.1 DOK 2 □ Investigate probability using one of the following activities: (1) drop a paper cup from waist high to the floor and predict if it will land on its side, its bottom, or upside down. Try about 40-50 tests and record the results. Try the same test with a plastic cup and compare the results. (2) perform the same investigation as above, but use thumb tacks. Will the tack land so that its point is touching the floor or will it land with the point straight up? Which occurs most often? (3) use a pair of dice to answer probability questions based on the roll of one die or two dice. "**Roll 'em' **" 4.4.1 DOK 2 □ Decide with a partner, if a game played with three wooden craft sticks (red/green, red/blue, green/blue) is fair. One player must be "match" while the other player is "different". One student in each pair drops all three sticks simultaneously on a desktop. If two sticks show the same color, then "match" earns a point. If three different colors show, then "different" earns a point. Do this twenty times and keep a tally of the points. Then show the students a tree diagram with all the different combinations and discuss whether the game was fair.

Grade 5 Math	Unit 4: Data Analysis and Probability		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
			Have the students decide if they would want to switch "names" if they played the game again and explain why or why not (in writing). "**That's Not Fair**" 4.4.2 DOK 2
			❑ Determine the likelihood of certain events by deciding if a given event is certain, likely, or impossible. "**Certain, Impossible, or Somewhere in Between?"** 4.4.2 DOK 2
			❑ Do a class or school survey on topics of interest. Create appropriate graphs to represent the data. Show how the graphs are related by calculating the mean, median, and mode. 4.1.2 DOK 2
			❑ Predict the outcome of an event and test the predictions. "**Take a Spin**" 4.4.2 DOK 2
			❑ Read and interpret data presented on a bar graph. **(Activity 14)** 4.1.1 DOK 3
			❑ Interpret and display data in a bar graph, a pictograph, a circle graph, and a Venn diagram. **(Investigation 8)** 4.1.1 4.1.2 DOK 3
			❑ Interpret and create line graphs and double-line graphs. **(Investigation 9)** 4.1.1 4.1.2 DOK 3

Grade 5 Math	Unit 5: Algebraic Thinking		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
1. How can I use equations to solve problems involving real-world situations? 2. How and why can I use patterns to solve problems?	**Program of Studies** ❑ *A-1 create, recognize, extend, find, and write rules for number patterns.* ❑ *A-2 explore variables and solve equations using variables.* ❑ *A-3 generalize a rule for ordered pairs.* **Core Content** ❑ **MA-05-5.1.1 Students will extend patterns, find the missing term(s) in a pattern or**	❑ Variable ❑ Equation ❑ Input ❑ Output ❑ Function tables ❑ Patterns ❑ Sequence ❑ Inequalities	❑ Investigate patterns and functions by using beans to determine the rule (pattern) for function (input-output) ("**Function Beans**", <u>Hands on Math)</u>, 5.1.1 DOK 3 ❑ <u>Open Response</u> "Patterns" determine the pattern and then complete a chart giving number of laps two students walk around the school gymnasium each morning and then explain the patterns discovered. 5.1.1 DOK 3 ❑ Solve number sentences with variables for basic arithmetic skills. 5.3.1 DOK 2 ❑ Identify arithmetic sequences, continue the sequence,

Grade 5 Math	Unit 5: Algebraic Thinking		Suggested Length: Ongoing
Essential Questions	*Program of Studies* and Core Content	Key Terms and Vocabulary	Classroom Instruction and <u>Assessment</u> *Student will:*
	describe rules for patterns (numbers, pictures, tables, words) from real-world and mathematical problems. **DOK 3** ❑ **MA-05-5.1.2 Students will describe functions (input-output) through pictures, tables or words and will construct tables to analyze functions based on real-world or mathematical problems. DOK 2** ❑ **MA-5-5.1.3 Students will determine an output value or an input value for a function rule given the other value. DOK 2** ❑ **MA-05-5.2.1 Students will model verbal descriptions of real-world and mathematical problems using a variable or a missing value in an expression. DOK 2** ❑ **MA-05-5.3.1 Students will model real-world and mathematical problems with simple number sentences (equations and inequalities) with a variable or missing value (e.g., 4 = 2 x N, $\lceil\ \rceil$+5>14) and apply number sentences to solve mathematical and real-world problems. DOK 2**		and find the rule for a pattern between pairs of numbers and use the rule to find a missing number in a pair (input-output machines **Investigation 7**). 5.1.2 DOK 2 ❑ <u>Open Response</u> "Input-Output" Given three different input-output tables, find the rule (for each table) when the number *n* is put in and determine what number will come out; create and complete a table with your rule using the letter *n*. 5.1.2 DOK 2 ❑ <u>Open Response</u> "True or False" Given a number sentence containing a variable, list all the whole numbers that make the sentence true and all the whole numbers that make the sentence false; explain how you know. 5.3.1 DOK 2