Mandan Public Schools
"WHERE THE BEST BEGIN"

Instructional Support Tools for Mandan Public Schools based on North Dakota State Standards for Mathematics

Mathematics (2014-15)

What is the purpose of this document?

This document is designed to help Mandan Public Schools (MPS) educators apply the North Dakota Mathematics Standards. The most recent North Dakota standards were adopted in 2011 and are based on the Common Core State Standards. The contents of this document have been aligned to these standards and are designed to guide MPS instructors in their work with students. It is intended to facilitate student learning by ensuring educators, students, and parents understand specifically what the content standards mean. This is expressed in terms of "I Can" statements that reflect what it is the students must know, understand, and be able to do within each standard.

What is in the document?

Each grade level is accompanied by a set of "I Can" statements that are organized based on the grade level, class and domains contained with the Common Core State Standards. The domains help to organize the standards according to common topics within Mathematics. They allow for vertical alignment of the content. "I Can" statements are intended to answer a simple question "What does this standard mean that a student must know and be able to do?" and to ensure that the description is helpful, specific, and comprehensive for educators. Additionally, contained within the document is an explanation of the Mathematical Practices, which are those practices all educators should strive to develop within their students.

The Mathematical Practices

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report. Adding It Up: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices.

In this respect, those content standards, which set an expectation of understanding, are potential "points of intersection" between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

Kindergarten

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester 1	Trimester 2	Trimester 3
		Counting and Cardinallity(CC)		***1***	***2***	***3***
K	K.CC.1	Count to 100 by ones and by tens.	1) I can count to 100 by ones.	x	x	x
			2) I can count to 100 by tens.		x	x
K	K.CC.2	Count forward beginnning from a given number within the known sequence(instead of beginning at 1.)	I can count starting with any number.		x	x
K	K.CC.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	1) I can write the numbers from 0 to 20.	x	x	
			2) I can write the numeral for the number of objects I counted.	x	x	x
K	K.CC.4	Understand the relationship between numbers and quantities; connect counting to cardinality.				
		a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.	I can say the number as I count each object.	x	x	x
		b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.	I can understand the last number I said is the total number of objects I counted.	x	x	x
		c. Understand that each successive number name refers to a quantity that is one larger.	I can understand that each number name is one more than the last number name.	x	x	x
K	K.CC.5	Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.	I can count objects to answer questions.	x	x	x
K	K.CC.6	Identify whether the number of jobjectsd in one group is greater than, less than, or equal to the nubmer of objects in anothere group, EG., by using matching and counting strategies.	I can compare groups of objects to decide which is greater than, less than or equal to.		x	x
K	K.CC.7	Compare two numbers between 1 and 10 presented as written numerals.	I can compare two written numerals to decide which is greater than, less than, or equal to.		x	x
		Operations and Algebraic Thinking(OA)		***1***	***2***	***3***
K	K.OA.1	Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	1) I can show addition.		x	x
			2) I can show subtraction.		x	x
K	K.OA.2	Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	1) I can add to solve word problems.		x	x
			2) I can subtract to solve word problems.		x	x
K	K.OA.3	Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	I can break apart numbers into pairs in many ways.		x	x
K	K.OA.4	For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.	I can use objects and drawings to add a number to another number to make 10.		x	x
			I can make combinations of 10 using two numbers.		x	x
			I can show what number is needed to add to another number to make 10.			x
K	K.OA.5	Fluently add and subtract within 5.	I can quickly add numbers up to 5.		x	x
			I can quickly subtract from numbers up to 5.		x	x
		Number and Operations in Base Ten(NBT)		***1***	***2***	***3***
K	K.NBT.1	Compose and decompose numbers from 11 to 19 into ten ones and some further ones by using objects, drawings, and record each composition by a drawing or equation.	I can show how the numbers 11-19 are made of ten ones and more ones.		x	x
		Measurement and Data(MD)		***1***	***2***	***3***
K	K.MD.1	Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	I can describe objects.	x	x	x
K	K.MD.2	Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.	I can compare two objects.	x	x	x
K	K.MD.3	Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	I can sort and count objects.	x	x	x
		Geometry(G)		***1***	***2***	***3***
K	K.G.1	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to	I can describe objects around me by their shape and where they are found.	x	x	x
K	K.G.2	Correctly name shapes regardless of their orientations or overall size	I can name shapes.	x	x	x
K	K.G.3	Correctly name shapes regardless of their orientations or overall size	I can tell if a shape is flat or solid.		x	x
K	K.G.4	Analyze and compare a variety of two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners")and other attributes (e.g., having sides of equal length).	I can describe how shapes are alike and different.		x	x
K	K.G.5	Model shapes in the world by building shapes from components and drawing shapes.	I can build and draw shapes.	x	x	x
K	K.G.6	Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"	I can put shapes togetehr to make another shape.		x	x

First Grade

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester 1	Trimester 2	Trimester 3
		Operations and Algebraic Thinking(OA)		***1***	***2***	***3***
1	1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	I can solve addition and subtraction word problems.	x	x	x
1	1.OA.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	I can add three numbers to solve word problems.			x
1	1.OA.3	Apply properties of operations as strategies to add and subtract. Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known.(Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)	I can add numbers in any order and get the same answer.	x	x	x
1	1.OA.4	Understand subtraction as an unknown-addend problem. For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.	I can use addition to help me solve subtraction problems		x	x
1	1.OA.5	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	I can count to add and subtract.	x	x	x
1	1.OA.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten; decomposing a number leading to a ten; using the relationship between addition and subtraction ; and creating equivalent but easier or known sums.	I can add and subtract numbers to 20.		x	x

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
1	1.OA.8	Determine the unknown whole number in an addition or subtraction equations relating to three whole numbers.	I can solve equation with missing numbers.	x	x	x
		Number and Operations in Base Ten(NBT)		***1***	***2***	***3***
1	1.NBT.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	1)I can start at any number and count to 120.	x		
			2) I can read and write numerals to 120.		x	x
			3) I can write the numeral for the number of objects I counted.	x		
1	1.NBT.2	Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following cases:	1) I can explain two digit numbers using tens and ones.		x	x
		a. 10 can be thought of as a bundle of ten and ones- called a 'ten'.	2)I can bundle ones into groups of ten.		x	x
		b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.	3) I can explain how the numbers 11-19 are made of ten ones and more ones.		x	x
1	1.NBT.3	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.	I can compare two-digit numbers using symbols.	x	x	x
1	1.NBT.4	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; realte the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	I can show and explain how to add one-digit and two-digit numbers up to 100.		x	x
1	1.NBT.5	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.	1) I can find ten more or ten less than a number in my head.		x	x
			2) I can explain how I found ten more or 10 less than a number.		x	x
		Measurement and Data(MD)		***1***	***2***	***3***
1	1.MD.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.	I can put three objects in order by length.			x
1	1.MD.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.	I can use an object to measure the length of another object.			x
1	1.MD.3	Tell and write time in hours and half-hours using analog and digital clocks.	1) I can tell time to the nearest half hour.		x	x
			2) I can write time to the nearest half hour.		x	x
1	1.MD.4	Organize, represent, and interpret data with up to three categories, ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	1) I can create a graph or table.	x	x	
			2) I can ask and answer questions about graphs or tables.	x	x	
		Geometry(G)		***1***	***2***	***3***
1	1.G.1	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	1) I can tell the difference between attributes that make a shape a shape and those that do not.		x	
			2) I can build and draw shapes.		x	
1	1.G.2	Compose two-dimensional shapes to create a composite shape, and compose new shapes from the composite shape.	I can put shapes together to make other shapes.		x	
1	1.G.3	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.	1) I can divide circles and rectangles into equal parts.		x	
			2) I can describe equal parts as a part of a whole.		x	

Second Grade

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
		Operations and Algebraic Thinking(OA)		***1***	***2***	***3***
2	2.OA.1	Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	I can add to solve word problems.	x		
			I can subtract to solve problems		x	x
2	2.OA.2	Fluently add and subtract within 20 using mental strategies. By end of grade 2, know from memory all sums of two one-digit numbers.	1) I can fluently add within 20 in my head.	x		
			2) I can fluently subtract within 20 in my head.		x	x
			2) I can recall basic math facts from memory.	x	x	x
2	2.OA.3	Determine whether a group of objects (up to 20) has an odd or even number of members, eg., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	I can tell whether a group of objects is odd or even.	x	x	x
2	2.OA.4	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.	1) I can use addition to find the total of an array.			x
			2) I can write an equation that represents an array.			x
		Number and Operations in Base Ten(NBT)		***1***	***2***	***3***
2	2.NBT.1	Understand that the three digits of a three-digit number represents amounts of hundreds, tens, and ones.	1) I can explain three-digit numbers using hundereds, tens and ones.	x	x	x
		a. 100 can be thourgh of as a bundle of ten tens - called a 'hundered'.	2) I can explain 100 is a bundle of ten tens.	x	x	x
		b. The numbers 100, 200, 300 refer to one, two three hundreds	3) I can explain how many hundreds are in mutliples of 100.			x
2	2.NBT.2	Count within 1000; skip count by 5s, 10s, and 100s. 12:14	1) I can skip-count by 5's within a 1000.		x	x
			2) I can skip-count by 10's within a 1000.		x	x
			3) I can skip-count by 100's within a 1000.		x	x
2	2.NBT.3	Read and rewrite numbers to 1000 using base-ten numerals, number names, and expanded form.	I can read numbers to 1000.			x
2	2.NBT.4	Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.	I can compare two three-digit numbers.			x
2	2.NBT.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	I can fluently add and subtract within 100 using my understanding of place value and the properties of addition and subtraction.		x	x
2	2.NBT.7	Add and subtract within 1000, using concrete models or draw ings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.	1) I can add within 1000 using strategies I can explain.		x	x
			2) I can subtract within 1000 using strategies I can explain.		x	x
			3) I can relate addition strategies to written methods.	x		
			4) I can relate subtraction strategies to written methods.		x	x
2	2.NBT.8	Mentally add 10 or 100 to a given number 100-900 and mentally subtract 10 or 100 from a given number 100-900.	1) I can add 10 to a given number in my head.	x	x	x
			2) I can add 100 to a given number in my head.	x	x	x
			3) I can subtract 10 from a given number in my head.		x	x
			4) I can subtract 100 from a given number in my head.		x	x

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
2	2.NBT.9	Explain why addition and subtraction strategies work, using place value and the properties of operations.	1) I can explain why addition strategies work.	x	x	x
			2) I can explain why subtraction strategies work.		x	x
		Measurement and Data(MD)				
2	2.MD.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.	1) I can select appropriate tools for measuring length.			x
			2) I can measure the length of objects using different length units.			x
2	2.MD.2	Measure the length of an object twice, using the length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.	1) I can measure the length of objects using different length units.			x
			2) I can describe the relationship of different length units.			x
2	2.MD.3	Estimate lengths using units of inches, feet, centimeters, and meters.	1) I can estimate lengths using inches and feet.			x
			2) I can estimate lengths using centimeters and meters.			x
2	2.MD.6	Represent w hole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, …, and represent whole-number sums and differences within 100 on a number line diagram.	1) I can add using a number line.	x	x	x
			2) I can subtract using a number line.		x	x
2	2.MD.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	1) I can tell time to the nearest five minutes.			x
			2) I can write time to the nearest five minutes.			x
2	2.MD.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*	1) I can solve word problems involving money.			x
			2) I can use the $ and ¢ symbols.			x
2	2.MD.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	1) I can draw a picture graph.		x	x
			2) I can draw a bar graph.		x	x
			3)I can solve problems using a bar graph.		x	x
		Geometry(G)				
2	2.G.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.	1) I can identify shapes based on their attributes.		x	x
			2) I can draw shapes based on their attributes.		x	x
2	2.G.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.	I can partition a rectangle into rows and columns of same-size squares and count the total number.		x	x
2	2.G.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.	1) I can divide circles and rectangles into equal parts.		x	x
			2) I can describe equal parts as part of a whole		x	x
			3) I can recognize equal shares of identical shapes do not have to be the same shape.		x	x

Third Grade

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
		Operations and Algebraic Thinking(OA)		***1***	***2***	***3***
3	3.OA.1	Interpret products of whole numbers.	I can explain the meaning of the product.	x		
3	3.OA.2	Interpret whole-number quotients of whole numbers.	I can explain the meaning of the quotient.	x		
3	3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	I can solve multiplication word problems within 100 involving equal groups, arrays, and measurement quantities.	x		
			I can solve division word problems within 100 involving equal groups, arrays, and measurement quantitites.	x		
3	3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers.	I can find the unknown whole number (variable) in a multiplication equation.	x		
			I can find the unknown whole number (variable) in a division equation.	x		
3	3.OA.5	Apply properties of operations as strategies to multiply and divide.(commutative, associative and distributive properties)	I can use the commutative, associative and distributive properties to multiple and divide.	x		
3	3.OA.6	Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	I can use multiplication to find the answer to a division problem.	x		
3	3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.	I can fluently multiply and divide within 100 using strategies and properties.	x		
			I can fluently recall my multiplication facts 0-9.	x		
3	3.OA.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding	I can use any of the four operations to solve two-step word problems.	x		
			I can represent the problem using an equation with a letter for the unknown.	x		
			I can use mental math, estimation, rounding to decide if my answer makes sense.	x		
3	3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends*.	I can find arithmetic(number) patterns in the addition and multiplication tables.	x		
			I can explain these patterns.	x		
		Number and Operations in Base Ten(NBT)		***1***	***2***	***3***
3	3.NBT.1	Use place value understanding to round whole numbers to the nearest 10 or 100.	I can round whole numbers to the nearest 10 or 100.	x		
3	3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	I can add within a 1000.	x		
			I can subtract within a 1000.	x		
3	3.NBT.3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	I can multiply one-digit whole numbers by multiples of 10.	x		
		Number and Operations - Fractions(NF)		***1***	***2***	***3***
3	3.NF.1	Understand a fraction 1/*b* as the quantity formed by 1 part when *a*whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by a parts of size 1/*b*.	I can explain and show that a fraction is a part of a whole.		x	
			I can explain and show the meaning of the numerator and denominator.		x	
3	3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.	I can represent and explain where a fraction is on a number line.		x	
		b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	I can place fractions on a number line that is divided into intervals.		x	
		Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.				

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
3	3.NF.3	a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	I can show two fractions as equivalent if they are the same size or if they are on the same point on a number line.		x	
		b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.	I can recognize and show simple equivalent fractions.		x	
		d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	I can compare two fractions with the same numerator or the same denominator using <, >, or =.		x	
		Measurement and Data(MD)		***1***	***2***	***3***
3	3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	I can tell time to the nearest minute.		x	
			I can solve word problemns using addition and subtraction of time in minutes.		x	
3	3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	I can estimate and measure liquid volumes using liters.			x
			I can solve one-step word problems involving volume.			x
			I can estimate and measure masses of objects using grams and kilograms.			x
			I can solve one-step word problems involving mass.			x
3	3.MD.3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	I can draw a scaled picture graph.			x
			I can solve one and two-step problems using the picture graph.			x
			I can draw a scaled bar graph.			x
			I can solve one and two-step problems using the bar graph.			x
3	3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	I can measure and record lengths to the nearest half and fourth of an inch.			x
3	3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement.	I can find the area of a plane figure.			x
		a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.	I can use square units to measure area.			x
		b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.	I can label area with square units.			x
3	3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	I can measure area by counting square units.			x
3	3.MD.7	Relate area to the operations of multiplication and addition.				
		a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	I can find the area of a rectangle with tiles and show the area can be found by multiplying the side lengths.			x
		b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.	I can solve real-world math problems that involve area.			x
	3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	I can solve real-world problems involving perimeter and area.			x
		Geometry(G)		***1***	***2***	***3***
3	3.G.1	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	I can classify shapes by their attributes.			x
			I can draw a shape that does not belong to a group according to the attributes.			x
3	3.G.2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.	I can divide shapes into equal areas.			x

Fourth Grade

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
		Operations and Algebraic Thinking(OA)		***1***	***2***	***3***
4	4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	I can explain how a multiplication equation can be used to compare.		x	
4	4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	I can multiply or divide to solve word problems that use multiplication to compare.		x	
4	4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	I can solve multistep word problems using the four operations.		x	
			I can interpret the meanings of remainders.		x	
			I can represent problems using equations with a letter standing for the unknown quantity (variable).		x	
			I can decide if my answer makes sense using mental math, estimation, and rounding.		x	
4	4.OA.4	Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	I can find factor pairs for whole numbers 1-100.		x	
			I can recognize a whole number as a multiple of each of its factors.		x	
			I can decide whether a whole number (1-100) is a multiple of a given one-digit number.		x	
			I can determine if a whole number (1-100) is prime or composite.		x	
4	4.OA.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	I can create a number or shape pattern that follows a given rule.		x	
			I can identify characteristics about the pattern that are not part of the rule.		x	
		Number and Operations in Base Ten(NBT)		***1***	***2***	***3***
4	4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	I can read multi-digit whole numbers using numerals, number names, and expanded form.	x		
			I can write multi-digit whole numbers using numerals, number names, and expanded form.	x		

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
			I can compare two multi-digit numbers using >, <, and =.	x		
4	4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.	I can round multi-digit whole numbers to any place.	x		
4	4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	I can fluently add multi-digit numbers.	x		
			I can fluently subtract multi-digit numbers.	x		
4	4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	I can multiply a four digit whole number by a one digit whole number using strategies and properties of operations.	x		
			I can multiply two two-digit numbers using strategies and properties of operations.	x		
			I can represent the calculation using an equation, rectangular array, and/or area models.	x		
			I can explain the calculation using an equation, rectangular array, and/or area models.	x		
4	4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	I can divide up to a four digit whole number by a one digit whole number.		x	
			I can represent the calculation using an equation, rectangular array, and/or area models.		x	
			I can explain the calculation using an equation, rectangular array, and/or area models.		x	
		Number and Operations - Fractions(NF)		***1***	***2***	***3***
4	4.NF.1	Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	I can explain why fractions are equivalent using fraction models.		x	
			I can recognize and create equivalent fractions.		x	
4	4.NF.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	I can compare two fractions with different numerators and denominators using <, >, and =.		x	
			I can show the comparison using a fraction model from the same whole.		x	
			I can prove my comparisons using a fraction model.		x	
4	4.NF.3	Understand a fraction a/b with a > 1 as a sum of fractions 1/b.				
		a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	I can add fractions.		x	
			I can subtract fractions.		x	
		b. ecompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.	I can break apart a fraction into a sum of fractions with the same denominator in more than one way.		x	
			I can record each sum of fractions using an equation.		x	
			I can prove my equation using a fraction model.		x	
		c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	I can add mixed numbers with like denominators.		x	
			I can subtract mixed numbers with like denominators.		x	
		d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	I can solve word problems using addition of fractions with the same denominator.		x	
			I can solve word problems using subtraction of fractions with the same denominator.		x	
4	4.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.				
		a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).	I can use a visual fraction model to show that fractions have multiples.		x	
		b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)	I can use a fraction model to multiply a fraction by a whole number.		x	
		c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?	I can use fraction models to solve word problems involving multiplication of a fraction by a whole number.		x	
4	4.NF.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.2 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.	I can make an equivalent fraction for tenths as hundredths.		x	
			I can make an equivalent fraction for tenths as hundredths, therefore I can add fractions for tenths and hundredths.		x	
4	4.NF.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.	I can use decimal notation for fractions with denominators 10 or 100.			x
4	4.NF.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	I can compare two decimals to hundredths according to their size using <, >, =.			x
			I can show the comparison when the two decimals are from the same whole.			x
			I can prove the results using a visual model.			x
		Measurement and Data(MD)		***1***	***2***	***3***
4	4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...	I can determine the relative sizes of measurement within one system of units.			x
			I can express measurements in a larger unit in terms of a smaller unit.			x
			I can record the measurement equivalents in a two-column table.			x
4	4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	I can use the four operations to solve word problems including distance, time, volume, mass, and money.			x
			I can express measurements in a larger unit in terms of smaller units using simple factions or decimals.			x
			I can represent measurement quantities using diagrams such as a number line diagram.			x
4	4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	I can use the area and perimeter formulas in real world and math problems.			x
4	4.MD.4	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the	I can make a line plot using fractional units.			x

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
4	4.MD.4	information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.	I can use the line plot information to solve problems by adding and subtracting fractions.			x
4	4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:				
		a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.	I can use degrees to measure angles.			x
		b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees.	I can read the degree of an angle.			x
4	4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	I can use a protractor to construct and measure angles.			x
4	4.MD.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	I can recognize the sum of the angle parts is equal to the whole angle.			
			I can solve addition and subtraction problems with unknown angles on a diagram.			
		Geometry(G)		***1***	***2***	***3***
4	4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	I can draw geometric lines and angles.			x
			I can identify lines and angles in two-dimensional figures.			x
4	4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	I can classify two-dimensional figures based on parallel or perpendicular lines and angle size.			x
			I can recognize and identify right triangles.			x
4	4.G.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	I can recognize a line of symmetry.			x
			I can identify a figure with a line of symmetry.			x
			I can draw a line of symmetry.			x

Fifth Grade

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
		Operations and Algebraic Thinking(OA)		***1***	***2***	***3***
5	5.OA.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	I can evaluate algebraic expressions using symbols.	x		
5	5.OA.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.	I can write simple numerical expressions.	x		
			I can explain simple numerical expressions without finding the answer.	x		
5	5.OA.3	Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	I can create a function table (input/output).			x
			I can explain the rule.			x
			I can graph the ordered pairs.			x
			I can explain my graph.			x
		Number and Operations in Base Ten(NBT)		***1***	***2***	***3***
5	5.NBT.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	I can determine that a digit represents ten times what it would be in the place to its right and one-tenth to its left.	x		
5	5.NBT.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	I can explain the powers of ten.	x		
			I can explain the pattern in placement of a decimal point using a power of ten.	x		
5	5.NBT.3	Read, write, and compare decimals to thousandths.				
		a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).	I can read decimals to thousandths using numerals, number names, and expanded form.	x		
			I can write decimals to thousandths using numerals, number names, and expanded form.	x		
		b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	I can compare two decimals to thousandths using <, > and =.	x		
5	5.NBT.4	Use place value understanding to round decimals to any place.	I can round decimals to any place.	x		
5	5.NBT.5	Fluently multiply multi-digit whole numbers using the standard algorithm.	I can multiply multi-digit of whole numbers.	x		
5	5.NBT.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	I can divide four digit whole numbers by two digit whole numbers.	x		
			I can show the results of divison using equations models.	x		
			I can explain the results of divison using equations models.	x		
5	5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	I can add, subtract, multiply, and divide decimals to the hundredths using various methods.	x		
			I can explain how the answer was found.	x		
		Number and Operations - Fractions(NF)		***1***	***2***	***3***
5	5.NF.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	I can use equivalent fractions to add fractions with unlike denominators.		x	
			I can use equivalent fractions to subtract fractions with unlike denominators.		x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
5	5.NF.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.	I can solve word problems involving addition and subtraction of fractions including unlike denominators.		x	
			I can use benchmark fractions and number sense to estimate.		x	
			I can check for the reasonableness of my answers.		x	
5	5.NF.3	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	I can explain a fraction as division of the numerator by the denominator.		x	
			I can solve word problems involving division and write the remainder as a fraction.		x	
5	5.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.				
		a. Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)	I can explain the product of a whole number and a fraction using a visual fraction model.			
			I can explain the product of two fractions using a visual fraction model.			
			I can create a story to describe the equations.			
		b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	I can find the area of a rectangle with fractional sides.		x	
			I can show the area is the same as would be found through multiplication.		x	
			I can multiply fractional side lengths to find the area of rectangles.		x	
			I can show fraction products as rectangular areas.			
5	5.NF.5	Interpret multiplication as scaling (resizing), by:				
		a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	I can compare the size of a product to the size of one factor based on the size of the other factor.		x	
		b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n × a)/(n × b) to the effect of multiplying a/b by 1.	I can explain why multiplying a number by a fraction greater than 1 results in a product greater than the number.			
			I can explain why multiplying a number by a fraction less than 1 results in a product smaller than the number.			
5	5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	I can solve real-world problems involving multiplication of fractions and mixed numbers.		x	
5	5.NF.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.				
		a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.	I can explain division of a unit fraction by a whole number.		x	
			I can find the quotient of a division problem for a unit fraction and whole number.		x	
		b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.	I can explain division of a whole number by unit fraction.		x	
			I can find the quotient of a division problem for a whole number and a unit fraction.		x	
		c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?	I can solve real world problems involving division of unit fractions by whole numbers		x	
			I can solve real world problems involving division of whole numbers by unit fractions.		x	
Measurement and Data(MD)				***1***	***2***	***3***
5	5.MD.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	I can do measurement conversions within the same system.			x
			I can use these conversions to solve multi-step, real world problems.			x
5	5.MD.2	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.	I can make a line plot to display a set of measurements in fractions of a unit.			
			I can solve problems with the information on the line plot.			x
5	5.MD.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement.				
		a. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.	I can use a unit cube to measure volume.			x
		b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	I can identify the volume of a solid figure in cubic units.			x

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester		
5	5.MD.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	I can measure volume by counting unit cubes.			x
5	5.MD.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.				
		a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	I can show volume of a right rectangular prism by multiplying the edge lengths.			x
			I can show volume of a right rectangular prism by multiplying the height by the area of the base.			
		b. Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	I can use l x w x h and b x h to find volume for right rectangluar prisms in real world problems.			x
		c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	I can find the volume of a solid figure made of two non-overlapping parts by adding the volumes of the two right rectangular prisms in real world problems.			x
		Geometry(G)		***1***	***2***	***3***
5	5.G.1	Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).	I can identify the parts of a coordinate plane.			x
			I can plot a given point on the plane using ordered pairs.			x
5	5.G.2	Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	I can represent and interpret real world and math problems by graphing points on the coordinate plane.			x
5	5.G.3	Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	I can identify attributes and categories of two-dimensional figures.			x
5	5.G.4	Classify two-dimensional figures in a hierarchy based on properties.	I can classify two-dimensional figures in a hierarchy according to their attributes.			x

Sixth Grade

Grade	Benchmark	Benchmark Statement	'I can' Statement	Quarter			
		Ratios and Proportional Relationships(RP)		***1***	***2***	***3***	***4***
6	6.RP.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."	Recognize a ratio in various forms			x	
			Explain what a ratio is in their own words			x	
			Describe a ratio relationship			x	
6	6.RP.2	Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."	Express unit rate as a ratio of part-to-one			x	
			Use rate language to describe ratio relationship			x	
6	6.RP.3	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.					
		a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	Recognize a ratio in various forms			x	
			Explain what a ratio is in their own words			x	
			Describe a ratio relationship			x	
		b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	Solve unit pricing problems			x	
			Solve constant speed problems			x	
			Use concepts of unit rate to solve problems			x	
		c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.	Find a percent of a quantity as a rate per 100			x	
			Solve percent problems involving find the whole			x	
		d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Use ratio reasoning to convert measurement units			x	
			Manipulate and transform units appropriately when multiplying or dividing quantities			x	
		The Number System(NS)		***1***	***2***	***3***	***4***
6	6.NS.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?	Interpret quotients of fractions	x			
			Compute quotients of fractions	x			
			Solve word problems involving division of fractions by fractions	x			
6	6.NS.2	Fluently divide multi-digit numbers using the standard algorithm.	Divide multi-digit numbers using the standard algorithm	x			
6	6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	Add multi-digit decimals using the standards algorithm	x			
			Subtract multi-digit decimals using the standards algorithm	x			
			Multiply multi-digit decimals using the standards algorithm	x			
			Divide multi-digit decimals using the standards algorithm	x			
6	6.NS.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common	Find the greatest common factor (GCF) of two whole numbers less than or equal to 100	x			
			Find the least common multiple (LCM) of two whole numbers less than or equal to 12	x			

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
		factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).	Use the definitions of GCF and LCM along with the distributive property to express the sum of two whole numbers	x			
6	6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	Describe quantities having opposite directions or values		x		
			Use positive and negative numbers to represent quantities in real-world contexts		x		
			Explain the meaning of zero in each situation		x		
6	6.NS.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.					
		a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.	Recognize opposite signs of numbers as indicating locations on opposite sides of zero on a number line		x		
			Recognize that oppoiste of the opposite of a number is the number itself.		x		
			Recognize that zero is its own opposite.		x		
		b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.	Recognize the point where the x and y axis instersect at the origin		x		
			Identify the four quadrants of the coordinate plane		x		
			Identify the quadrant for an ordered paier based on the signs of the coordinates		x		
			Justify points realated by reflection across either or both axes differ only by sign(s)		x		
		c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	Plot all rational numbers on a horizontal and vertical number line		x		
			Identify the values of a given points on a horizontal and vertical number line		x		
			Plot ordered pairs on the coordinate plane		x		
6	6.NS.7	Understand ordering and absolute value of rational numbers.					
		a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 > –7 as a statement that –3 is located to the right of –7 on a number line oriented from left to right.	Compare two numbers on a number line based on their location		x		
			Express the comparison of two numbers using inequality symbols		x		
			Graph an inequality statement on a number line		x		
		b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3 oC > –7 oC to express the fact that –3 oC is warmer than –7 oC.	Explain inequalities used in real-world situatrions		x		
		c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.	Define absolute value		x		
			Use absolute value to describe magnitude or size in real-world situations.		x		
		d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.	Distinguish comparisons of absolute value from statements about order		x		
6	6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	Solve real-world problems by graphing points in all four quadrants		x		
			Find the distance between points with the same first or second coordinate		x		
		Expressions & Equations(EE)		***1***	***2***	***3***	***4***
6	6.EE.1	Write and evaluate numerical expressions involving whole-number exponents.	Write numerical expressions involving whole number exponents			x	
			Evaluate numerical expressions involving whole number exponents			x	
6	6.EE.2	Write, read, and evaluate expressions in which letters stand for numbers.					
		a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 – y.	Translate a description into a mathematical expression			x	
			Use a variable to represent an unknown quantity in an expression			x	
		b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.	Identify parts of an expression using mathematical vocabulary			x	
			Identify parts of an expression as single quantities			x	
		c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.	Simplify expressions when a value is given for a variable			x	
			Use Order of Operations without parentheses to simplify expressions that may include exponents			x	
6	6.EE.3	Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.	Simplify algebraic expressions using the properties of operations			x	
			Use the distributive property to write equivalent expressions by multiplying			x	
			Use the distributive property to write equivalent expressions by factoring coefficients			x	
6	6.EE.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.	Recognize equivalent expressions			x	
6	6.EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	Use substitution to determine whether a given number in a specified set makes an equation true			x	
			Use substitution to determine whether a given number in a specified set makes an inequality true			x	
6	6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	Use variables to represent unknown quantities			x	
			Write expressions to represent a mathematical situation			x	
			Write expressions to represent a real-world situation			x	
6	6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.	Use inverse operations to solve one-step equations using nonnegative rational numbers			x	
			Use the properties of equality to solve one-step equations using nonnegative rational numbers			x	
6	6.EE.8	Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	Recognize that infinity refers to a set of numbers that has no end but may not include all numbers			x	
			Recognize that a variable can stand for an infinite number of solutions when used in inequalities			x	
			Recognize that a constraint or condition in an inequality refers to the boundary defined in the solution set			x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
		line diagrams.	Write an inequality that represents real world mathematical problems that contain a constraint or condition			x	
			Graph an inequality on a number line			x	
6	6.EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	Use variable to represent two quantities in a real-world problem			x	
			Recognize that a change in the independent variable creates a change in the dependent variable			x	
			Recognize which quantitative relationships between dependent and independent variables are linear			x	
			Organize and display a set of data using tables and graphs			x	
			Make a table, graph, and/or equation to represent a problem context			x	
			Compare the relationship between the dependent and independent variables using graphs and tables			x	
Geometry(G)				***1***	***2***	***3***	***4***
6	6.G.1	Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	Relate the area of triangles to the area of rectangles				x
			Visually and physically decompose and compose polygons into rectangles and triangles to determine area				x
6	6.G.2	Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	Determine the volume of a right rectangular prism with fractional edge lengths				x
			Make the connection that when finding volume l x w is the same as B (area of the base)				x
			Use these formulas interchangeably, V = lwh and V = Bh				x
6	6.G.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	Draw polygons in the coordinate plane given coordinates for the vertices				x
			Use the coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate				x
			Explain that a line segment from one coordinate pair to another represents a distance				x
			Explain that two coordinates having the same x or y value are on the same line				x
			Recognize that the distance between two points on a coordinate plane is an absolute value				x
			Recognize that the units on a coordinate plane define the unit of distance measure				x
			Show how a coordinate plane can be used to represent real-world contexts (e.g., streets)				x
6	6.G.4	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.				x
Statistics & Probability(SP)				***1***	***2***	***3***	***4***
6	6.SP.1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.	Recognize that data generated from statistical questions will vary				x
			Recognize that responses to statistical questions have variations that can be used to draw conclusions about the data set				x
			Identify the difference between a statistical and non-statistical question				x
6	6.SP.2	Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	Interpret a set of data using center, spread, and overall shape				x
6	6.SP.3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	Recognize that a measure of center for a numerical data set summarizes all of its values using a single number				x
			Recognize that a measure of variation describes how its values vary with a single number				x
6	6.SP.4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	Organize numerical data on a dot plot				x
			Organize numerical data on a histogram				x
			Organize numerical data on a box plot				x
			Choose the appropriate graph to display data				x
6	6.SP.5	Summarize numerical data sets in relation to their context, such as by:					
		a. Reporting the number of observations.	Report the number of observations				x
		b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	Describe how the data was gathered				x
			Justify the appropriateness of the process used for data collection				x
			Choose an appropriate unit of measurement for the investigation				x
			Explain the importance of the unit of measurement used in the investigation				x
			Identify and describe the attribute being measured				x
		c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	Compute mean absolute deviation				x
			Compute interquartile range				x
			Summarize data sets in relation to measures of center				x
			Summarize data sets in relation to measures of variability				x
			Describe any overall pattern of data				x
			Describe any striking deviations from the overall pattern (outliers)				x
		d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	Choose the most appropriate measure of center to describe the data				x
			Choose the most appropriate measure of variability to describe the data				x
			Determine if a measure of center or a measure of variability is appropriate to describe a set of data				x

Seventh Grade

Grade	Benchmark	Benchmark Statement	'I can' Statement	Quarter			
Ratios & Proportional Relationships(RP)				***1***	***2***	***3***	***4***
7	7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.	Compute unit rates with ratios of fractions			x	
			Compute unit rates with ratios of lengths, areas, and other quantities			x	
			Compute unit rates with ratios measured in like units			x	
			Compute unit rates with ratios measured in different units			x	
7	7.RP.2	Recognize and represent proportional relationships between quantities.					
		a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	Determine if two quantities are proportional using a variety of methods (table, graphs, diagrams, equations, or verbal description)			x	
		b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	Identify the constant of proportionality in a table			x	
			Identify the constant of proportionality in a graph			x	
			Identify the constant of proportionality in an equation			x	
			Identify the constant of proportionality in a diagram			x	
			Identify the constant of proportionality in a verbal description			x	
		d. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship	Identify the unit rate by using the point (1, r)			x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
		proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.	Explain what the point (0, 0) on the graph of a proportional relationship means			x	
7	7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	Use a proportional relationship to solve multi-step ratio problems			x	
			Use a proportional relationship to solve multi-step percent problems			x	
The Number System(NS)				***1***	***2***	***3***	***4***
7	7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.					
		a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.	Describe situations in which opposite quantities combine to make 0	x			
		b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	Represent addition of rational numbers on a vertical or horizontal number line using the sign of the value being added to determine direction	x			
			Show that a number and its opposite are additive inverses	x			
			Describe sums of rational numbers in real world contexts	x			
		c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	Use the additive inverse to write a subtraction problem as an addition problem.	x			
			Show the distance between two rational numbers on the number line is the absolute value of their difference	x			
			Subtract rational numbers in real world contexts	x			
		d. Apply properties of operations as strategies to add and subtract rational numbers.	Add rational numbers using the properties of operations	x			
			Subtract rational numbers using the properties of operations	x			
7	7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.					
		a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	Relate the properties of multiplication of fractions to the multiplication of rational numbers	x			
			Use the rules for multiplying signed numbers to determine the sign of the product	x			
			Interpret products of rational numbers by describing real world situations	x			
		b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts.	Use multiplication of rational numbers to develop the procedure of dividing integers	x			
			Explain why dividing by zero is undefined	x			
			Use the rules for dividing signed numbers to determine the sign of the quotient	x			
			Interpret quotients of rational numbers by describing real world	x			
		c. Apply properties of operations as strategies to multiply and divide rational numbers.	Multiply rational numbers using the properties of operations	x			
			Divide rational numbers using the properties of operations	x			
		d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	Convert rational numbers into decimals using long division	x			
			Verify that the decimal form of rational numbers either terminates in 0's or eventually repeats	x			
7	7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.	Use Order of Operations to solve mathematical problems with rational numbers	x			
			Use Order of Operations to solve real world problems with rational numbers	x			
Expressions & Equations(EE)				***1***	***2***	***3***	***4***
7	7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Apply the properties of operations as strategies to add linear expressions with rational coefficients	x			
			Apply the properties of operations as strategies to subtract linear expressions with rational coefficients		x		
			Apply the properties of operations as strategies to factor linear expressions with rational coefficients		x		
			Apply the properties of operations as strategies to expand linear expressions with rational coefficients		x		
	7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."	Manipulate expressions to make equivalent expressions while problem solving		x		
7	7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	Solve multi-step mathematical problems with positive and negative rational numbers		x		
			Solve multi-step real world problems with positive and negative rational numbers		x		
			Apply properties of operations to calculate with numbers in any form	x			
			Assess the reasonableness of answers using mental computation and estimation	x			
7	7.EE.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.					
		a. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	Use a variable to represent an unknown quantity	x			
			Write a simple algebraic equation of the form px+q=r where (p, q, and r) are specific numbers to represent a real-world problem.	x			
			Use inverse operations and the properties of equality to solve word problems leading to equations of the form px + q = r where p, q, and r are specific numbers		x		
			Use inverse operations and the properties of equality to solve word problems leading to equations of the form p(x + q) = r where p, q, and r are specific numbers		x		
		b. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.	Write a simple algebraic inequality in the form px+q=r where (p, q, and r) are specific numbers to represent a real-world problem		x		
			Use inverse operations and the properties of inequality to solve word problems leading to inequalities of the form px + q > r where p, q, and r are specific numbers		x		
			Use inverse operations and the properties of inequality to solve word problems leading to inequalities of the form px + q < r where p, q, and r are specific numbers		x		
			Graph the solution set of the inequality		x		
			Interpret the solution set in relation to the problem		x		
Geometry(G)				***1***	***2***	***3***	***4***
7	7.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a	Solve problems involving scale drawings of geometric figures			x	
			Compute the actual length of a geometric figure from a scale drawing			x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
7	7.G.1	actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Compute the actual area of a geometric figure from a scale drawing			x	
			Reproduce a scale drawing at a different scale			x	
7	7.G.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	Draw geometric shapes from given conditions using multiple methods				x
			Construct triangles from three measures of angles				x
			Construct triangles from three measures of sides				x
			Determine if the given measures of angles or sides produce a unique triangle, more than one triangle, or no triangle.				x
7	7.G.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	Describe the two-dimensional figure that results from slicing a three dimensional figure				x
			Describe the two-dimensional figure that results from slicing a three dimensional figure				x
7	7.G.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	Describe the relationship between the circumference and area of a circle				x
			Use the formula for the circumference of a circle to solve problems	x			x
			Use the formula for the area of a circle to solve problems				x
			Determine the radius or diameter of a circle when the area or circumference is known		x		x
7	7.G.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	State relationships between supplementary, complementary, vertical, and adjacent angles				x
			Use facts about angles in a multi-step problem to write simple equations for an unknown angle in a figure				x
			Solve simple equations for an unknown angle in a figure				x
7	7.G.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	Solve mathematical and real-world problems involving area	x	x		x
			Solve mathematical and real-world problems involving volume		x		x
			Solve mathematical and real-world problems involving surface area				x
		Statistics & Probability(SP)		***1***	***2***	***3***	***4***
7	7.SP.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	Examine a sample of a population to gain information about the population			x	
			Recognize generalizations about a population from a sample are valid only if the sample is representative of that population			x	
			Produce representative samples by using random sampling to support valid inferences of the population			x	
7	7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	Use data from a random sample to draw inferences about a population with a unknown characteristic of interest			x	
7	7.SP.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.	Compare the centers (mean and median) or mode of two different data sets	x			
			Assess the similarities and differences between two data sets			x	
7	7.SP.4	Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.	Compare two populations by using the centers (means and/or medians) of data collected from random samples			x	
7	7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	Recognize that probability of a chance event is a number between 0 and 1			x	
			Express probability as the likelihood of the event occurring			x	
			Recognize that larger number indicate greater likelihood			x	
			Recognize that a probability near 0 indicates an unlikely event			x	
			Recognize that a probability around ½ indicates an event is equally likely or unlikely			x	
			Recognize that a probability near 1 indicates a likely event			x	
			Recognize that probability may be expressed as a decimal, percent, or ratio			x	
7	7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.	Collect data from a probability experiment			x	
			Predict the number of times an event will occur given a specific number of trials			x	
			Explain why theoretical probability will not always experimental probability			x	
			Recognize that as the number of trials increase the experimental probability approaches the theoretical probability			x	
7	7.SP.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.					
		a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	Extend the principles of probability of simple events to compound events			x	
		b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.	Represent sample spaces for compound events using multiple methods such as organized lists, tables and tree diagrams			x	

Eighth Grade(HS Pre-Algebra)

Grade	Benchmark	Benchmark Statement	'I can' Statement	Quarter			
		The Number System(NS)		***1***	***2***	***3***	***4***
8	8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	Distinguish between rational and irrational numbers	x			
			Show that the decimal representation of rational numbers terminates in 0's or eventually repeats	x			
			Convert a repeating decimal into a fraction	x			
8	8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	Determine between which two whole numbers a square root falls.				x
			Compare rational and irrational numbers on a number line				x
			Locate the approximate location of irrational numbers on a number line				x
			Estimate the value of an irrational expression				x
		Expressions and Equations(EE)		***1***	***2***	***3***	***4***
8	8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 32 × 3–5 = 3–3 = 1/33 = 1/27.	Infer the properties of integer exponents		x		
			Use laws of exponents to simplify numerical expressions(Zero exponent, negative exponent, product of powers, quotient of powers, power of a product, power of a quotient, power of a power, rational exponent		x		

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
8	8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	Use square root symbols to represent solutions to equations in the form $x^2 = p$ where p is a positive rational number				x
			Recognize that squaring a number and taking the square root of a number are inverse operations	x			
			Evaluate square root of a perfect square				x
			Justify the square root of a non-perfect square is irrational				x
8	8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 times 108 and the population of the world as 7 times 109, and determine that the world population is more than 20 times larger.	Express very small and very large numbers using scientific notation		x		
			Compare quantities expressed in scientific notation		x		
8	8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology	Perform operations with numbers expressed in scientific notation		x		
			Perform operations with numbers expressed in both decimal form and scientific notation		x		
			Use scientific notation to choose units of appropriate size for measurement of very large or very small quantities		x		
			Interpret scientific notation that has been generated by technology		x		
8	8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	Graph proportional relationships in a coordinate plane			x	
			Interpret the unit rate of a proportional relationship as s slope of the graph that intersects the origin			x	
			Compare two different proportional relationships represented in different ways, such as tables, graphs, and equations.		x		
8	8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	Derive the equation y = mx for a line through the origin			x	
			Derive the equation y = mx + b for a line intercepting the vertical axis at b with a slope of m.			x	
8	8.EE.7	Solve linear equations in one variable.					
		a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	Give examples of linear equations in one variable with one solution	x	x	x	x
			Give examples of linear equations in one variable with infinitely many solutions	x			
			Give examples of linear equations in one variable with no solutions	x			
			Use inverse operations and the properties of equality to solve linear equations in one variable	x	x	x	x
		b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	Solve linear equations with rational number coefficients and variables on both sides of the equation	x	x	x	x
			Solve linear equations involving the distributive property	x	x	x	x
			Solve linear equations involving collecting like terms	x	x	x	x
8	8.EE.8	Analyze and solve pairs of simultaneous linear equations.					
		a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	Explain that a line represents an infinite number of solutions to a linear equation with two variables.			x	
			Define the solution to a system of equations as the intersection of their lines			x	
		b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.	Solve systems of two linear equations in two variables algebraically				x
			Estimate the solution of two linear equations by graphing the equations				x
			Recognize that parallel lines have no solution and the same slope but different y-intercepts			x	
			Recognize that two equations with the same slope and the same y-intercept have infinite solutions			x	
		c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.	Solve real world problems leading to two linear equations in two variables			x	x
		Functions(F)		***1***	***2***	***3***	***4***
8	8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	Explain in a function the output depends on the input and there can be only one output for each input			x	
			Distinguish between functions and non-functions using equations, graphs, and tables			x	
8	8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	Determine the properties of a function written in algebraic form. (Slope, y-intercept, linear, non-linear)			x	
			Determine the properties of a function given the inputs and outputs in a table.			x	
			Determine the properties of a function represented as a graph.			x	
			Determine the properties of a function given verbally.			x	
			Compare properties of two functions each represented in a different way			x	
8	8.F.3	Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.	Interpret the equation y = mx + b as defining a linear function whose graph is a straight line and interpret the slope and y-intercept.			x	
			Give examples of functions that are not non-linear			x	
8	8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	Write a function to model a linear relationship between two quantities			x	
			Determine the rate of change of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph			x	
			Determine the initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph			x	
			Explain any constraints on the domain of the linear relationships			x	
8	8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	Recognize if the slope of a linear function is positive, negative, zero or undefined			x	
			Recognize when a function is increasing or decreasing			x	
			Recognize when a function is linear or non-linear			x	
			Sketch a graph to model a given verbal situation			x	
			Describe a situation when given a graph			x	
		Geometry(G)		***1***	***2***	***3***	***4***
8	8.G.1	Verify experimentally the properties of rotations, reflections, and translations:	Rotate geometric shapes in the coordinate plane			x	
			Reflect geometric shapes in the coordinate plane			x	
			Translate geometric shapes in the coordinate plane			x	
		a. Lines are taken to lines, and line segments to line segments of the same length.	Verify experimentally that lines that are rotated, reflected and/or translated transform to lines			x	
			Verify experimentally that line segments that are rotated, reflected and/or translated transform to line segments of the same length			x	
		b. Angles are taken to angles of the same measure.	Verify experimentally that angles that are rotated, reflected and/or translated transform to angles of the same measure			x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
		c. Parallel lines are taken to parallel lines	Verify experimentally that parallel lines that are rotated, reflected and/or translated transform to parallel lines			x	
8	8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	Infer that a rigid transformation preserves original size and shape			x	
			Describe a sequence of transformations that exhibits the congruency between two figures			x	
8	8.G.3	Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates.	Describe the effect of dilations on two-dimensional figures using coordinates			x	
			Describe the effect of translations on two-dimensional figures using coordinates			x	
			Describe the effect of rotations on two-dimensional figures using coordinates			x	
			Describe the effect of reflections on two-dimensional figures using coordinates			x	
8	8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	Determine that similar figures have angles with the same measure and sides that are proportional			x	
			Recognize that a dilation of a scale factor of greater than 1 will make the figure larger			x	
			Recognize that a dilation of a scale factor of less than 1 will make the figure smaller			x	
			Describe a sequence of transformations that exhibits the similarity between two figures			x	
8	8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.	Use exploration and deductive reasoning to determine relationships that exists between interior and exterior sums of triangles		x		
			Use exploration and deductive reasoning to determine relationships that exists between angles created when parallel lines are cut by a transversal		x		
			Use exploration and deductive reasoning to determine relationships that exists between the angle-angle criterion for similarity of triangles		x		
8	8.G.6	Explain a proof of the Pythagorean Theorem and its converse.	Explain a proof of the Pythagorean Theorem				x
			Explain a proof of the Pythagorean Theorem converse				x
8	8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in mathematical problems in two and three dimensions				x
			Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world problems in two and three dimensions				x
8	8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system				x
8	8.G.9	Know the formulas for the volume of cones, cylinders and spheres and use them to solve real-world and mathematical problems.	Derive the formula for the volume of a cone				x
			Derive the formula for the volume of a cylinder				x
			Derive the formula for the volume of a sphere				x
			Use the formulas to solve mathematical problems	x	x		x
			Use the formulas to solve real-world problems	x	x		x
			Statistics & Probability(SP)	***1***	***2***	***3***	***4***
8	8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	Recognize when a scatter plot represents a linear relationship			x	
			Informally fit a straight line for scatter plots that suggest a linear association			x	
			Informally assess the model fit by judging the closeness of the data to the points on the line			x	
8	8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.	Use the equation of a linear model to solve problems in the context of a linear problem			x	
			Interpret the slope of the equation of a linear model in the context of the problem			x	
			Interpret the y-intercept of the equations of a linear model in the context of the problem			x	
8	8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?	Recognize that categorical data can also be described numerically through the use of a two-way table			x	
			Construct a two-way table summarizing data on two categorical variables collected from the same subjects			x	
			Interpret a two-way table summarizing data on two categorical variables collected from the same subjects			x	
			Use relative frequencies calculated for rows or columns to describe possible association between the two variables			x	

HS General Math

Grade	**Benchmark**	**Benchmark Statement**	**'I can' Statement**	**Quarter**			
			Ratios & Proportional Relationships(RP)	***1***	***2***	***3***	***4***
HS	7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.	Compute unit rates with ratios of fractions	x			
			Compute unit rates with ratios of lengths, areas, and other quantities	x			
			Compute unit rates with ratios measured in like units	x			
			Compute unit rates with ratios measured in different units	x			
HS	7.RP.2	a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	Determine if two quantities are proportional using a variety of methods (table, graphs, diagrams, equations, or verbal description)				x
		b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	Identify the constant of proportionality in a diagram				x
		c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.	Represent a proportional relationship in an equation				x
			The Number System(NS)	***1***	***2***	***3***	***4***
HS	7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.					
		a. Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.	Describe situations in which opposite quantities combine to make zero.	x	x		
		b. Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	Represent addition of rational numbers on a vertical or horizontal number line using the sign of the value being added to determine direction	x	x		
			Show that a number and its opposite are additive inverses	x	x		
			Describe sums of rational numbers in real world contexts	x	x		
		c. Understand subtraction of rational numbers as adding the additive inverse, p – q = p + (–q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	Use the additive inverse to write a subtraction problem as an addition problem.	x	x		
			Show the distance between two rational numbers on the number line is the absolute value of their difference	x	x		
			Subtract rational numbers in real world contexts	x	x		
		d. Apply properties of operations as strategies to add and subtract rational numbers.	Add rational numbers using the properties of operations	x	x		
			Subtract rational numbers using the properties of operations	x	x		
		Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.					
		a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly	Relate the properties of multiplication of fractions to the multiplication of rational numbers	x	x		

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
HS	7.NS.2	requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	Use the rules for multiplying signed numbers to determine the sign of the product	x	x		
			Interpret products of rational numbers by describing real world situations	x	x		
		b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then –(p/q) = (–p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts.	Use multiplication of rational numbers to develop the procedure of dividing integers	x	x		
			Use the rules for dividing signed numbers to determine the sign of the quotient	x	x		
			Interpret quotients of rational numbers by describing real world	x	x		
		c. Apply properties of operations as strategies to multiply and divide rational numbers.	Multiply rational numbers using the properties of operations	x	x		
			Divide rational numbers using the properties of operations	x	x		
		d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	verify that the decimal form of rational numbers either terminates in 0's or eventually repeats	x	x		
HS	7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.	Use Order of Operations to solve mathematical problems with rational numbers	x	x		
			Use Order of Operations to solve real world problems with rational numbers	x	x		
		Expressions & Equations(EE)		***1***	***2***	***3***	***4***
HS	7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Apply the properties of operations as strategies to add linear expressions with rational coefficients		x		
			Apply the properties of operations as strategies to subtract linear expressions with rational coefficients		x		
HS	7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."	Manipulate expressions to make equivalent expressions while problem solving		x		
HS	7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	Solve multi-step mathematical problems with positive and negative rational numbers	x	x		
			Solve multi-step real world problems with positive and negative rational numbers	x	x		
			Apply properties of operations to calculate with numbers in any form	x	x		
			Assess the reasonableness of answers using mental computation and estimation	x	x	x	x
HS	7.EE.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.					
		a. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	Use a variable to represent an unknown quantity	x	x	x	x
			Write a simple algebraic equation of the form px+q=r where (p, q, and r) are specific numbers to represent a real-world problem.			x	
			Use inverse operations and the properties of equality to solve word problems leading to equations of the form px + q = r where p, q, and r are specific numbers			x	
			Use inverse operations and the properties of equality to solve word problems leading to equations of the form p(x + q) = r where p, q, and r are specific numbers			x	
		b. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.	Write a simple algebraic inequality in the form px+q=r where (p, q, and r) are specific numbers to represent a real-world problem			x	x
			Use inverse operations and the properties of inequality to solve word problems leading to inequalities of the form px + q > r where p, q, and r are specific numbers			x	x
			Use inverse operations and the properties of inequality to solve word problems leading to inequalities of the form px + q < r where p, q, and r are specific numbers			x	x
			Graph the solution set of the inequality			x	x
			Interpret the solution set in relation to the problem			x	x
		Geometry(G)		***1***	***2***	***3***	***4***
HS	7.G.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	Derive the formula for the circumference of a circle				x
			Derive the formula for the area of a circle				x
			Use the formula for the circumference of a circle to solve problems				x
			Use the formula for the area of a circle to solve problems				x
			Determine the radius or diameter of a circle when the area or circumference is known				x
HS	7.G.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	Solve mathematical and real-world problems involving area	x	x		x
		Statistics & Probability(SP)		***1***	***2***	***3***	***4***
HS	7.SP.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.	Compare the centers (mean and median) or mode of two different data sets	x	x		
HS	7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	Recognize that probability of a chance event is a number between 0 and 1				x
			Express probability as the likelihood of the event occurring				x
			Recognize that larger number indicate greater likelihood				x
			Recognize that a probability near 0 indicates an unlikely event				x
			Recognize that a probability around ½ indicates an event is equally likely or unlikely				x
			Recognize that a probability near 1 indicates a likely event				x
			Recognize that probability may be expressed as a decimal, percent, or ratio				x
HS	7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.	Collect data from a probability experiment				x
			Predict the number of times an event will occur given a specific number of trials				x
			Explain why theoretical probability will not always experimental probability				x
			Recognize that as the number of trials increase the experimental probability approaches the theoretical probability				x
HS	7.SP.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.					
		a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.	Develop a uniform theoretical probability model to represent a situation				x
			Determine the probability of the event from that model				x

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
		b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?	Conduct a probability experiment and develop a theoretical probability model to represent the situation				x
			Determine probability of the event from that model				x

Algebra 1

Grade	Benchmark	Benchmark Statement	'I can' Statement	Quarter			
		Number and Quanity(NQ)		***1***	***2***	***3***	***4***
Alg 1	HSN-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.	use exponential properties to explain how rational exponents follow from integer exponents			x	
Alg 1	HSN.RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	understand that the denominator of a rational exponent is the root index and the numerator is the exponent of the radicand			x	
			convert an expression in radical form to rational exponents and vice-versa			x	
Alg 1	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	interpret units in the context of the problem	x			
			use unit analysis to check the reasonability of your solution	x			
			choose and interpret an appropriate scale given data to be represented on a graph or display	x			
		Seeing Structure in Expressions(SSE)		***1***	***2***	***3***	***4***
Alg 1	HSA-SSE.A.1	Interpret expressions that represent a quantity in terms of its context					
		a. Interpret parts of an expression, such as terms, factors, and coefficients.	identify the different parts of an expression and explain their meaning within the context of a problem	x			
		b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.	interpret expressions and make sense of the multiple factors and terms by explaining the meaning of the individual parts	x			
Alg 1	HSA-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.	rewrite algebraic expressions in equivalent forms such as factoring or combining like terms	x			x
			use factoring techniques such as common factors, grouping, the difference of two squares, the sum or difference of two cubes, or a combination of methods to factor an expression completely				x
			simplify expressions by combining like terms, using the distributive property and using other operations with polynomials	x			
			recognize patterns and structures in expressions	x			
Alg 1	HSA-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.					
		a. Factor a quadratic expression to reveal the zeros of the function it defines.	write expressions in equivalent forms by factoring to find the zeros of a quadratic function and explain the meaning of the zeros				x
		b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	complete the square in a quadratic expression to convey the vertex form and determine the maximum or minimum value of the quadratic function, and to explain the meaning of the vertex				x
		c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈ 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	use properties of exponents (such as power of a power, product of powers, power of a product, power of a quotient) to write an equivalent form of an exponential function to reveal and explain specific information about its approximate rate of growth or decay			x	
		Arithmetic with Polynomials & Rational Expressions(APR)		***1***	***2***	***3***	***4***
Alg 1	HSA-APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	add, subtract, and multiply polynomials			x	
			recognize how closure applies under these operations				x
			relate the addition, subtraction, and multiplication of polynomials to the same operations with integers			x	
		Creating Equations(CED)		***1***	***2***	***3***	***4***
Alg 1	HSA-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	create linear, quadratic, rational and exponential equations and inequalities in one variable and use them in a contextual situation to solve problems	x	x	x	x
Alg 1	HSA-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	create equations in two or more variables to represent relationships between quantities	x			
			graph equations in two variables on a coordinate plane and label the axes and scales	x			
Alg 1	HSA-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	write and use a system of equations and/or inequalities to solve a real world problem	x			
			use equations and inequalities to represent problem constraints and objectives (linear programming)	x			
			interpret solutions to problems as viable or non-viable in a problem context	x			
Alg 1	HSA-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	solve multi-variable formulas or literal equations for a specific variable	x			
		Reasoning with Equations and Inequalities(REI)		***1***	***2***	***3***	***4***
Alg 1	HSA-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	construct a convincing argument that justifies each step in the solution process assuming an equation has a solution		x		
Alg 1	HSA-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	solve linear equations in one variable, including equations with coefficients represented by letters	x			
			solve linear inequalities in one variable, including inequalities with coefficients represented by letters	x			
Alg 1	HSA-REI.B.4	Solve quadratic equations in one variable.					
		a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	transform a quadratic equation to an equation in the form $(x-p)^2=q$ by completing the square				x
		b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.	solve quadratic equations in one variable by simple inspection, taking the square root, factoring, and completing the square				x
			use the quadratic formula to solve any quadratic equalion, recognizing the formula produces all complex solutions and write the solutions in the form a ± bi , where a and b are real numbers				x
Alg 1	HSA-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	produce, with justification, an equivalent simpler system from a system of two equations			x	
Alg 1	HSA-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	solve systems of equations using substitution, linear combination, and graphing			x	
Alg 1	HSA-REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle $x^2 + y^2 = 3$.	solve systems of equations using substitution, linear combination, and graphing			x	
		Understand that the graph of an equation in two variables is the set of all its solutions	find any solution to an equation in two variables from the graph of that equation			x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
Alg 1	HSA-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	explain that the set of all solutions to an equation in two variables can often be represented in the coordinate plane as a curve			x	
Alg 1	HSA-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	explain why the intersection of y = f(x) and y = g(x) is the solution of f(x) = g(x) for any combination of linear, polynomial, rational, absolute value, exponential, and logarithmic functions	x	x	x	x
			use technology to graph the equations and find their points of intersection			x	
			use tables of values or successive approximations to find solutions	x			
Alg 1	HSA-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	graph the solutions to a linear inequality in two variables as a half-plane		x		
			graph the solution set to a system of linear inequalities in two variables as the intersection of their corresponding half-planes			x	
		Interpreting Functions(IF)		***1***	***2***	***3***	***4***
Alg 1	HSF-IFA.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	use the definition of a function to determine whether a relationship is a function given a table, graph or words	x			
			identify x as an element of the domain and f(x) as an element in the range given the function	x			
			identify that the graph of the function f is the graph of the function y=f(x)	x			
Alg 1	HSF-IFA.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	use f(x) notation when a relation is determined to be a function	x			
			evaluate functions for inputs in their domains	x			
Alg 1	HSF-IFB.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	identify key features in graphs and tables to include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity for a given function	x	x	x	x
			sketch the graph of a function given its key features				x
Alg 1	HSF-IFB.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.	interpret a graph to determine the appropriate numerical domain being described	x			
Alg 1	HSF-IFB.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	calculate and interpret the average rate of change of a function presented symbolically or as a table		x		
			estimate the average rate of change over a specified interval of a function from its graph		x		
Alg 1	HSF-IFC.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	graph functions expressed symbolically and show key features of the graph (graph simple cases by hand and use technology to show more complicated cases)		x		
		a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	graph linear functions showing intercepts and graph quadratic functions showing intercepts, a maximum or a minimum				x
		b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions	graph square root, cube root and piecewise-defined functions, including step functions and absolute value functions				x
		c. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	graph exponential functions, showing intercepts and end behavior			x	
Alg 1	HSF-IFC.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	write a function in equivalent forms (eg. factored vs. general form) to show different properties of the function		x		
		a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	explain different properties of a function that are revealed by writing a function in equivalent forms		x		
			use the process of factoring and completing the square in a quadratic function to show zeros, a maximum or minimum, and symmetry of the graph, and interpret these in terms of a real-world situation				x
		b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02/, y = (0.97/, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.	use the properties of exponents to interpret exponential functions as growth or decay			x	
Alg 1	HSF-IFC.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	compare the key features of two functions that are represented in different ways				x
		Linear, Quadratic and Exponential Functions(LEA)		***1***	***2***	***3***	***4***
Alg 1	HSF-LEA.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.				x	
		a. Prove that linear functions grow by equal differences over equal intervals; exponential functions grow by equal factors over equal intervals.	determine a situation as linear or exponential by examining rates of change between data points			x	
			show there is a constant difference in a linear function over equal intervals	x			
		b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	show there is a constant multiplier in an exponential function over equal intervals			x	
			describe situations where one quantity changes at a constant rate per unit interval relative to another		x		
		c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	describe situations where one quantity grows or decays by a constant multiplier per unit interval relative to another		x		
Alg 1	HSF.LEA.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	use graphs and tables to make the connection that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or any other polynomial function			x	
Alg 1	HSF.LEA.5	Interpret the parameters in a linear, quadratic, or exponential function in terms of a context.	explain the meaning of the coefficients, constants, factors exponents, and intercepts in a linear, quadratic or exponential function in terms of a context		x		
		Statistics and Probability-Interpreting Data(IDA)		***1***	***2***	***3***	***4***
Alg 1	HSS.IDA.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related	create a scatter plot from two quantitative variables	x			
		a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models	categorize data within a scatter plot as linear, exponential, quadratic or neither		x		
		b. Informally assess the fit of a function by plotting and analyzing residuals.	Use algebraic methods or technology to fit the data to a linear, exponential or quadratic function and use the function to predict values		x		x
		c. Fit a linear function for a scatter plot that suggests a linear association.	categorize data as linear or non-linear		x		
			use algebraic methods or technology to fit the data to a linear function		x		
			use the function to predict values		x		

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
Alg 1	HSS.IDA.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	explain the meaning of the slope and y-intercept in context		x		
Geometry							
Grade	**Benchmark**	**Benchmark Statement**	**'I can' Statement**	**Quarter**			
Congruence(CO)				***1***	***2***	***3***	***4***
Geo	HS.G-CO.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	understand the definitions of angle, circle, perpendicular lines, parallel lines, and line segment based on the undefined notions of point, line, distance along a line, and length of an arc	x			x
			use the definitions of angle, circle, perpendicular lines, parallel lines, and line segment based on the undefined notions of point, line, distance along a line, and length of an arc	x			x
Geo	HS.G-CO.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	represent rigid and size transformations of figures in a coordinate plane		x		
			compare transformations that preserve distance and angle measure to those that do not		x		
			describe transformations (to include translations and horizontal and vertical stretching) on a set of points as inputs to produce another set of points as outputs		x		
Geo	HS.G-CO.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	describe the rotations and reflections of a rectangle, parallelogram, trapezoid, or regular polygon that map each figure onto itself		x		
Geo	HS.G.-CO.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	develop the meaning of rotations, reflections, and translations based on angles, circles, perpendicular lines, parallel lines, and line segments		x		
Geo	HS.G.-CO.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	draw the transformation (rotation, reflection, or translation) of a geometric figure using a variety of methods		x		
			create a sequence of transformations that maps a given geometric figure onto another		x		
Geo	HS.G.-CO.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	use descriptions of rigid motion and transformed geometric figures to predict the effects rigid motion has on figures in the coordinate plane		x		
			use the fact that rigid transformations preserve size and shape to connect the idea and definition of congruence		x		
Geo	HS.G.-CO.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	use the definition of congruence, based on rigid motions, to show two triangles are congruent if and only if their corresponding sides and corresponding angles are congruent		x		
Geo	HS.G.-CO.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	use the definition of congruence, based on rigid motion, to explain the triangle congruence criteria; ASA, SSS, and SAS		x		
Geo	HS.G.-CO.9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.	prove vertical angles are congruent	x			
			prove when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent	x			
			prove points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints		x		
Geo	HS.G.-CO.10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.	prove the measures of interior angles of a triangle have a sum of 180		x		
			prove the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length		x		
			prove the medians of a triangle meet at a point		x		
Geo	HS.G.-CO.11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.	prove opposite sides and angles are congruent			x	
			prove the diagonals of a parallelogram bisect each other			x	
			prove rectangles are parallelograms with congruent diagonals			x	
Geo	HS.G.-CO.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.	Use a variety of methods and tools to: cpy a segment, copy and angle, bisect a segment, bisect an angle, construct a perpendicular, and construct a line parallel to a given line.	x	x	x	x
Geo	HS.G.-CO.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	construct an equilateral triangle inscribed in a circle				x
			construct a square inscribed in a circle				x
			construct a regular hexagon inscribed in a circle				x
Similarity, Right Triangles and Trigonometry(SRT)				***1***	***2***	***3***	***4***
Geo	HS.G-SRT.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	determine whether two figures are similar			x	
			explain similarity based on the equality of corresponding angles and the proportionality of corresponding sides			x	
Geo	HS.G-SRT.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	use the properties of similarity transformations to prove triangles are similar by AA criterion			x	
Geo	HS.G-SRT.4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	use triangle similarity to prove other theorems about triangles to include: prove a line parallel to one side of a triangle divides the other two proportionally, and it's converse and prove the Pythagorean Theorem using triangle similarity			x	
Geo	HS.G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	use similarity criteria to solve real world problems involving geometric figures			x	
			use congruence criteria to solve real world problems involving geometric figures			x	
Geo	HS.G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	show that the side ratios are the same in similar right triangles, which leads to the definition of trigonometric ratios for acute angles			x	
Geo	HS.G-SRT.7	Explain and use the relationship between the sine and cosine of complentary angles	use the relationship between the sine and cosine of complementary angles			x	
			explain the relationship between the sine and cosine of complementary angles			x	
Geo	HS.G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems	apply trigonometric ratios and the Pythagorean Theorem to solve real world problems involving right triangles			x	
Geo	HS.G-SRT.11	Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non- right triangles (e.g., surveying problems, resultant forces).	apply any method to find unknown measurements in right triangles			x	
Circles(C)				***1***	***2***	***3***	***4***
Geo	HS.G-C.1	Prove that all circles are similar.	prove that all circles are similar; for example use the fact that the ratio of diameter to circumference is the same for circles				x
Geo	HS.G-C.2	*Identify and describe relationships among inscribed angles, radii, and chords.* Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle	use definitions, properties, and theorems to identify and describe relationships among inscribed angles, radii, and chords, including: central, inscribed, and circumscribed angles, show that inscribed angles on a diameter are right angles, and show that the radius of a circle is perpendicular to the tangent where the radius intersects the circle				x
Geo	HS.G-C.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	construct the inscribed circle of a triangle		x		
			construct the circumscribed circle of a triangle		x		
			Use definitions, properties, and theorems to prove properties of angles for a quadrilateral inscribed in a circle				x
Geo	HS.G-C.4	Construct a tangent line from a point outside a given circle to the circle.	construct a tangent line from a point outside a given circle to the circle				x

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
Geo	HS.G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angles as the constant of area of a sector.	Use similarity to rerive the fact that the length of the arc intercepted by an angle is proportional to the radius, identifying the constant of proportionality as the radian measure of the angle				x
			find the arc length of a circle				x
			use similarity to derive the formula for the area of a secotr				x
			Find the area of a sector				x
		Expressing Geometric Properties with Equations(GPE)		***1***	***2***	***3***	***4***
Geo	HS.G-GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	use the Pythagorean Theorem to derive the equation of a circle, given the center and radius				x
Geo	HS.G-GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).	use slope to prove that lines are parallel or perpendicular	x			
			solve geometric problems using slope of parallel and perpendicular lines	x			
Geo	HS.G-GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	find the point on a directed line segment between the two given points that divides the segment into a given ratio	x			
Geo	HS.G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	use coordinate geometry and the distance formula to find the perimeter of polygons and the area of triangles and rectangles	x		x	x
		Geometric Measurements and Dimension(GMD)		***1***	***2***	***3***	***4***
Geo	HS.G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	explain a derivation of the formulas for circumference of a circle and area of a circle				x
			explain a derivation of the formulas for volume of a cylinder, pyramid and cone				x
Geo	HS.G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	solve problems by using volume formulas for cylinders, pyramids, cones and spheres				x
		Modeling with Geometry(MG)		***1***	***2***	***3***	***4***
Geo	HS.G-MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	use geometric shapes, their measures, and their properties to describe objects	x	x	x	x
		Algebra 2					
Grade	**Benchmark**	**Benchmark Statement**	**'I can' Statement**	**Quarter**			
		Number and Quanity(CN)		***1***	***2***	***3***	***4***
Alg 2	HS-A2.CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form a + bi with a and b real.	recognize every number as a complex number of the form a+bi where a and b are real numbers		x		
			recognize i as complex and $i^2=-1$		x	x	
Alg 2	HS-A2.CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	apply the fact that the complex number $i^2=-1$ to perform operations on complex numbers		x		
Alg 2	HS-A2.CN.7	Solve quadratic equations with real coefficients that have complex solutions.	solve quadratic equations with real coefficients that have solutions of the form a+bi and a-bi		x		
Alg 2	HS-A2.CN.9	Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	recognize that the Fundamental Theorem of Algebra states that the number of complex solutions to a polynomial equation is equal to the degree of the polynomial			x	
			show that the Fundamental Theorem of Algebra is true for a quadratic polynomial			x	
Alg 2	HS.PC.CVM.6	Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.	represent and manipulate data using matrices, e.g., to organize merchandise, keep total sales and total costs		x		
Alg 2	HS.PC.CVM.7	Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.	multiply matrices by a scalar		x		
Alg 2	HS.PC.CVM.8	Add, subtract, and multiply matrices of appropriate dimensions.	identify the dimensions of a matrix as the number of rows and columns		x		
			add, subtract, and multiply matrices of appropriate dimension		x		
Alg 2	HS.PC.CVM.9	Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.	understand that matrix multiplication is not commutative (AB≠BA); however, matrix multiplication is associative and satisfies the distributive properties		x		
Alg 2	HS.PC.CVM.10	Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.	identify a zero matrix and understand that it behaves in matrix addition, subtraction, and multiplication much like 0 in the real number system		x		
			identify an identity matrix for a square matrix and understand that it behaves in matrix multiplication much like the number 1 in the real number system		x		
			find the determinant of a square matrix, and know that it is a nonzero value if the matrix has an inverse		x		
			recognize that if a matrix has an inverse, then the determinant of a square matrix is a nonzero value		x		
		Seeing Structure in Expressions(SSE)		***1***	***2***	***3***	***4***
Alg 2	HS-A2.SSE.1	Interpret expressions that represent a quantity in terms of its context a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)nas the product of P and a factor not depending on P.	interpret expressions that represent a quantity in terms of its context	x	x	x	x
			identify the different parts of an expression and explain their meaning within the context of a problem	x	x	x	x
			interpret expressions and make sense of the multiple factors and terms by explaining the meaning of the individual parts	x	x	x	x
Alg 2	HS-A2.SSE.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$	rewrite algebraic expressions in equivalent forms such as factoring or combining like terms	x	x	x	x
			use factoring techniques such as common factors, grouping, the difference of two squares, the sum or difference of two cubes, or a combination of methods to factor an expression completely		x	x	x
			simplify expressions by combining like terms, using the distributive property and using other operations with polynomials	x	x	x	x
			recognize patterns and structures in expressions	x	x	x	x
		Arithmetic with Polynomials and Rational Expressions(APR)		***1***	***2***	***3***	***4***
Alg 2	HS-A2.APR.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	identify polynomials		x	x	
			add, subtract, and multiply polynomials and recognize how closure applies under these operations		x	x	
			relate the addition, subtraction, and multiplication of polynomials to the same operations with integers		x	x	
Alg 2	HS-A2.APR.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the	apply the Remainder Theorem to a polynomial			x	

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Alg 2	HS-A2.APR.2	remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).	use the fact that a is a zero of a polynomial			x	
Alg 2	HS-A2.APR.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	find the zeros of a polynomial function when the polynomial is factored		x	x	
			use the zeros (x-intercepts) of a polynomial function to sketch a graph of the function		x	x	
Alg 2	HS-A2.APR.6	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.	Rewrite rational expressions using inspection or long division			x	
Alg 2	HS-A2.APR.7	Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	add, subtract, multiply, and divide rational expressions				x
		Creating Equations(CE)		***1***	***2***	***3***	***4***
Alg 2	HS-A2.CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	create linear, quadratic, rational and exponential equations and inequalities in one variable and use them in a contextual situation to solve problems	x	x	x	x
Alg 2	HS-A2.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	create equations in two or more variables to represent relationships between quantities	x	x	x	x
			graph equations in two variables on a coordinate plane and label the axes and scales	x	x	x	x
Alg 2	HS-A2.CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	write and use a system of equations and/or inequalities to solve a real world problem	x			
			interpret solutions to problems as viable or non-viable in a problem context	x	x	x	x
Alg 2	HS-A2.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	solve multi-variable formulas or literal equations for a specific variable	x			
		Reasoning with Equations and Inequalities(REI)		***1***	***2***	***3***	***4***
Alg 2	HS-A2.REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	solve simple rational equations in one variable				x
			solve simple radical equations in one variable			x	x
			provide examples of how extraneous solutions arise from solving simple rational and radical equations			x	x
Alg 2	HS-A2.REI.11	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	use technology to graph the equations and find their points of intersection	x			
			use tables of values or successive approximations to find solutions		x		
Alg 2	HS-PC.REI.8	Represent a system of linear equations as a single matrix equation in a vector variable.	write a system of linear equations as a single matrix equation		x		
Alg 2	HS-PC.REI.9	Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).	find the inverse of the coefficient matrix in the equation, if it exists		x		
			use the inverse of the coefficient matrix to solve the system		x		
			use technology for matrices with dimensions 3 by 3 or more		x		
		Interpreting Functions(IF)		***1***	***2***	***3***	***4***
Alg 2	HS.A2.IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	identify key features in graphs and tables to include intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity for a given function		x	x	
			sketch the graph of a function given its key features	x	x	x	x
Alg 2	HS-A2.IF.5	Relate the domain of the function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble *n* engines in a factory, then the positive intergers would be an appropriate domain for the function.	interpret a graph to determine the appropriate numerical domain being described	x	x	x	x
Alg 2	HS-A2.IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	calculate and interpret the average rate of change of a function presented symbolically or as a table	x			
Alg 2	HS-A2.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	graph functions expressed symbolically and show key features of the graph (graph simple cases by hand and use technology to show more complicated cases)				x
			graph square root, cube root and piecewise-defined functions, including step functions and absolute value functions			x	x
			graph polynomial functions, identifying zeros when factorable, and show end behavior		x	x	
Alg 2	HS-A2.IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	Write a function in equivalent forms (factored vs general)			x	x
			use the process of factoring and completing the square in a quadratic function to show zeros, a maximum or minimum, and symmetry of the graph, and interpret these in terms of a realworld situation			x	x
			use the properties of exponents to interpret exponential functions as growth or decay				x
Alg 2	HS.F-IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	compare the key features of two functions that are represented in different ways			x	
Alg 2	HS.F-BF.3	Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	experiment to identify, using technology, the transformational effects on the graph of a function f(x) when f(x) is replaced by f(x)+k, k·f(x), f(kx), and f(x+k) for specific values of k, both positive and negative	x			
			find the value of k given the graph of a transformed function	x			
Alg 2	HS.F-BF.4	Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^3$ or f(x) = (x+1)/(x-1) for x ≠ 1.	find the inverse of a given function	x			
			solve a function for the dependent variable and write the inverse of a function by interchanging the dependent and independent variables	x			

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
		Linear, Quadratic and Exponential Functions(TF)		***1***	***2***	***3***	***4***
Alg 2	HS.F-TF.4	For exponential models, express as a logarithm the solution to abct = d where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	express the solution to an exponential function as a logarithm using bases 2, 10, or e and evaluate a logarithm using technology				x
Alg 2	HS.F-TF.1	Understand that the radian measure of an angle is the length of the arc on the unit circle subtended by the angle.	identify when the length of an arc subtended by an angle is the same length as the radius of the circle then the angle is 1 radian				x
			explain that the length of the arc of a subtended angle on the unit circle is the radian measure of the angle				x
Alg 2	HS.F-TF.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	use the unit circle to extend the domain of the trigonometric functions beyond quadrant I and interpret the positive angles as counterclockwise rotations in radian form and negative angles as clockwise rotations in radian form				x
			explain the connection between the corresponding trigonometric function values in quadrant I and all trigonometric function values resulting from any radian angle measures				x
Alg 2	HS.F-TF.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline	choose a trigonometric function that models period phenomena given its amplitude, frequency and midline				x

Math Applications

Grade	Benchmark	Benchmark Statement	'I can' Statement	Quarter			
		Number and Quanity(Q.A)		***1***	***2***	***3***	***4***
Alg	HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	interpret units in the context of the problem	x			
			use unit analysis to check the reasonability of your solution	x			
			choose and interpret an appropriate scale given data to be represented on a graph or display	x	x	x	x
Alg	HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	choose a level of accuracy appropriate to the measuring tool or situation	x	x	x	x
		Seeing Structure in Expressions(SSE)		***1***	***2***	***3***	***4***
Alg	HSA-SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.	rewrite algebraic expressions in equivalent forms such as factoring or combining like terms	x			
			use factoring techniques such as common factors, grouping, the difference of two squares, the sum or difference of two cubes, or a combination of methods to factor an expression completely	x			
			simplify expressions by combining like terms, using the distributive property and using other operations with polynomials	x			
			recognize patterns and structures in expressions	x			
Alg	HSA-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.					
		a. Factor a quadratic expression to reveal the zeros of the function it defines.	write expressions in equivalent forms by factoring to find the zeros of a quadratic function and explain the meaning of the zeros	x			
		b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	complete the square in a quadratic expression to convey the vertex form and determine the maximum or minimum value of the quadratic function, and to explain the meaning of the vertex	x			
		c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15t can be rewritten as (1.151/12)12t ≈ 1.01212t to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	use properties of exponents (such as power of a power, product of powers, power of a product, power of a quotient) to write an equivalent form of an exponential function to reveal and explain specific information about its approximate rate of growth or decay	x			
		Creating Equations(CED)		***1***	***2***	***3***	***4***
Alg	HSA-CED.A.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	create linear, quadratic, rational and exponential equations and inequalities in one variable and use them in a contextual situation to solve problems	x			
Alg	HSA-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	create equations in two or more variables to represent relationships between quantities	x	x		
			graph equations in two variables on a coordinate plane and label the axes and scales	x	x	x	x
Alg	HSA-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	write and use a system of equations and/or inequalities to solve a real world problem		x		
			use equations and inequalities to represent problem constraints and objectives (linear programming)		x		
			interpret solutions to problems as viable or non-viable in a problem context		x		
Alg	HSA-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	solve multi-variable formulas or literal equations for a specific variable		x		
		Reasoning with Equations and Inequalities(REI)		***1***	***2***	***3***	***4***
Alg	HSA-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	construct a convincing argument that justifies each step in the solution process assuming an equation has a solution		x		
Alg	HSA-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	solve linear equations in one variable, including equations with coefficients represented by letters		x		
			solve linear inequalities in one variable, including inequalities with coefficients represented by letters		x		
Alg	HSA-REI.B.4	Solve quadratic equations in one variable.			x		
		a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	transform a quadratic equation to an equation in the form $(x-p)^2=q$ by completing the square		x		
		b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.	solve quadratic equations in one variable by simple inspection, taking the square root, factoring, and completing the square		x		
			use the quadratic formula to solve any quadratic equalion, recognizing the formula produces all complex solutions and write the solutions in the form a ± bi , where a and b are real numbers		x		
Alg	HSA-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	produce, with justification, an equivalent simpler system from a system of two equations		x		
Alg	HSA-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	solve systems of equations using substitution, linear combination, and graphing		x		
Alg	HSA-REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle $x^2 + y^2 = 3$.	solve systems of equations using substitution, linear combination, and graphing		x		
Alg	HSA-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	find any solution to an equation in two variables from the graph of that equation		x		
			explain that the set of all solutions to an equation in two variables can often be represented in the coordinate plane as a curve		x		
Alg	HSA-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of	graph the solutions to a linear inequality in two variables as a half-plane		x		

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Alg	HSA-REI.D.12	boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	graph the solution set to a system of linear inequalities in two variables as the intersection of their corresponding half-planes		x		
		Interpreting FunctionsIF)		***1***	***2***	***3***	***4***
Alg	HSF-IFB.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	calculate and interpret the average rate of change of a function presented symbolically or as a table			x	
			estimate the average rate of change over a specified interval of a function from its graph			x	
Alg	HSF-IFC.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	graph functions expressed symbolically and show key features of the graph (graph simple cases by hand and use technology to show more complicated cases)			x	
		a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	graph linear functions showing intercepts and graph quadratic functions showing intercepts, a maximum or a minimum			x	
		b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions	graph square root, cube root and piecewise-defined functions, including step functions and absolute value functions			x	
		c. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	graph exponential functions, showing intercepts and end behavior			x	
		b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02/, y = (0.97/, y = (1.01)12t, y = (1.2)t/10, and classify them as representing exponential growth or decay.	use the properties of exponents to interpret exponential functions as growth or decay			x	
		Linear, Quadratic and Exponential Functions(LEA)		***1***	***2***	***3***	***4***
Alg	HSF-LEA.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.		x	x	x	
		a. Prove that linear functions grow by equal differences over equal intervals; exponential functions grow by equal factors over equal intervals.	determine a situation as linear or exponential by examining rates of change between data points			x	
			show there is a constant difference in a linear function over equal intervals			x	
			show there is a constant multiplier in an exponential function over equal intervals			x	
		b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	describe situations where one quantity changes at a constant rate per unit interval relative to another			x	
		c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	describe situations where one quantity grows or decays by a constant multiplier per unit interval relative to another			x	
		Statistics and Probability-Interpreting Data(IDA)		***1***	***2***	***3***	***4***
Alg	HSS. IDA.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).	construct dot plots, histograms and box plots on a real number line			x	
Alg	HSS. IDA.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	describe a distribution using center and spread			x	
			use the correct measure of center and spread to describe a distribution that is symmetric or skewed			x	
Alg	HSS. IDA.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	identify outliers (extreme data points) and their effects on data sets			x	
			interpret differences in different data sets in context			x	
			interpret differences due to possible effects of outliers			x	
Alg	HSS. IDA.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	create a two-way table from two categorical variables and read values from two-way table			x	
			interpret joint, marginal, and relative frequencies in context			x	
			recognize associations and trends in data from a two-way table			x	
Alg	HSS.IDA.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related	create a scatter plot from two quantitative variables			x	
		b. Informally assess the fit of a function by plotting and analyzing residuals.	Use algebraic methods or technology to fit the data to a linear, exponential or quadratic function and use the function to predict values			x	
		c. Fit a linear function for a scatter plot that suggests a linear association.	categorize data as linear or non-linear			x	
			use algebraic methods or technology to fit the data to a linear function			x	
			use the function to predict values			x	
		Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	explain the meaning of the slope and y-intercept in context	x	x	x	x
Alg	HSS.IDA.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.	use a calculator or computer to find the correlation coefficient for a linear association	x	x	x	x
			interpret the meaning of the correlation coefficient in the context of the data	x	x	x	x
		Similarity, Right Triangles and Trigonometry(SRT)		***1***	***2***	***3***	***4***
Geo	HS.G-SRT.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	use similarity criteria to solve real world problems involving geometric figures				x
			use congruence criteria to solve real world problems involving geometric figures				x
Geo	HS.G-SRT.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	show that the side ratios are the same in similar right triangles, which leads to the definition of trigonometric ratios for acute angles				x
Geo	HS.G-SRT.7	Explain and use the relationship between the sine and cosine of complentary angles	use the relationship between the sine and cosine of complementary angles				x
			explain the relationship between the sine and cosine of complementary angles				x
Geo	HS.G-SRT.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems	apply trigonometric ratios and the Pythagorean Theorem to solve real world problems involving right triangles				x
Geo	HS.G-SRT.10	Prove the Laws of Sines and Cosines and use them to solve problems.	prove the Law of Sines and Cosines				x
			use the Laws of Sines and Cosines to solve real world problems				x
Geo	HS.G-SRT.11	Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non- right triangles (e.g., surveying problems, resultant forces).	apply any method to find unknown measurements in right triangles				x
			apply the Laws of Sines and Cosines to find unknown measurements in non-right triangles				x
		Circles(C)		***1***	***2***	***3***	***4***
Geo	HS.G-C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angles as the constant of area of a sector.	Use similarity to rerive the fact that the length of the arc intercepted by an angle is proportional to the radius, identifying the constant of proportionality as the radian measure of the angle				x
			find the arc length of a circle				x
			use similarity to derive the formula for the area of a secotr				x
			Find the area of a sector				x
		Expressing Geometric Properties with Equations(GPE)		***1***	***2***	***3***	***4***
Geo	HS.G-GPE.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	find the point on a directed line segment between the two given points that divides the segment into a given ratio				x
Geo	HS.G-GPE.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	use coordinate geometry and the distance formula to find the perimeter of polygons and the area of triangles and rectangles				x
		Geometric Measurements and Dimension(GMD)		***1***	***2***	***3***	***4***
Geo	HS.G-GMD.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's	explain a derivation of the formulas for circumference of a circle and area of a circle				x

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester			
Geo	HS.G-GMD.1	circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	explain a derivation of the formulas for volume of a cylinder, pyramid and cone				x
Geo	HS.G-GMD.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	solve problems by using volume formulas for cylinders, pyramids, cones and spheres				x
Geo	HS.G-GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	identify two dimensional cross sections of three dimensional objects				x
			identify three dimensional objects created by rotating two dimensional objects				x
Modeling with Geometry(MG)				***1***	***2***	***3***	***4***
Geo	HS.G-MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	use geometric shapes, their measures, and their properties to describe objects				x
Geo	HS.G-MG.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	use the concept of density whereferring to situations involving area and volume models, such aspersons per square mile				x
Geo	HS.G-MG.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	solve problems by designing an object or structure that satisfies certain constraints, such as minimizing cost or the enlargement of a picture using a grid, ratios, and proportions				x

Probability and Statistics

Grade	**Benchmark**	**Benchmark Statement**	**'I can' Statement**	**Quarter**	
Statistics and Probability(S-CP)				***1***	***2***
P & S	HS.S-CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not")	define a sample space and events within the sample space	x	
			identify subsets from sample space given defined events, including unions, intersections and complements of events	x	
P & S	HS.S-CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	determine whether two events A and B are independent using the probability of A and B occurring together and the probabilities of A and B -- [P(A and B) = P(A)P(B)]	x	
			identify two events as independent or not	x	
P & S	HS.S-CP.3	Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	show that the conditional probability of A given B as P(A and B)/P(B)	x	
			show that A and B are independent when the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B		x
P & S	HS.S-CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.	construct and interpret two-way frequency tables of data for two categorical variables and calculate probabilities from the table and use probabilities from the table to evaluate independence of two variables		x
P & S	HS.S-CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.	recognize and explain the concepts of independence and conditional probability in everyday situations		x
P & S	HS.S-CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	calculate conditional probabilities using the definition: "the conditional probability of A given B as the fraction of B's outcomes that also belong to A	x	
			interpret the conditional probability in context	x	
P & S	HS.S-CP.7	Apply the Addition Rule, P(A or B) = P(A) + P(B) - P(A and B), and interpret the answer in terms of the model.	identify two events as disjoint (mutually exclusive)	x	
			calculate probabilities using the Addition Rule	x	
			interpret the probability in context	x	
P & S	HS.S-CP.8	Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model.	calculate and interpret in context probabilities using the general Multiplication Rule	x	
P & S	HS.S-CP.9	Use permutations and combinations to compute probabilities of compound events and solve problems	identify situations as appropriate for use of a permutation or combination to calculate probabilities	x	
			use permutations and combinations in conjunction with other probability methods to calculate probabilities of compound events and solve problems	x	
Using Probability to Make Decisions(PMD)					
P & S	HS.S-PMD.6	Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	use expected values to help make good decisions		x
			use expected values to compare long term benefits of several situations		x
P & S	HS.S-PMD.7	Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	use probability concepts to analyze decisions made and strategies used in real-life situations		x
Interpreting Statistics(SMD)					
P & S	HS-PC.SMD.1	Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.	define what a random variable is and explain the properties of a random variable		x
			given a probability situation (theoretical or empirical), be able to define a random variable, assign probabilities to its sample space, create a table and graph of the distribution of the random variable		x
P & S	HS-PC.SMD.2	Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.	calculate and interpret in context the expected value of a random variable as the mean of the probability distribution		x
P & S	HS-PC.SMD.3	Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.	develop a theoretical probability distribution and find the expected value		x
P & S	HS-PC.SMD.4	Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?	develop an empirical probability and find the expected value		x
		Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.	set up a probability distribution for a random variable representing payoff values in a game of chance		x
		a. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.	find the expected payoff for a game of chance		x
		b. Evaluate and compare strategeis on the basis of expected values.	based on expected values develop a strategy to make informed decisions		x

Pre-Calculus

Grade	**Benchmark**	**Benchmark Statement**	**'I can' Statement**	**Quarter**	
Number and Quanity(CN)				**1**	**2**
Pre-Calc	HS.PC.CN.3	Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	find the conjugate of a complex number and use it to find quotients of complex numbers	x	
			find moduli (absolute value or magnitude) of a complex number	x	
Pre-Calc	HS.PC.CN.4	Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	represent a complex number on the complex plane in rectangular and polar form	x	
			explain why rectangular and polar forms of a complex number represent the same number	x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester	
Pre-Calc	HS.PC.CN.5	Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, $(1 – \sqrt{3}i)^3 = 8$ because $(1 – \sqrt{3}i)$ has modulus 2 and argument 120°.	geometrically represent operations of complex numbers on the complex plane	x	
			geometrically show that the conjugate of a complex number in a complex plane is the reflection over the x-axis	x	
			evaluate the power of a complex number in rectangular form using the polar form of that complex number	x	
Pre-Calc	HS.PC.CN.6	Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.	calculate the distance between numbers in the complex plane	x	
			calculate the midpoint of a segment in the complex plane	x	
Pre-Calc	HS.PC.CVM.1	Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, v).	identify a vector as a directed line segment representing magnitude and direction	x	
			use the appropriate symbolic representation for vectors and their magnitudes		x
Pre-Calc	HS.PC.CVM.2	Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point	find the component form of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point		x
Pre-Calc	HS.PC.CVM.3	Solve problems involving velocity and other quantities that can be represented by vectors.	solve problems involving velocity and other quantities that can be represented using vectors		x
Pre-Calc	HS.PC.CVM.4	Add and subtract vectors.	add and subtract vectors		x
		a. Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	add vectors head to tail, using the horizontal and vertical components, and by finding the diagonal formed by the parallelogram		x
		b. Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.	understand that the magnitude of a sum of two vectors is not the sum of the magnitudes unless the vectors have the same heading or direction		x
		c. Understand that vector subtractio **v-w** is defined as **v + (-w), where -w,** with the same magnitude as **w** and pointing in the opposite direction. Represent vector subtraciton graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	add two vectors geometrically or algebraically to determine the magnitude and direction of the resultant		x
			subtract vectors and know that vector subtraction is defined much like subtraction of real numbers, in that v – w is the same as v + (–w), where –w is the additive inverse of w; the opposite of w, -w, has the same magnitude but the direction of the angle differs by 180°		x
			represent vector subtraction on a graph by connecting the vectors head to tail and using the components of those vectors to find the difference		x
Pre-Calc	HS.PC.CVM.5	Multiply a vector by a scalar.	multiply a vector by a scalar		x
		a. Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplicaiton component-wise	represent scalar multiplication of vectors on a graph by changing the magnitude of the vector by the factor of the given scalar; if the scalar is less than zero, the new vector's direction is opposite the original vector's direction		x
			represent scalar multiplication of vectors using the component form, such as c(vx, vy) = (cvx, cvy)		x
		b. Compute the magnitude of a scalar multiple cv using ||cv|| = |c|v. Compute the direction of cv knowing that when |c|v ≠ 0, the direction of cv is either along v (for c > 0) or against v (for c < 0).	compute the magnitude of a scalar multiple, cv, as the magnitude of v multiplied by the factor of the |c| and when c > 0, the direction is the same or when c < 0, the direction of the vector is opposite the direction of the original vector		x
Pre-Calc	HS.PC.CVM.11	Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Understand a matrix as a transformation of vectors.	choose a matrix and use matrix multiplication to perform transformations of a vector		
Pre-Calc	HS.PC.CVM.12	Understand a 2 × 2 matrix as a transformation of the plane, and interpret the absolute value of the determinant in terms of area.	find the vector representation for two adjacent sides with the same initial point given the coordinates of the vertices of a parallelogram in the coordinate plane; write the components of the vectors in a 2x2 matrix and find the determinant of the 2x2 matrix (the absolute value of the determinant is the area of the parallelogram- this is called the dot product of the two vectors)	x	
		Interpreting Functions			
Pre-Calc	HS-PC.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	graph functions expressed symbolically and show key features of the graph (graph simple cases by hand and use technology to show more complicated cases)	x	
		d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.	graph rational functions, identifying zeros and asymptotes when factorable, and show end behavior	x	
		Building Functions(BF)			
Pre-Calc	HS-PC.BF.7	Write a function that describes a relationship between two quantities.	write a functions that describes a relationship between two quantities		x
		c. (+) Compose functions. For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function	compose functions and interpret the result in a real-world situation		x
Pre-Calc	HS-PC.BF.4	Find inverse functions.	find the inverse of a given function		x
		b. (+) Verify by composition that one function is the inverse of another.	verify that one function is the inverse of the other by composition		x
		c. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	read values of an inverse function from a graph or table		x
		d. (+) Produce an invertible function from a non- invertible function by restricting the domain.	restrict the domain on a function that is not one-to-one so that its inverse is a function		x
Pre-Calc	HS-PC.BF.5	Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	write an exponential function in logarithmic form and vice-versa		x
			solve problems involving logarithms and exponents		x
		Geometry(GPE)			
Pre-Calc	HS-PC.GPE.3	Derive the equations of ellipses and hyperbolas given foci, using the fact that the sum or difference of distances from the foci is constant.	given the foci, derive the equation of an ellipse, noting that the sum of the distances from the foci to any point on the ellipse is a constant	x	
			given the foci, derive the equation of a hyperbola, noting that the difference of the distances from the foci to any point on the hyperbola is a constant	x	
Pre-Calc	HS-PC.GMD.2	Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	use Cavalieri's Principle to provide informal arguments to develop the formulas for the volume of spheres and other solid figures	x	

Trigonometry

Grade	Benchmark	Benchmark Statement	'I can' Statement	Quarter	
		Trigonometric Functions(TF)			
Trig	N/A		convert from degree to radian measure	x	

Grade	Benchmark	Benchmark Statement	'I can' Statement	Trimester	
Trig	N/A	No State Benchmark Statements	convert into degrees minutes seconds	x	
Trig	N/A		find trig measures of special angles 0-90 degrees	x	x
Trig	N/A		find trig measures of special angles 0-360 degrees	x	x
Trig	N/A		define the six trig functions using x,r,y	x	
Trig	N/A		prove identities using the fundamental identities		x
Trig	N/A		solving trig equations		x
Trig	N/A		develop double angle formulas		x
Trig	N/A		develop half angle formulas		x
Trig	N/A		develop sum and difference formulas		x
Trig	N/A		repesent a periodic data with a function	x	
Trig	N/A		graph the six trig functions using transformations	x	
Trig	N/A		use trig functions to solve real world problems using law of cosines and sines and sohcahtoa	x	
Trig	N/A		solving plynomial equations for c omplex solutions	x	
Trig	N/A		represent complex solutions on the complex plane	x	
Trig	N/A		use DeMovre's theorem to take a complex number to a power	x	
Trig	N/A		convert between trig form and standard form of a complex number	x	
HS	HS.F-TF.3	Use special triangles to determine geometrically the valuesof sine, cosine, tangent for π/3, π/4 and π/6,and use theunit circle to express the values of sine, cosine, andtangent for π-x, π+x, and 2π-xin terms of their values forx, wherexis any real number.	use special triangles (45°-45°-90° and 30°-60°-90°) to determine the values of sine, cosine and tangent for π/3, π/4 and π/6		x
			use the unit circle to express the values of sine, cosine and tangent for π-x, π+x, and 2π-x in terms of their values for x		x
HS	HS.F-TF.4	Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	use the values of the trigonometric functions derived from the unit circle to explain how trigonometric functions repeat themselves (periodicity)		x
			use the unit circle to explain f(x) is an even function if f(-x)=f(x) for all x and that an even function is reflection symmetric over the y-axis		x
			use the unit circle to explain that f(x) is an odd function if f(-x)=-f(x) and that an odd function is symmetric with respect to the origin		x
HS	HS.T-TF.6	Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed	determine that when the domain of a trigonometric function is restricted such that the function is always increasing or decreasing, the inverse of the function can be constructed		x
HS	HS.F-TF.7	Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.	use the inverse functions to solve trigonometric equations that arise in real-world situations		x
			use technology to evaluate the solutions to the inverse trigonometric functions		x
			interpret solutions in terms of the context		x
H	HS.F-TF.9	Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	prove the addition and subtraction formulas sin(α±β), cos(α±β) and tan(α±β)		x
			use the addition and subtraction formulas for sine, cosine, and tangent to solve problems such as sin(105°) or cos(π/12)		x

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