

Utah Mathematics Core Matrix 2007
Granite School District

Kindergarten	1 st Grade	2 nd grade	3 rd grade	4th grade	5 th grade	6th grade
Standard I: Students will understand simple number concepts and relationships.	Standard I: Students will acquire number sense and perform simple operations with whole numbers.	Standard I: Students will acquire number sense with whole numbers and fractions and perform operations with whole numbers.	Standard I: Students will understand the base-ten numeration system, place value concepts, simple fractions, and perform operations with whole numbers.	Standard I: Students will acquire number sense and perform operations with whole numbers, simple fractions, and decimals.	Standard I: Students will expand number sense to include integers and perform operations with whole numbers, simple fractions and decimals.	Standard I: Students will expand number sense to include operations with rational numbers.
Objective 1: Identify and use whole numbers up to 30.	Objective 1: Represent and use whole numbers up to 100.	Objective 1: Identify and represent the relationships among numbers, quantities, and place value in whole numbers up to 1,000.	Objective 1: Represent whole numbers up to 10,000 comprehend place value concepts, and identify relationships among whole numbers using base-ten models and symbolic notation.	Objective 1: Demonstrate multiple ways to represent whole numbers and decimals; from hundredths to one million, and fractions.	Objective 1: Represent whole numbers and decimals from thousandths to one billion, fractions, percents, and integers.	Objective 1: Represent rational numbers in a variety of ways.
Objective 2: Identify and use simple relationships among whole numbers up to 30.	Objective 2: Identify simple relationships among whole numbers up to 100.	Objective 2: Use unit fractions to identify parts of the whole and parts of a set.	Objective 2: Use fractions to describe and compare parts of the whole.	Objective 2: Analyze relationships among whole numbers, commonly used fractions, and decimals to hundredths.	Objective 2: Explain relationships and equivalencies among integers, fractions, decimals, and percents.	Objective 2: Explain relationships and equivalencies among rational numbers.
Objective 3: Model, describe, and illustrate meanings of addition and subtraction for whole numbers less than ten.	Objective 3: Model, describe, and illustrate the meanings of addition and subtraction and use these operations to solve problems.	Objective 3: Estimate, model, illustrate, describe, and solve problems involving 2- and 3-digit addition and subtraction.	Objective 3: Model problems involving addition, subtraction, multiplication, and division.	Objective 3: Model and illustrate meanings of multiplication and division of whole numbers and the addition and subtraction of fractions.	Objective 3: Use number theory concepts to develop and use divisibility tests; classify whole numbers to 50 as prime, composite, or neither; and find common multiples and factors.	Objective 3: Use number theory concepts to find prime factorizations, least common multiples, and greatest common factors.
			Objective 4: Compute and solve problems involving addition and subtraction of 3- and 4-digit numbers and basic facts of multiplication and division.	Objective 4: Solve problems involving multiplication and division of whole numbers and addition and subtraction of simple fractions and decimals.	Objective 4: Model and illustrate meanings of multiplication and division.	Objective 4: Model and illustrate meanings of operations and describe how they relate.
						Objective 5: Solve problems involving multiple steps.

						Objective 6: Demonstrate proficiency with the four operations, with positive rational numbers and with addition and subtraction of integers.
1.a. Represent whole numbers (up to 30) using concrete, pictorial, and symbolic representations. Exploratory: Represent quantities using concrete objects and investigate partitioning of sets.	1.a. Count, read, and write whole numbers 1.b. Represent whole numbers (up to 100) using the number line, models, and the number sentences. 1.c. Represent whole numbers greater than 10 in groups of tens and ones using objects, pictures, and expanded notation.	1.a. Represent whole numbers in groups of hundreds, tens and ones using base ten models and write the numeral representing the set in standard and expanded form.	1.a. Read, write, and represent whole numbers using standard and expanded form.	1.a. Read and write numbers in standard and expanded form.	1.a.. Read and write numbers in standard and expanded form.	1.c. Write a whole number in expanded form using exponents. .
2.b. Compose and decompose quantities to establish a relationship between the parts and the whole. 2.c. Recognize 5 or 10 as a part of the part-whole relationship of numbers.	2.e. Represent part-whole relationships using the number line.	1.c. Represent the composition and decomposition of numbers in a variety of ways.	1.b. Demonstrate multiple ways to represent numbers using models and symbolic representations (e.g. fifty is the same as 2 groups of 25, the number of pennies in 5 dimes, or $75 - 25$).	1.b. Demonstrate multiple ways to represent whole numbers and decimals by using models and symbolic representations (e.g. 36 is the same as the square of 6, 3 dozen, or 9×4).	1.b. Demonstrate multiple ways to represent whole numbers, decimals, fractions, percents, and integers using models and symbolic representations (e.g. $108 = 2 \times 50 + 8$; $90\% = 90$ out of 100 squares on a hundred chart.	1.d. Express numbers in scientific notation using positive powers of ten.
1.c. Use one-to-one correspondence when counting a set of objects and develop a strategy for keeping track of counted and uncounted objects. Exploratory: Count by ones, beginning from any number in the counting sequence.	2.c. Identify 1 more, 1 less, 10 more, and 10 less than a given number. 2.d. Identify numbers missing from a counting sequence.	1.b. Identify the place and the value of a given digit in a 3-digit numeral.	1.c. Identify the place and the value of a given digit in a 4-digit numeral and round numbers to the nearest ten, hundred, and thousand.	1.c. Identify the place and the value of a given digit in a 6-digit numeral, including decimals to hundredths, and round to the nearest tenth.		
		1.e. Identify and describe even and odd whole numbers.				

<p>1.b. Order a set of up to 10 objects and use ordinal numbers from first to tenth to identify the position of the object in the chosen order.</p> <p>2.d. Compare sets of objects and determine whether they have the same, fewer, or more objects.</p>	<p>2.a. Compare and order sets of objects and numbers using the terms greater than, less than, and equal to when describing the comparisons.</p>	<p>1.d. Compare and order numbers using the terms, greater than, less than, or equal to, and the symbols, $>$, $<$, and $=$, using various strategies, including the number line.</p> <p>Exploratory: Investigate comparing fractions in terms of greater than, less than, and equal to.</p>	<p>1.d. Order and compare whole numbers on a number line and use the symbols $<$, $>$, $=$ and not equal when comparing whole numbers.</p> <p>2.d. Place fractions on the number line and compare and order fractions using models, pictures, the number line, and symbols.</p>	<p>2.b. Order whole numbers up to 6 digits, simple fractions, and decimals using a variety of methods (e.g. number line, fraction pieces) and use the symbols $<$, $>$, $=$ to record the relationships.</p> <p>2.a. Compare the relative size of numbers (e.g., 475 is comparable to 500, 475 is small compared to 10,000 but large compared to 98)</p> <p>2.c. Identify a number that is between two given numbers (e.g. 3.2 is between 3 and 4, find a number between 0.1 and 0.2)</p>	<p>2.a. Compare fractions by finding a common denominator.</p> <p>2.b. Order integers, fractions, (including mixed numbers), and decimals using a variety of methods, including the number line.</p> <p>1.c. Identify, read, and locate fractions, mixed numbers, decimals, and integers on the number line.</p>	<p>2.a. Place rational numbers on a number line.</p> <p>2.b. Compare and order rational numbers, including positive and negative mixed fractions and decimals, using a variety of methods and symbols, including the number line and finding common denominators.</p>
<p>3.a. Demonstrate the joining and separating of sets of objects to solve problems.</p> <p>3.b. Describe the joining or separating of sets with informal language when using models.</p> <p>3.c. Record pictorially the results from joining or separating of sets.</p>	<p>3.a. Use a variety of models, including objects, length-based models, the number line and the ten-frame to describe problem types (i.e. part-whole, combine separate, compare)</p> <p>3.b. Use the properties of addition (i.e. commutativity, associativity, identity element) and the mathematical relationship between addition and subtraction to solve problems.</p> <p>3.c. Compute basic addition facts up to 10 + 10) and the related subtraction facts using strategies (e.g. $6 + 7 = (6 + 4) + 3 = 10 + 3 = 13$)</p> <p>3.d. Find the sum of 3 one-digit numbers.</p>	<p>3.a. Demonstrate quick recall of addition facts (up to $10 + 10$) and related subtraction facts.</p> <p>3.b. Model addition and subtraction of 2- and 3-digit whole numbers (sums and minuends to 1000) in a variety of ways.</p> <p>3.d. Demonstrate fluency of 2- and 3-digit addition and subtraction problems, using efficient, accurate, and generalizable strategies that include standard algorithms and mental arithmetic, and describe why the procedures work.</p> <p>3.e. Use the mathematical relationship between addition and subtraction</p>	<p>4.b. Find the sum or difference of 3- and 4-digit numbers, including monetary amounts, using models and strategies such as expanded form, compensation, partial sums, and the standard algorithm.</p>			

	Exploratory: Develop and use strategies for addition and subtraction of multi-digit whole numbers.	and properties of addition to model and solve problems.				
				Exploratory: Explore numbers less than zero by extending the number line and by using familiar applications such as temperature.	1.e. Describe situations where integers could be used in the students' environment. Exploratory: Explore adding and subtracting integers.	2.e. Recognize that the sum of an integer and its additive inverse is zero.
			1.e. Identify factors and multiples of whole numbers.	3.b. Use rectangular arrays to interpret factoring (e.g. find all rectangular arrays of 36 tiles and relate the dimensions of the arrays to factors of 36).	3.a. Identify patterns with skip counting and multiples to develop and use divisibility tests for determining whether a whole number is divisible by 2, 3, 5, 6, 9, and 10. Exploratory: Apply rules of divisibility. 3.b. Use strategies for classifying whole numbers to 50 as prime, composite, or neither. Exploratory: Extend classification of whole numbers from 0 – 100 as prime, composite, or neither. 3.c. Rewrite a composite number between 2 and 50 as a product of only prime numbers. 3.d. Find common multiples and factors and apply to adding and subtracting fractions.	3.a. Determine whether whole numbers to 100 are prime, composite, or neither. 3.b. Find the prime factorization of composite numbers. 3.c. Find the greatest common factor and least common multiple for two numbers using a variety of methods (e.g. list of multiples, prime factorization)
				1.f. Identify and represent square numbers using models and symbols.	1.d. Represent repeated factors using exponents.	1.b. Change whole numbers with exponents to standard form and recognize that any non-zero whole

						number to the zero power equals 1.
	<p>Exploratory: Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.</p> <p>Exploratory: Use concrete materials to investigate situations that lead to multiplication and division.</p>	<p>4.a. Represent multiplication with equal groups using concrete objects and skip counting by 2s, 5s, and 10s.</p> <p>Exploratory: Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.</p>	<p>3.a. Demonstrate the meaning of multiplication and division of whole numbers through the use of a variety of representations (e.g. equal sized groups, arrays, area models, and equal jumps on a number line for multiplication, partitioning and sharing for division).</p> <p>3.b. Use a variety of strategies and tools, such as repeated addition or subtraction, equal jumps on a number line, and counters arranged in arrays to model multiplication and division problems.</p>	<p>3.a. Model multiplication (e.g. equal sized groups, rectangular arrays, area models, equal intervals on the number line), place value, and the properties of operations to represent multiplication of a 1- or 2- digit factor by a 2- digit factor and connect the representation to an algorithm.</p>		
			<p>3.c. Demonstrate, using objects that multiplication and division by the same number are inverse operations (e.g. $3 \times n = 12$ is the same as 12 divided by 3 = n, and $n = 4$</p>	<p>3.c. Demonstrate the mathematical relationship between multiplication and division (e.g. $3 \times n = 12$ is the same as 12 divided by 3 = n, and $n = 4$</p>		
			<p>4.b. Compute basic multiplication facts (0-10) and related division facts using a variety of strategies based on properties of addition and multiplication (i.e. commutative, associative, identity, zero and the distributive properties).</p>	<p>5.a. Demonstrate a quick recall of basic multiplication and division facts.</p>		

			3.d. Demonstrate the effect of place value when multiplying whole numbers by 10.		4.b. Demonstrate the effect of place value when multiplying and dividing whole numbers by 10, 100, and 1,000.	
			Exploratory: Extend multiplication and division to larger-digit numbers. Exploratory: Investigate the distributive property of multiplication over addition for single-digit multipliers (e.g. 7×25 is equivalent to $7 \times (10 + 5)$ is equivalent to $(7 \times 10) + (7 \times 5)$)	5.b. Multiply up to a 3-digit factor by a 2-digit factor with fluency and using efficient procedures.	6.a. Multiply multi-digit whole numbers by a 2-digit whole number with fluency using efficient procedures.	6.a. Multiply and divide a multi-digit number by a 2-digit number, including decimals. Exploratory: Investigate the distributive property of multiplication over addition of double-digit multipliers.
Exploratory: ...investigate partitioning of sets.	Exploratory: Understand situations that entail multiplication and division such as equal groupings of objects and sharing equally. Exploratory: Use concrete materials to investigate situations that lead to multiplication and division.	4.b. Represent division as fair shares using concrete objects or pictures. Exploratory: Understand situations that entail multiplication and division such as equal groupings of objects and sharing equally.	3.a. Demonstrate the meaning of multiplication and division of whole numbers through the use of a variety of representations (e.g. ...partitioning and sharing for division) 3.b. Use a variety of strategies and tools, such as repeated addition or subtraction, equal jumps on a number line, and counters arranged in arrays to model multiplication and division problems. Exploratory: Extend multiplication and division to larger-digit numbers.	3.d. Represent division of a 3-digit dividend by 1-digit divisor, including whole number remainders, using a variety of methods (e.g. rectangular arrays, manipulatives, pictures) and connect the representation to an algorithm. 5.c. Divide up to a 3-digit dividend by a 1-digit divisor with fluency, using efficient procedures.	4.a. Represent division with remainders using whole numbers, decimals, or fractions. 5.d. Interpret division with remainder problems as they apply to the environment (e.g. If there were 53 people, how many vans are needed if each van holds 8 people?) 6.b. Divide multi-digit dividends by a 1-digit divisor with fluency, using efficient procedures. Exploratory: Divide multi-digit dividends by a 2-digit divisor.	4.c. Give mixed number and decimal solutions to division problems with whole numbers. 6.a. Multiply and divide a multi-digit number by a 2-digit number, including decimals.
2.a. Estimate quantities in a set of objects using multiples of 10 as benchmark numbers.	2.b. Make reasonable estimates of the quantitative difference between two sets of objects.	3.d. ...include mental arithmetic...	4.a. Use a variety of methods to facilitate computation (e.g. estimation, mental math strategies, paper and pencil).	4.a. Use estimation, mental math, paper pencil and calculators to perform mathematical calculations and identify when to use	5.a. Determine when it is appropriate to use estimation, mental math strategies, paper-and-pencil, and algorithms. 5.b. Make reasonable estimations of fraction	5.b. Use estimation to determine whether results obtained using a calculator are reasonable. 5.c. Use estimation or calculation to compute

				each one appropriately. 4.b. Select appropriate methods to solve a single operation problem and estimate computational results or calculate them directly, depending on the context and numbers involved in a problem.	and decimal sums, differences, and products, including knowing whether results obtained using a calculator are reasonable.	results, depending on the context and numbers involved to the problem.
			1.c...round numbers to the nearest ten, hundred, and thousand	1.c...round numbers to the nearest tenth.		
Exploratory: Create problems that can be solved using addition and subtraction.	II.2.d. Create problem situations from given number sentences involving addition and subtraction. II.2.c. Write and solve number sentences from problem situations involving addition and subtraction	3.c. Write a story problem that relates to a given addition or subtraction equation, and write a number sentence to solve a story problem hat is related to the environment.	3.e. Write a story problem that relates to a given addition, subtraction, or multiplication equation, and write a number sentence to solve a problem related to the students' environment.	4.c. Write a story problem that relates to a given multiplication or division equation, and select and write a number sentence to solve a problem related to the environment.	5.c. Write number sentences that can be used to solve a two-step problem.	
			2.a. Identify the denominator of a fraction as the number of equal parts of the unit and the numerator of a fraction as the number of equal parts being considered.			
	Exploratory: Investigate the meaning of fraction concepts.	2.a. Divide geometric shapes into 2, 3, or 4 equal parts and identify the parts as halves, thirds, or fourths. 2.b. Divide sets of objects into 2, 3, or 4 parts of equal number of objects and identify the parts as halves, thirds, or fourths. 2.c. Represent the unit fractions $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{4}$ with objects, pictures, words (e.g., ___ out of ___ equal parts), and symbols.	2.b. Define regions and sets of objects as the whole and divide the whole into equal parts using a variety of objects, models, and illustrations. 2.c. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, sixths, and eighths.	1.d. Divide regions, lengths, and sets of objects into equal parts using a variety of models and illustrations. 1.e. Name and write a fraction to represent a portion of a unit whole, length or set for halves, thirds, fourths, fifths, sixths, eighths, and tenths.	2.c. Rewrite mixed numbers and improper fractions from one form to the other and represent each using regions, sets of objects, or line segments.	

			2.e. Find equivalent fractions using concrete and pictorial representations.	2.d. Identify equivalent fractions and decimals by connecting models to symbols. 3.e. Generate equivalent fractions and simplify fractions using models, pictures, and symbols.	2.c. Model and calculate equivalent forms of a fraction (including simplest form). 2.d. Represent commonly used fractions as decimals and percents in a variety of ways (e.g. models, fraction strips, pictures, calculators, algorithms).	2.c. Find equivalent forms for common fractions, decimals, percents, and ratios, including repeating and terminating decimals. 2.d. Relate percents less than 1% or greater than 100% to equivalent fractions, decimals, whole numbers, and mixed numbers.
		Exploratory: Investigate addition of common fractions (e.g. $\frac{1}{2} + \frac{1}{2} = 1$, $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$)	Exploratory: Use concrete objects and visual models to add and subtract common decimals.	3.e. Use models to add and subtract simple fractions where one single digit denominator is 1, 2, or 3 times the other (e.g. $\frac{2}{4} - \frac{1}{4}$; $\frac{3}{4} - \frac{1}{8}$) Exploratory: Use concrete objects and visual models to add and subtract common decimals. 5.d. Add and subtract decimals and simple fractions where one single-digit denominator is 1, 2, or 3 times the other. e.g. $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$; $\frac{1}{3} - \frac{1}{6} = \frac{1}{6}$	6.d. Add and subtract fractions with fluency. 5.c. Add and subtract decimals with fluency and using efficient procedures.	6.b. Add, subtract, multiply, and divide fractions and mixed numbers. Exploratory: Explore the addition and subtraction of positive and negative fractions.
					4.c. Model multiplication of fractions and decimals (e.g. tenths multiplied by tenths, a whole number multiplied by tenths, or a whole number with tenths multiplied by tenths) in a variety of ways (e.g. manipulatives, number line and area models, patterns). 6.e. Multiply fractions.	4.a. Relate fractions to multiplication and division and use this relationship to explain procedures for multiplying and dividing fractions. 6.b. ...multiply and divide fractions and

				Exploratory: Investigate the concept of ratio (e.g. the number of students to the number of teachers).	Exploratory – Algebra. Construct and analyze tables involving equivalent ratios.	mixed numbers. 1.a. Recognize a rational number as a ratio of two integers, a to b, where b is not equal to zero. Exploratory: Investigate the concepts of ratio and proportion. 5.b. Recognize that ratios derive from pairs of rows in the multiplication table and connect with equivalent fractions. 5.d. Solve problems involving ratios and proportions. Exploratory – Algebra. Model situations with proportional relationships and solve problems.
				4.d. Solve problems involving simple fractions and interpret the meaning of the solution (e.g. A pie has been divided into 6 pieces and 1 piece is already gone. How much of the whole pie is there when Mary comes in? If Mary takes 2 pieces, how much of the whole pie has she taken? How much of the pie is left)		5.a. Select appropriate methods to solve a multi-step problem involving multiplication and division of fractions and decimals.
Vocabulary: add, subtract, first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, same, fewer, more, estimate	Vocabulary: sum, difference, greater than, less than, equal to, number line, expanded form	Vocabulary: >, <, =, expanded form, standard form, even, odd, fractions, halves, thirds, fourths, 1/2, 1/3, 1/4	Vocabulary: factor, product, array, multiple, numerator, denominator, equivalent, estimate, sixths, eighths, divisor, dividend, quotient	Vocabulary: square number, order of operations, simplest form, decimals	Vocabulary: prime, composite, exponent, common denominator, common factor, common multiple, percents, divisible, divisibility, integer, simplest terms, various symbols for multiplication and	Vocabulary: least common multiple, least common denominator, greatest common factor

					division, mixed numeral, improper fraction	
Standard II: Students will sort and classify objects as well as recognize and create simple patterns.	Standard II: Students will identify and use number patterns and properties to described and represent mathematical relationships.	Standard II: Students will model, represent, and interpret patterns and number relationships to create and solve problems with addition and subtraction.	Standard II: Students will use patterns, symbols, operations, and properties of addition and multiplication to represent and describe simple number relationships.	Standard II: Students will use patterns and relations to represent mathematical problems and number relationships.	Standard II: Students will use patterns and relations to analyze mathematical problems and number relationships using algebraic symbols.	Standard II: Students will use patterns, relations, and algebraic expressions to represent and analyze mathematical problems and number relationships.
Objective 1: Identify, sort, and classify objects according to common attributes.	Objective 1: Recognize, describe, and represent patterns with more than one attribute.	Objective 1: Recognize, describe, create, and extend growing patterns.	Objective 1: Create, represent, and analyze growing patterns.	Objective 1: Identify, analyze, and determine rules for describing numerical patterns involving operations and nonnumerical growing patterns.	Objective 1: Identify, analyze and determine a rule for predicting and extending numerical patterns involving operations, whole numbers, decimals, and fractions.	Objective 1: Analyze algebraic expressions, tables, and graphs to determine patterns, relations, and rules.
Objective 2: Identify, duplicate, and extend simple repeating and growing patterns.	Objective 2: Recognize and represent mathematical relationships using symbols and use number sentences with operational symbols to solve problems.	Objective 2: Model, represent, and interpret number relationships using mathematical symbols.	Objective 2: Recognize, represent, and simplify simple number relationships using symbols, operations, and properties.	Objective 2: Use algebraic expressions, symbols, and properties of the operations to represent, simplify, and solve mathematical equations and inequalities.	Objective 2: Use algebraic expressions, inequalities, or equations to represent and solve simple real-world problems.	Objective 2: Write, interpret, and use mathematical expressions, equations, and formulas to represent and solve problems that correspond to given situations.
1.a. Sort objects into groups by attribute and identify which attribute was used. 1.b. Describe multiple ways to sort and classify a group of objects.	1.a. Sort and classify objects using more than one attribute.					
2.a. Identify and describe simple repeating patterns with numbers and shapes. 2.b. Duplicate and extend simple repeating patterns with numbers and shapes. 2.c. Describe simple growing patterns with shapes. 2.d. Identify simple patterns in the environment.	1.b. Identify, create, and label repeating patterns using objects, pictures, and symbolic notation. 1.c. Identify, create, and label growing patterns using objects, pictures, and symbolic notation. 1.d. Use patterns to establish skip counting by 2s, 5s, and 10s.	1.a. Determine the next term in linear patterns (e.g. 2, 4, 6...; the number of hands on one person, 2 people, 3 people) 1.b. Construct models that skip count by 2s, 3s, 5s, and 10s and relate to repeated addition.	1.a. Create and extend growing patterns using objects, numbers, and tables. 1.b. Describe how patterns are extended using manipulatives, pictures, and numerical representations.	1.a. Analyze growing patterns using objects, pictures, numbers, and tables to determine a rule for the pattern. 1.b. Recognize represent, and extend simple patterns involving multiples and other number patterns (e.g. square numbers) using objects, pictures,	1.a. Analyze and make predictions about numeric patterns, including decimals and fractions. 1.b. Determine a rule for the pattern using organized lists, tables, objects, and variables.	1.a. Describe simple relationships by creating and analyzing tables, equations, and expressions. 1.b. Draw a graph and write an equation from a table of values. 1.c. Draw a graph and create a table of values from an equation.

	<p>Exploratory: Explore skip counting by 5s, 10s, and 2s.</p>			<p>numbers, and tables. 1.c. Identify simple relationships in real-life context and use mathematical operations to describe the pattern (e.g. the number of legs on a given number of chairs may be determined by counting by fours or by multiplying the number of chairs by 4).</p>		
	<p>2.c. Write and solve number sentences from problem situations involving addition and subtraction, using symbolic notation for the missing value (e.g. $* + 4 = 7$) 2.a. Recognize that “=” indicates that the two sides of an equation are expressions of the same number. 2.b. Recognize that “+” indicates the joining of sets and that “-“ indicates the separation of sets.</p>	<p>2.a. Recognize that the “not equal” sign indicates a relationship in which the two sides of the inequality are expressions of different numbers.</p>	<p>2.a. Represent numerical relationships as expressions, equations, and inequalities. Exploratory: Use concrete materials to build an understanding of equality, and inequality. 2.b. Solve equations involving equivalent expressions (e.g. $6 + 4 = _ + 7$). 2.c. Use the $>$, $<$, and $=$ symbols to compare two expressions involving addition and subtraction (e.g. $4 + 6 _ 3 + 2$; $3 + 5 _ 16 - 9$). Exploratory. Explore properties of equality in number sentences (e.g. when equals are added to equals, then the sums are equal; when equals are multiplied by equals, then the products are equal).</p>	<p>2.b. Express single-operation problem situations as equations and solve the equation. Exploratory. Use concrete materials to build an understanding of equality and inequality. 2.a. Use the order of operations to evaluate, simplify, and compare mathematical expressions involving four operations, parentheses, and the symbols $<$, $>$, and $=$ (e.g. $2 \times (4 - 1) + 3$; of the two quantities $7 - (3 - 2)$ or $(7 - 3) - 2$ which is greater? Exploratory. Explore properties of equality in number sentences (e.g. when equals are added to equals, then the sums are equal, when equals are multiplied by equals, then the products are equal).</p>	<p>2.b. Use patterns, models, and relationships as contexts for writing and solving simple equations and inequalities with whole number solutions (e.g. $6x = 54$; $x + 3 = 7$) 2.a. Use properties and order of operations involving addition, subtraction, multiplication, division, and the use of parentheses to compute with whole numbers, decimals, and fractions. Exploratory. Solve multi-step equations.</p>	<p>2.a. Solve single variable linear equations using a variety of strategies. 2.b. Recognize that expressions in different forms can be equivalent and rewrite an expression to represent a quantity in a different way.</p>

	Exploratory: Investigate situations with variables as unknowns and as quantities that vary.	2.b. Recognize that symbols such as x , triangle, or rhombus in an addition or subtraction equation represent a number that will make the statement true. Exploratory: Investigate situations with variables as unknowns and as quantities that vary.		2.c. Recognize that a symbol represent the same number through an equation or expression (e.g. $n + n = 8$, thus $n = 4$)		2.c. Evaluate and simplify expressions and formulas substituting given values for the variables (e.g. $2x + 4$; $x = 2$; therefore, $2(2) + 4 = 8$). Exploratory. Use physical models to investigate and describe how a change in one variable affects a second variable. Exploratory: Use models to develop understanding of slope as constant rate of change.
		2.c. Use the commutative and associative properties of addition to simplify calculations.	2.d. Recognize and use the commutative, associative, distributive, and identity properties of addition and multiplication, and the zero property of multiplication.	2.d. Describe and use the commutative, associative, distributive, and identity properties of addition and multiplication, and the zero property of multiplication.		
Vocabulary: sort, repeating patterns, growing patterns, attribute	Vocabulary: skip count, number sentence, symbol, $+$, x , $=$	Vocabulary: “not equal” sign, commutative and associative property of addition	Vocabulary: expressions, equations, $>$, $<$, $=$, distributive and identity properties, zero property of multiplication	Vocabulary: order of operations, commutative property, associative property distributive property of addition and multiplication, variable, parentheses, inequality	Vocabulary: variety of symbols for multiplication and division, such as $x \cdot$ for multiplication, and a fraction bar as a division symbol,	Vocabulary: sequence, function, algebraic expression, approximately equal, notation for exponents, a number in front of a variable indicates multiplication (e.g. $3x$ means 3 times the quantity x), formula, generalization
III. Students will understand basic geometry concepts.	III. Students will understand simple geometry concepts...	III. Students will understand simple geometry concepts...	III. Students will describe and analyze attributes of two-dimensional shapes	III. Students will understand attributes and properties of plane geometric objects and spatial relationships.	III. Students will use spatial reasoning to recognize, describe, and analyze geometric shapes and principles.	III. Students will use spatial reasoning to recognize, describe, and analyze geometric shapes and principles.
Objective 1: Identify and create simple geometric shapes and describe simple spatial relationships.	Objective 1: Identify, describe, and create simple geometric figures.	Objective 1: Describe, classify, and create geometric figures.	Objective 1: Describe and compare attributes of two-dimensional shapes.	Objective 1: Identify and describe attributes of two-dimensional geometric shapes.	Objective 1: Describe relationships between 2- and 3-dimensional shapes and analyze attributes and properties	Objective 1: Identify and analyze attributes and properties of geometric shapes to solve problems.

					of geometric shapes.	
			Objective 2: Demonstrate the meaning of congruence through applying transformations.	Objective 2: Specify locations using grids and maps.	Objective 2: Specify locations on a coordinate plane.	Objective 2: Visualize and identify geometric shapes after applying transformations on a coordinate plane.
				Objective 3: Visualize and identify geometric shapes after applying transformations.		
			Exploratory: Explore line symmetry and rotational symmetry.	1.a. Name and describe lines that are parallel, perpendicular, and intersecting. 1.c. Identify and describe the radius and diameter of a circle. 1.d. Identify and describe figures that have line symmetry and rotational symmetry.	1.a. Draw, label, and describe line segments, rays, lines, parallel lines, and perpendicular lines.	1.a. Identify the midpoint of a line segment and the center and circumference of a circle.
1.a. Identify, name, describe, and draw circles, triangles, rectangles, and squares in various sizes and orientations. 1.d. Investigate 2- and 3-dimensional shapes including hexagons, trapezoids, spheres, cubes, and cones. 1.b. Combine shapes to create 2-dimensional objects (e.g. using a triangle and square to create a picture of a house)	1.a. Name, create, and sort geometric plane figures (i.e. circle, triangle, rectangle, square, trapezoid, rhombus, parallelogram, hexagon). 1.b. Identify, geometric plane and solid figures (i.e. circle, triangle, rectangle, square, trapezoid, hexagon, rhombus, parallelogram, cube, sphere, cone) in the students' environment. 1.c. Compose and decompose plane and solid figures (e.g. make 2 triangles from a square) and describe the part-whole relationships, the attributes of the figures, and how they are different and similar.	1.a. Describe and classify plane and solid geometric figures (i.e. circle, triangle, rectangle, square, trapezoid, rhombus, parallelogram, pentagon, hexagon...) according to the number of sides and angles... 1.b. Compose and decompose shapes and figures by substituting arrangements of smaller shapes for larger shapes or substituting larger shapes for arrangements of smaller shapes. 1.c. Compose and decompose shapes and figures and describe the part-whole relationships similarities, and differences.	1.a. Identify describe, and classify polygons (e.g. pentagons, hexagons, octagons). 1.b. Identify attributes for classifying triangles (e.g. two equal sides for the isosceles triangle, 3 equal sides for the equilateral triangle, right angle for the right triangle). 1.c. Identify attributes for classifying quadrilaterals (e.g. parallel sides for the parallelogram, right angles for the rectangle, equal sides and right angles for the square.)		1.c. Classify triangles and quadrilaterals and analyze the relationships among the shapes in each classification (e.g. a square is a rectangle). Exploratory: Compare corresponding angles of two triangles to determine whether the triangles are similar.	Exploratory: Use manipulatives and technology to model geometric shapes. Exploratory: Investigate tessellations.

			<p>1.d. Identify right angles in geometric figures, or in appropriate objects, and determine whether other angles are greater or less than a right angle.</p>	<p>1.d. Identify and describe right, acute, obtuse, and straight angles. IV.1.d. Recognize that angles are measured in degrees and develop benchmark angles (e.g., 45, 60, 120 degrees), using 90 degree angles to estimate angle measurement. 3.b. Recognize that 90, 180, 270, and 360 degrees are associated with $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ and full turns. IV.1.e. Measure angles using a protractor or angle ruler.</p>	<p>1.b. Draw, label, and define an angle as two rays sharing a common endpoint (vertex)</p>	<p>1.b. Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms. 1.c. Develop and use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle in a triangle or quadrilateral. Exploratory: Explore the angles formed by intersecting lines.</p>
<p>1.d. Investigate 2- and 3-dimensional shapes including hexagons, trapezoids, spheres, cubes, and cones.</p>	<p>1.b. Identify geometric plane and solid figures (i.e. ...sphere, cone) in students' environment 1.c. Compose and decompose plane and solid figures and describe the part-whole relationships, the attributes of the figures, and how they are different and similar.</p>	<p>1.c. Describe and classify plane and solid geometric figures (i.e....cube, sphere, cone) according to the number offaces, edges, and vertices)</p>	<p>Exploratory: Investigate two-dimensional representations of three-dimensional objects.</p>	<p>Exploratory: Investigate two-dimensional representations of three-dimensional objects</p>	<p>1.d. Relate pyramids and right prisms to the 2-Dimensional shapes (nets) from which they were created. 1.e. Identify properties and attributes of solids (i.e. right prisms, pyramids, cylinders, cones) and describe them by the number of edges, faces, and vertices as well as the types of faces.</p>	<p>Exploratory: Identify and draw shapes and figures from different view/perspectives.</p>
			<p>2.a. Demonstrate the effect of reflection, translation, or rotation using objects. 2.b. Determine whether two polygons are congruent by reflecting, translating, or rotating one polygon to physically fit on top of the other.</p>	<p>3.a. Identify a translation, rotation, or a reflection of a geometric shape. Exploratory: Analyze results of transformations (e.g. translations, rotations, reflections) on two-dimensional objects.</p>	<p>Exploratory: Rotate a shape around a fixed point and identify the location of the new vertices. Exploratory: Translate a polygon either horizontally or vertically on a coordinate grid and identify the location of the new vertices.</p>	<p>2.a. Rotate a polygon about the origin by a multiple of 90 degrees and identify the location of the new vertices. 2.b. Translate a polygon horizontally or vertically on a coordinate grid and identify the location of the new vertices. 2.c. Reflect a polygon across either the x- or</p>

					Exploratory: Reflect a shape across either the x- or y-axis and identify the location of the new axis.	y-axis and identify the location of the new vertices.
I.c. Use words to describe position and distance.		Exploratory: Use verbal instructions to move within the environment.		2.a. Locate coordinates in the first quadrant of a coordinate grid. 2.b. Give the coordinates in the first quadrant of a coordinate grid. 2.c. Locate regions on a map of Utah. 2.d. Give the regions of a position on a map of Utah.	2.a. Locate points defined by ordered pairs of integers. 2.b. Write an ordered pair for a point in a coordinate plane with integer coordinates. 2.c. Specify possible paths between locations on a coordinate plane and compare distances of the various paths.	2.b. Translate a polygon horizontally or vertically on a coordinate grid and identify the location of the new vertices. 2.c. Reflect a polygon across either the x- or y-axis and identify the location of the new vertices.
Vocabulary: circle, triangle, rectangle, hexagon, trapezoid, sphere, cube, cone, square, shorter, longer, above below, near, far, between	Vocabulary: trapezoid, hexagon, rhombus, parallelogram, cube, sphere, cone, compose, decompose	Vocabulary: pentagon, hexagon, vertices, vertex, angle, face, edge	Vocabulary: polygon, attribute, quadrilateral, equilateral triangle, isosceles triangle, right triangle, octagon, parallel, right angle, reflect, translate, rotate, slide, flip, turn, congruent, transformation	Vocabulary: perpendicular, intersecting lines, acute angle, obtuse angle, straight angle, radius, diameter, line and rotational symmetry, coordinate, grid, first quadrant, degree, transformation	Vocabulary: rays, scalene triangle, acute triangle, obtuse triangle, Corresponding angles, similar, pyramid, right prism, line segments, x- and y-axis	Vocabulary: midpoint, circumference, complementary and supplementary angles, tessellations, perspective
III. Students will understand basic measurement concepts.	III. Students will understand simple measurement concepts.	III. Students will understand simple measurement concepts.	IV. Students will select and use appropriate units and measurement tools to solve problems.	IV. Students will describe relationships among units of measure, use appropriate measurement tools, and use formulas to find area measurements.	IV. Students will determine area of polygons and surface area and volume of three-dimensional shapes.	IV. Students will understand and apply measurement tools and techniques and find the circumference and area of a circle.
Objective 1: Identify and use measurable attributes of objects and units of measurements.	Objective 1: Identify measurable attributes of objects and units of measurement, and use appropriate techniques and tools to determine measurements.	Objective 1: Identify and use units of measurement, iterate (repeat) that unit, and compare the number of iterations to the item being measured.	Objective 1: Select and use appropriate tools and units to estimate and measure length, weight, capacity, time, and perimeter of two-dimensional figures.	Objective 1: Describe relationships among units of measure for length, capacity, and weight, and determine measurements of angles using appropriate tools.	Objective 1: Determine the area of polygons and apply to real-world problems.	Objective 1: Describe and find the circumference and area of a circle.
			Objective 2: Solve problems involving measurements.	Objective 2: Recognize and describe area as a measurable attribute of two dimensional shapes and calculate area measurements.	Objective 2: Recognize, describe, and determine surface area and volume of three-dimensional shapes.	Objective 2: Identify and describe measurable attributes of objects and units of measurement, and solve problems involving

<p>2.d. Compare two objects by measurable attributes (i.e. length, weight) and order several objects by measurable attributes (i.e. length, weight)</p>	<p>Exploratory: Compare objects using non-standard units.</p>	<p>Exploratory: Determine simple equivalencies of measurement.</p>	<p>1.a. Describe the part-whole relationships (e.g. 3 feet in a yard, a foot is 1/3 of a yard) between metric units of length (i.e. centimeter, meter), and among customary units of length (i.e. inch, foot, yard), capacity (i.e. cup, quart), and weight (i.e. pound, ounce) 2.a. Determine simple equivalencies of measurements (e.g. 30 inches = 2 feet and 6 inches, 6 cups = 1 ½ quarts; 90 min = 1 hr. 30 min.). 2.b. Compare given objects according to measurable attributes (i.e. length, weight, capacity).</p>	<p>1.a. Describe the relative size among metric units of length (i.e. millimeter, centimeter, meter), between metric units of capacity (i.e. milliliter, liter), and between metric units of weight (i.e. gram, kilogram). 1.b. Describe the relative size among customary units of capacity (i.e. cup, pint, quart, gallon).</p>		<p>measurement.</p> <p>2.b. Convert units of measurement within the metric system and convert units of measurement within the customary system.</p> <p>2.c. Compare a meter to a yard, a liter to a quart, and a kilometer to a mile.</p>
<p>Exploratory: Measure objects using non-standard units.</p>	<p>2.a. Identify the appropriate tools for measuring length, weight, capacity, temperature, and time. 2.b. Measure the length of an object using nonstandard units using groups of tens and ones.</p>	<p>2.a. Identify and use measurement units to measure, to the nearest unit, length (i.e. inch, centimeter), weight in pounds, and capacity in cups). 2.b. Estimate and measure length by iterating a nonstandard or standard unit of measure. 2.c. Use different units to measure the length of the same object and recognize that the smaller the unit, the more iterations needed to cover a given length.</p>	<p>1.b. Measure the length of objects to the nearest centimeter, meter, half-and quarter-inch, foot and yard. 1.c. Measure capacity using cups and quarts, and measure weight using pounds and ounces.</p>	<p>1.c. Estimate and measure capacity using milliliters, liters, cups, pints, quarts, and gallons, and measure weight using grams and kilograms.</p>		<p>2.a. Recognize that measurements are approximations and describe how the size of the unit used in measuring affects the precision. 2.d. Determine when it is appropriate to estimate or use precise measurement when solving problems.</p>
			<p>1.e. Describe perimeter as a measurable attribute of two-dimensional figures,</p>	<p>Exploratory: Investigate perimeter of rectangles and squares.</p>		<p>1.a. Explore the relationship between the radius and diameter of a circle to the circle's</p>

			<p>and estimate and measure perimeter with metric and customary units.</p> <p>2.c. Solve problems involving perimeter.</p>	<p>2.f. Determine possible perimeters in whole units, for a rectangle with a fixed area, and determine possible areas when given a rectangle with a fixed perimeter</p>	<p>Exploratory: Investigate pi as the ratio of the circumference to the diameter of a circle.</p>	<p>circumference to develop the formula for circumference.</p> <p>1.b. Find the circumference of a circle using a formula.</p> <p>1.c. Describe pi as the ratio of the circumference to the diameter of a circle.</p>
				<p>2.a. Quantify area by finding the total number of same-sized units of area needed to fill the region without gaps or overlaps.</p> <p>2.b. Recognize that a square is 1 unit on a side is the standard unit for measuring area.</p> <p>2.c. Develop the area formula for a rectangle and connect it with the area model for multiplication.</p> <p>2.d. Develop and use the area formula for a right triangle by comparing with the formula for a rectangle (e.g. two of the same right triangles make a rectangle).</p> <p>2.e. Develop, use, and justify relationships among area formulas of triangles and parallelograms by decomposing and comparing with areas of right triangles and rectangles.</p> <p>Exploratory: Investigate area of trapezoids.</p>	<p>1.c. Compare areas of polygons using different units of measure within the same measurement system (e.g. square feet, square yards)</p> <p>1.a. Determine the area of a trapezoid by the composition and decomposition of rectangles, triangles, and parallelograms.</p> <p>1.b. Determine the area of irregular and regular polygons by the composition and decomposition of rectangles, triangles, and parallelograms.</p> <p>2.d. Relate the formulas</p>	<p>1.d. Decompose a circle into a number of wedges and rearrange the wedges into a shape that approximates a parallelogram to develop the formula for the area of a circle.</p> <p>1.e. Find the area of a circle using a formula.</p>

					<p>for the areas of triangles, rectangles, or parallelograms to the surface area of a right prism.</p> <p>2.c. Derive and use the formula to determine the surface area of a right prism and express the surface area in square units.</p>	<p>2.e. Derive and use the formula to determine the surface area and volume of a cylinder.</p> <p>Exploratory: Investigate volumes and surface areas of a variety of 3-D objects.</p>
					<p>2.a. Quantify volume by finding the total number of same-sized units of volume needed to fill the space without gaps or overlaps.</p> <p>2.b. Recognize that a cube having a 1 unit edge is the standard unit for measuring volume expressed as a cubic unit.</p> <p>c. Derive and use the formula to determine the volume of a right prism with a triangular or rectangular base.</p> <p>Exploratory: Determine the volume of a right prism with various bases.</p>	<p>2.e. Derive and use the formula to determine the surface area and volume of 3-D objects.</p> <p>Exploratory: Investigate volume and surface areas of a variety of 3-D objects.</p>
<p>2.a. Identify clocks and calendars as tools that measure time.</p> <p>2.b. Identify a day, week, and month on a calendar and name the days of the week in order.</p>	<p>2.d. Tell time to the hour and half-hour.</p> <p>2.e. Name the months of the year and seasons in order, and use a calendar to determine the day of the week and date.</p>	<p>2.e. Tell time to the quarter-hour and sequence a series of daily events by time (e.g. breakfast at 7:00 a.m., schools begins at 9:00 a.m. schools ends at 3:00 p.m.).</p>	<p>2.d. Determine elapsed time in hours (e.g. 7:00 a.m. to 2:00 p.m.)</p>			
<p>2.c. Identify pennies, nickels, dimes, and quarters as units of money.</p> <p>Exploratory: Identify the value of a penny, nickel,</p>	<p>1.c. Identify the value of a penny, nickel, dime, quarter, and dollar, and determine the value of a set of the same coins that total 25</p>	<p>2.d. Determine the value of a set of up to 5 coins that total \$1.00 or less (e.g. 3 dimes, 1 nickel, and 1 penny = 36 cents).</p>	<p>Exploratory: Determine the value of a combination of coins and bills.</p> <p>Exploratory: Count back change from a</p>			

dime and quarter.	cents or less (e.g. a set of 5 nickels = 25 cents).		single purchase.			
Vocabulary: Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, penny, nickel, dime, quarter, measure	Vocabulary: dollar, January, February, March, April, May, June, July, August, September, October, November, December, winter, spring, summer, fall, half hour	Vocabulary: inch, centimeter, pound, cup, weight, length, capacity, iterations, iterating, quarter hour	Vocabulary: measure, unit, metric system, customary system, length, pound, ounce, meter, foot, yard, quarter inch, quart, equivalencies, elapsed time, perimeter.	Vocabulary: millimeter, milliliter, liter, gram, kilogram, pint, quart, gallon, area, formula	Vocabulary: volume, surface area, right prism	Vocabulary: cylinder, radius, diameter, circumference, pi, convert, mile
III. Students will collect and organize data.	III. Students will collect, represent, and draw conclusions from data.	III. Students will collect, represent, and draw conclusions from data.	V. Students will collect and organize data to make predictions and identify basic concepts of probability.	V. Students will interpret and organize collected data to make predictions, answer questions, and describe basic concepts of probability.	V. Students will construct, analyze, and construct reasonable conclusions from data and apply basic concepts of probability.	V. Students analyze, draw conclusions, and make predictions based upon data and apply basic concepts of probability.
Objective 3: Collect and organize simple data.	Objective 3: Collect, organize, and represent simple data.	Objective 3: Collect, record, organize, display, and interpret numerical data.	Objective 1: Collect, organize, and display data to make predictions.	Objective 1: Collect, organize, and display data to answer questions.	Objective 1: Formulate and answer questions using statistical methods to compare data, and propose and justify inferences based on data.	Objective 1: Design investigations to reach conclusions using statistical methods to make inferences based on data.
			Objective 2: Identify basic concepts of probability.	Objective 2: Describe and predict simple random outcomes.	Objective 2: Apply basic concepts of probability.	Objective 2: Apply basic concepts of probability and justify outcomes.
3.a. Pose questions and gather data about self and surroundings. 3.b. Organize data obtained from sorting and classifying objects. Exploratory: Organize data in lists, tables, and simple graphs.	3.a. Collect and represent data using tables, tally marks, pictographs, and bar graphs. 3.b. Describe and interpret data. Exploratory: Interpret data from charts and graphs.	3.a. Collect and record data systematically, using a strategy for keeping track of what has been counted. 3.b. Organize and represent the same data in more than one way. 3.c. Organize, display, and label information, including keys, using pictographs, tallies, bar graphs, and organized tables. 3.d. Describe data represented on charts and graphs and answer simple questions related to data representations.	1.a. Collect, read, represent, and interpret data using tables, graphs, and charts, including keys (e.g. pictographs, bar graphs, frequency tables, line plots). 1.b. Make predictions based on a data display.	1.a. Identify a question that can be answered by collecting data. 1.b. Collect, read, and interpret data from tables, graphs, charts, surveys, and observations. 1.c. Represent data using frequency tables, bar graphs, line plots, and stem and leaf plots. 1.d. Identify and distinguish between clusters and outliers of a data set. Exploratory: Explore minimum and	1.a. Construct, analyze, and display data using an appropriate format (e.g. line plots, bar graphs, line graphs). 1.b. Recognize the differences in representing categorical and numerical data. Exploratory: Explore the differences in representing categorical and numerical data. 1.c. Identify minimum and maximum values	1.a. Design investigations to answer questions. 1.b. Extend data display and comparisons to include scatter plots and circle graphs. 1.c. Compare two similar sets of data on the same graph and compare two graphs representing the same set of data. 1.d. Recognize that changing the scale influences the appearance of a display of data. 1.e. Propose and justify

				maximum values for a set of data. Exploratory: Explore mean, median, mode, and range.	for a set of data. 1.d. Identify and calculate the mean, median, mode, and range.	inferences and predictions based on data.
		Exploratory: Conduct simple probability experiments.	2.a. Describe the results of events using the terms “certain,” “likely,” “unlikely,” and “impossible.” 2.b. Conduct simple probability experiments, record possible outcomes systematically, and display results in an organized way (e.g. chart, graph). 2.c. Use results of simple probability experiments to describe the likelihood of a specific outcome in the future. Exploratory: Predict outcomes of simple experiments.	2.a. Describe the results of experiments involving random outcomes as simple ratios (e.g. 4 out of 9, 4/9). 2.b. Conduct simple probability experiments, with and without replacement, record possible outcomes systematically, and display results in an organized way. 2.c. Use the results of simple probability experiments, with and without replacement, to describe the likelihood of a specific outcome in the future.	2.a. Describe the results of experiments involving random outcomes using a variety of notations (e.g. 4 out of 9, 4/9). 2.b. Recognize that probability is always a value between 0 and 1 (inclusively). 2.c. Express the likelihood of an outcome in a simple experiment as a value between 0 and 1 (inclusively).	2.a. Write the results of a probability experiment as a fraction between 0 and 1, or an equivalent percent. 2.b. Compare experimental results with theoretical results (e.g. experimental: 7 out of 10 tails; whereas, theoretical 5 out of 10 tails). c. Compare individual, small group, and large group results of a probability experiment in order to more accurately estimate the actual probabilities. Exploratory: Investigate the notion of fairness in games.
Vocabulary: data	Vocabulary: value, tally marks, pictograph, bar graph, tables	Vocabulary: keys, probability	Vocabulary: chart, frequency table, line plot, likely, unlikely, certain, outcome, impossible outcome, predict	Vocabulary: stem and leaf plot, cluster, outlier, probability, surveys, with and without replacement	Vocabulary: minimum values, maximum values, mean, median, mode, average, range, line graph	Vocabulary: data display, scatter plot, circle graph, scale, justify, experimental results, theoretical results.