

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
Unit 1 - Factors and Multiples						Common Unit Test		
Pacing - 20 days								
What are factors and multiples and how are they related?	Numeric fluency includes both the understanding of and the ability to appropriately use numbers.	The Number System SMP 6 – Attend to precision.	Compute fluently with multi-digit numbers and find common factors and multiples.	6.NS.B.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 factor as a multiple of a sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9+2)$.	Develop strategies for finding factors and multiples Classify numbers as prime, composite, even, odd, or square Recognize that factors of a number occur in pairs Solve problems involving factors and multiples	Use a strategy to find all the factors of a number. Provide an example using your strategy. Use a strategy to find all the multiples of a number up to 100. Provide an example using your strategy. Describe a situation where it's useful to know about factors and multiples. Describe a strategy to determine whether a number is prime, composite, or square. Provide an example using your strategy.		
What are factors and multiples and how are they related?	Numeric fluency includes both the understanding of and the ability to appropriately use numbers.	The Number System SMP 7 – Look for and make use of structure.	Compute fluently with multi-digit numbers and find common factors and multiples.	6.NS.B.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	Recognize situations that call for common factors and situations that call for common multiples Develop strategies for	Use a strategy to find the common factors and the greatest common factor of two numbers. Provide an example using your strategy. Use a strategy to		9.2.8.B.3 - Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9+2)$.	finding the least common multiple and the greatest common factor Solve problems involving common factors and common multiples	find the common multiples and the least common multiple of two numbers. Provide an example using your strategy. Describe how you can find the GCF/LCM of a two numbers. Differentiate between situations that call for common factors vs. common multiples.		extracurricular activities for use in a career.
How can different numerical expressions of a number be used to solve problems?	One representation may be more helpful than another; used together, multiple representations give a fuller understanding of the problem.	Expressions & Equations SMP 6 – Attend to precision.	Apply and extend previous understandings of arithmetic to algebraic expressions	6.EE.A.1 - Write and evaluate numerical expressions using whole number exponents 6.EE.A.2.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. <i>For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and</i>	Recognize and use the fact that every whole number can be written in exactly one way as a product of prime numbers. Use exponential notation to write repeated factors. Relate the prime factorization of two numbers to the least common multiple and greatest common	Determine the prime factorization of 48. Relate the prime factorization of two numbers to the GCF/LCM of two numbers.	W.6.2.A - Introduce a topic; organize ideas, concepts, and information, using text structures (e.g., definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g., headings, graphics, and multimedia) when useful to aiding comprehension.	9.3.ST.2 - Use technology to acquire, manipulate, analyze and report data.

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<i>a sum of two terms.</i>	factor of two numbers. Solve problems involving factors and multiples.			
How can mathematical properties & operations be used to solve problems?	Physical models can be used to clarify mathematical relationships. Reasoning and/or proof can be used to verify or refute conjectures or theorems in algebra.	Expressions & Equations SMP 8 – Look for and express regularity in repeated reasoning.	Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.1 - Write and evaluate numerical expressions using whole number exponents 6.EE.A.2.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. <i>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.</i> 6.EE.2.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-	Use order of operations to solve problems. Relate the area of a rectangle to the Distributive Property. Recognize that the Distributive Property relates the multiplicative and additive structures of whole numbers. Use the properties of operations of numbers, including the Distributive Property, and the Order of Operations convention to write equivalent numerical expressions.	Solve using order of operations: $7 + 3 \cdot 4^2$ $43 - 25/5 + 2$ Explain what the distributive property means for multiplication, addition, and subtraction. Given a word problem, decide which operation(s) can be used to solve, write the expression and solve using order of operations. Explain your reasoning.		

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</i>	Solve problems involving the Order of Operations and Distributive Property.			
Unit 2 – Ratios, Rational Numbers, and Equivalence						Common Unit Test		
Pacing - 25 days								
How can we compare and contrast rational numbers?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding of a problem	Ratios and Proportional Relationships	Understand ratio concepts and use ratio reasoning to solve problems.	<p>6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. <i>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."</i></p> <p>6.RP.A.2 - Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in</p>	<p>Expand interpretations of a fraction to include expressing a fraction as a part-whole relationship, as a number, and as an indicated division.</p> <p>Reason about the roles of the numerator and denominator in each of the interpretations of a fraction.</p> <p>Use the number line to reason about rational</p>	<p>Two different classes who reached 3/5 of their fundraising goals, however one class made more money than the other. Create a model showing this situation.</p> <p>Write three comparison statements about the same situation: using a difference, a fraction, and a ratio.</p> <p>Use a number line to accurately plot, compare, and order rational numbers between 0 & 1.</p>	W.6.1.B - Support claim(s) with clear reasons and relevant evidence, using credible sources and demonstrating an understanding of the topic or text.	9.3.ST-SM.4 - Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		<p>The Number System</p> <p>SMP 2 – Reason abstractly and quantitatively.</p>	<p>Apply and extend previous understandings of numbers to the system of rational numbers.</p>	<p>the context of a ratio relationship. <i>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."</i></p> <p>6.RP.A.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.</p> <p>6.NS.6.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.</p>	<p>number relationships.</p> <p>Recognize that fractions can represent both locations and distances on the number line.</p> <p>Use ratios and associated rates to compare quantities.</p> <p>Distinguish between a difference, which is an additive comparison, and a ratio, which is a multiplicative comparison.</p> <p>Distinguish between fractions as numbers and ratios as comparisons.</p> <p>Apply a variety of scaling strategies to solve problems involving ratios and unit rates</p>			

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
					<p>Recognize that equivalent fractions represent the same amount, distance, or location; develop strategies for finding and using equivalent fractions.</p> <p>Use partitioning and scaling strategies to generate equivalent fractions and ratios and to solve problems.</p> <p>Recognize that equivalent ratios represent the same relationship between two quantities; develop strategies for finding and using equivalent ratios.</p>			
How can we compare and contrast rational numbers?	Ratios and proportional relationships are used to express how	Ratio and Proportional Relationships	Understand ratio concepts and use ratio reasoning to solve	6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between	Expand interpretations of a fraction to include expressing a	Using a number line find five other fractions that are equivalent to $\frac{1}{3}$.		

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
	quantities are related and how quantities change in relation to each other.		problems.	<p>two quantities. <i>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."</i></p> <p>6.RP.A.2 - Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. <i>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."</i></p> <p>6.RP.A.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.</p>	<p>fraction as a part-whole relationship, as a number, and as an indicated division.</p> <p>Apply a variety of partitioning strategies to solve problems.</p> <p>Use ratios and associated rates to compare quantities.</p> <p>Distinguish between fractions as numbers and ratios as comparisons.</p> <p>Apply a variety of scaling strategies to solve problems involving ratios and unit rates.</p> <p>Recognize that a unit rate is a ratio in which one of the quantities being compared has a value of 1;</p>	<p>How can you determine a unit rate for a situation and explain how they are useful.</p> <p>How are your strategies for writing equivalent ratios the same or different as writing equivalent fractions.</p>		

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
					<p>use rate language in the context of a ratio relationship.</p> <p>Use partitioning and scaling strategies to generate equivalent fractions and ratios and to solve problems. Recognize that equivalent ratios represent the same relationship between two quantities; develop strategies for finding and using equivalent ratios.</p> <p>Build and use rate tables of equivalent ratios to solve problems.</p>			
How can we compare and contrast rational numbers?	Rational numbers can be represented in multiple ways and are useful when examining situations	The Number System SMP 2 – Reason abstractly and quantitatively.	Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.C.5 - Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature	Use multiple interpretations of proper fractions, improper fractions, and mixed numbers. Use decimals to	Provide examples of fractions & decimals that are greater than one and less than zero. Plot these fractions on a number line.	MS-ESS3-5. - Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past	

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
	involving numbers that are not whole.			<p>above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p>6.NS.C.6.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.</p> <p>6.NS.C.6.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.</p> <p>6.NS.C.7.A - Interpret statements of inequality</p>	<p>represent fractional quantities with attention to place value.</p> <p>Recognize that fractions are called <i>rational numbers</i> and that rational numbers are points on the number line.</p> <p>Recognize that fractions can represent both locations and distances on the number line.</p> <p>Recognize that a number and its opposite are at equal distances from zero on the number line; the opposite of a is $-a$ and the opposite of $-a$ is a.</p> <p>Recognize that the absolute value of a number is its distance from 0 on the number</p>	<p>How are numbers and their opposites represented on a number line.</p> <p>The absolute value of negative two is two. Explain why.</p>	century.	

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>as statements about the relative position of two numbers on a number line diagram. <i>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.</i></p> <p>6.NS.C.7.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. <i>For example, for an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars.</i></p>	<p>line and use it to describe real-world quantities.</p> <p>Develop meaningful strategies for representing fraction amounts greater than 1 or less than -1 as both mixed numbers and improper fractions.</p>			
What is the relationship between fractions, decimals, and percents?	One representation may sometimes be more helpful than another; used together, multiple representations give a fuller understanding	<p>Ratios and Proportional Relationships</p> <p>SMP 1 – Make sense of problems and persevere in solving them.</p>	Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. <i>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</i>	Introduce percent as a part-whole relationship in which the whole is not necessarily out of 100, but is scaled or partitioned to be "out of 100" or "per 100".	<p>Given the fraction $\frac{1}{5}$, find its equivalent decimal and percent.</p> <p>Given the decimal 0.25, find its equivalent fraction and percent.</p> <p>Given the percent</p>	MS-LS3-2. - Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual	9.3.ST-SM.2 - Apply science and mathematics concepts to the development of plans, processes and projects that address real world

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
	of a problem.			<p><i>1 beak." "For every vote candidate A received, candidate C received nearly three votes."</i></p> <p>6.RP.A.2 - Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. <i>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."</i></p> <p>6.RP.A.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.</p>	<p>Scale percents to predict new outcomes.</p> <p>Recognize that comparing situations with different-sized wholes is difficult without some common basis of comparison.</p> <p>Build and use rate tables of equivalent ratios to solve problems.</p>	<p>70%, find its equivalent fraction and decimal.</p> <p>How are percents used to make a comparison?</p> <p>Describe different strategies you can use to make comparisons.</p>	reproduction results in offspring with genetic variation.	problems.
Unit 3 - Understanding fraction operations.						Common Unit Test		
Pacing - 21 days								

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations	The Number System SMP 1 – Make sense of problems and persevere in solving them.	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	6.NS.B.3 - Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. 6.NS.B.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 factor as a multiple of a sum of two whole numbers with no common factor. <i>For example, express $36 + 8$ as $4(9 + 2)$.</i>	Use benchmarks and other strategies to estimate results of operations with fractions. Use estimates to check the reasonableness of exact computations. Give various reasons to estimate and identify when a situation calls for an overestimate or an underestimate. Use estimates and exact solutions to make decisions. Determine when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem. Develop ways to model sums,	What are some situations in which estimating sums and differences useful? When is it useful to over or underestimate? Suppose you are helping a student. Explain how to add and subtract fractions. Give an example of a type you think is easiest and hardest to explain.	W.6.1.A - Introduce claim(s) and organize the reasons and evidence clearly.	9.3.12.AC.1 - Use vocabulary, symbols and formulas common to architecture and construction.

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
					<p>differences, products, and quotients with areas, fraction strips, and number lines.</p> <p>Use knowledge of fractions and equivalence of fractions to develop algorithms for adding, subtracting, multiplying, and dividing fractions.</p> <p>Solve real-world problems using arithmetic operations on fractions.</p>			
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations	Expressions and Equations SMP 4 – Model with mathematics.	Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.3 - Apply the properties of operations to generate equivalent expressions. <i>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</i>	<p>Use estimates to check the reasonableness of exact computations.</p> <p>Give various reasons to estimate and identify when a situation calls for an overestimate or an underestimate.</p>	<p>Explain and illustrate what “of” means when you find a fraction of another number. What operation do you use when you find part of a part?</p> <p>Use a square or a circle to model the product of $\frac{1}{2}$ and $\frac{3}{4}$.</p> <p>Explain why the</p>		

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p><i>(4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.</i></p>	<p>Use estimates and exact solutions to make decisions.</p> <p>Determine when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem.</p> <p>Develop ways to model sums, differences, products, and quotients with areas, fraction strips, and number lines.</p> <p>Use knowledge of fractions and equivalence of fractions to develop algorithms for adding, subtracting, multiplying, and dividing fractions.</p> <p>Solve real-world problems using</p>	<p>answer to $\frac{1}{2} \times \frac{3}{4}$ is less than both numbers in the problem.</p>		

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
					<p>arithmetic operations on fractions.</p> <p>Recognize that when you multiply or divide a fraction, your answer might be less than or more than the numbers you started with</p>			
How do operations affect numbers?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations	The Number System	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	6.NS.A.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. <i>For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of</i>	<p>Use estimates to check the reasonableness of exact computations.</p> <p>Use estimates and exact solutions to make decisions.</p> <p>Determine when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem.</p> <p>Develop ways to model sums, differences, products, and quotients with</p>	<p>When solving a problem how do you recognize when division is the operation you need to use?</p> <p>Explain your strategy for dividing a fraction by another fraction.</p> <p>Why is the quotient of $2\frac{1}{2} \div \frac{3}{4}$ greater than $2\frac{1}{2}$?</p>	2.1.6.A.3 - Determine factors that influence the purchase of healthcare products and use of personal hygiene practices.	9.3.12.ED-TT.5 - Establish a positive climate to promote learning.

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		Expressions and Equations SMP 4 – Model with mathematics.	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	<p><i>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? Compute fluently with multi-digit numbers and find common factors and multiples.</i></p> <p>6.EE.A.2.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. <i>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.</i></p>	<p>areas, fraction strips, and number lines.</p> <p>Use knowledge of fractions and equivalence of fractions to develop algorithms for adding, subtracting, multiplying, and dividing fractions.</p> <p>Compare and contrast dividing a whole number by a fraction to dividing a fraction by a whole number.</p> <p>Recognize that when you multiply or divide a fraction, your answer might be less than or more than the numbers you started with.</p>			

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
How are inverse operations used to solve mathematical problems?	Computational fluency includes understanding the meaning and the appropriate use of numerical operations	Expressions and Equations SMP 5 – Use appropriate tools strategically.	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	<p>6.EE.A.2.A - Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation "Subtract y from 5" as $5 - y$.</i></p> <p>6.EE.A.2.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. <i>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.</i></p> <p>6.EE.A.2.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</p>	<p>Solve real-world problems using arithmetic operations on fractions.</p> <p>Determine when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem.</p> <p>Write fact families with fractions to show the inverse relationship between addition and subtraction, and between multiplication and division.</p> <p>Represent unknown real-world and abstract values with variables.</p> <p>Write equations (or number sentences) to represent relationships among real-</p>	<p>How do you decide which operation to use when solving a problem?</p> <p>How is the relationship between addition and subtraction like the relationship between multiplication and division? How are they different?</p> <p>How do fact families help you figure out "N" in a sentence such as $N \div 2\frac{1}{2} = 1\frac{1}{4}$</p>	RI.6.4 - Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.	

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Reason about and solve one-variable equations and inequalities.	<p>when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</i></p> <p>6.EE.B.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.</p> <p>6.EE.B.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.</p>	<p>world and abstract values.</p> <p>Use fact families to solve for unknown values.</p>			
Unit 4 - Geometric Measurement						Common Unit Assessments		

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
How can spatial relationships be described by careful use of geometric language?	Geometric relationships provide a means to make sense of a variety of phenomena.	Geometry	Solve real-world and mathematical problems involving area, surface area, and volume.	6.G.A.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.	<p>Deepen the understanding of area and perimeter of rectangular and nonrectangular shapes.</p> <p>Relate area to covering a figure.</p> <p>Relate perimeter to surrounding a figure.</p> <p>Analyze what it means to measure area and perimeter.</p> <p>Develop and use formulas for calculating area and perimeter.</p> <p>Develop techniques for estimating the area and perimeter of an irregular figure.</p>	<p>Identify each situation as area or perimeter.</p> <ul style="list-style-type: none"> * painting a wall * fencing a yard * carpeting a room * framing a picture <p>Given a rectangle of 60 square meters describe the rectangle with the greatest perimeter and describe the rectangle with the least perimeter.</p> <p>Given a rectangle with a perimeter of 20 meters, describe the rectangle with the least area and describe the rectangle with the greatest area.</p>	1.3.8.D.1 - Incorporate various art elements and the principles of balance, harmony, unity, emphasis, proportion, and rhythm/movement in the creation of two- and three-dimensional artworks, using a broad array of <u>art media</u> and <u>art mediums</u> to enhance the expression of creative ideas (e.g., perspective, implied space, illusionary depth, value, and pattern).	9.3.ST-SM.2 - Apply science and mathematics concepts to the development of plans, processes and projects that address real world problems.
		The Number System	Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.C.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.	<p>Develop and use formulas for calculating area and perimeter.</p>			
		Expressions and Equations	Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.2.C - Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including	<p>Explore relationships between perimeter and area, including</p>			
		SMP 4 – Model with mathematics.						

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</i></p> <p>6.EE.A.3 - Apply the properties of operations to generate equivalent expressions. <i>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 $3y$.</i></p>	<p>that one can vary considerably while the other stays fixed.</p> <p>Visually represent relationships between perimeter and area on a graph.</p> <p>Solve problems involving area and perimeter of rectangles.</p>			
			Reason about and solve one-variable equations and	6.EE.B.6 - Use variables to represent numbers and write expressions when				

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			<p>inequalities.</p> <p>Represent and analyze quantitative relationships between dependent and independent variables.</p>	<p>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.</p> <p>6.EE.C.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.</p>				

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
How can we best represent and verify geometric/algebraic relationships?	Reasoning and/or proof can be used to verify or refute conjectures or theorems in geometry.	Geometry	Solve real-world and mathematical problems involving area, surface area, and volume.	6.G.A.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.	Deepen the understanding of area and perimeter of rectangular and nonrectangular shapes. Relate area to covering a figure. Relate perimeter to surrounding a figure. Analyze what it means to measure area and perimeter. Develop and use formulas for calculating area and perimeter. Recognize that a triangle can be thought of as half of a rectangle whose sides are equal to the base and height of the triangle. Know that the choice of base of	Find the area of a triangle with a base of 3 cm and a height of 9 cm. How is finding the area of a triangle related to finding the area of a rectangle? What can you say about the area and perimeter of a triangle that have the same base and height? Provide evidence to support your answer.	W.6.1 - Write arguments to support claims with clear reasons and relevant evidence.	9.3.12.ED-AD M.2 - Identify behaviors necessary for developing and sustaining a positive learning culture.
		Expressions and Equations	Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.2.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). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</i>				
		SMP 3 – Construct viable arguments and critique the reasoning of others.		6.EE.A.3 - Apply the				

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>properties of operations to generate equivalent expressions. <i>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 $3y$.</i></p> <p>6.EE.A.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). <i>For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</i></p>	<p>a triangle (or parallelogram) is arbitrary but that the choice of the base determines the height.</p> <p>Recognize that there are many triangles (or parallelograms) that can be drawn with the same base and height.</p> <p>Develop formulas and strategies, stated in words or symbols, for finding the area and perimeter of triangles and parallelograms.</p> <p>Solve problems involving area and perimeter of parallelograms and triangles.</p> <p>Solve problems involving area and perimeter of polygons by composing into rectangles or</p>			
			Reason about and solve one-variable	6.EE.B.6 - Use variables to represent numbers and write				

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			equations and inequalities.	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.	decomposing into triangles.			
How can we best represent and verify geometric/algebraic relationships?	Reasoning and/or proof can be used to verify or refute conjectures or theorems in geometry.	Geometry	Solve real-world and mathematical problems involving area, surface area, and volume	<p>6.G.A.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.</p> <p>6.G.A.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</p>	<p>Deepen the understanding of area and perimeter of rectangular and nonrectangular shapes.</p> <p>Relate area to covering a figure.</p> <p>Relate perimeter to surrounding a figure.</p> <p>Analyze what it means to measure area and perimeter.</p> <p>Develop and use formulas for calculating area and perimeter.</p> <p>Analyze how the area of a triangle</p>	<p>How is finding the area of a parallelogram similar to finding the area of a triangle and the area of a rectangle?</p> <p>Find the area of a parallelogram with a base of 10.5 mm. and a height of 8.2 mm.</p> <p>What can you say about the area and perimeter of two parallelograms that have the same base and height? Explain your reasoning.</p> <p>Plot the coordinates on the coordinate plane and determine the perimeter of the polygon.</p>	VA:Pr4.1.6a - Analyze similarities and differences associated with preserving and presenting two dimensional, three dimensional, and digital artwork.	

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		The Number System	Apply and extend previous understandings of numbers to the system of rational numbers.	problems. 6.NS.C.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.	and the area of a parallelogram are related to each other and to the area of a rectangle. Recognize that a parallelogram can be decomposed into two triangles. Thus the area of a parallelogram is twice the area of a triangle with the same base and height as the parallelogram.			
		Expressions & Equations	Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.2.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). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the</i>	Know that the choice of base of a triangle (or parallelogram) is arbitrary but that the choice of the base determines the height.			
		SMP 1 – Make sense of problems and persevere in solving them.			Recognize that there are many triangles (or parallelograms) that can be drawn with the same base and height.			

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Reason about and solve one-variable equations and inequalities.	<p><i>volume and surface area of a cube with sides of length $s = 1/2$.</i></p> <p>6.EE.A.3 - Apply the properties of operations to generate equivalent expressions. <i>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 $3y$.</i></p> <p>6.EE.B.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.</p>	<p>Develop formulas and strategies, stated in words or symbols, for finding the area and perimeter of triangles and parallelograms.</p> <p>Find the side lengths and area of polygons on a coordinate grid.</p> <p>Solve problems involving area and perimeter of parallelograms and triangles.</p> <p>Solve problems involving area and perimeter of polygons by composing into rectangles or decomposing into triangles</p>			

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Represent and analyze quantitative relationships between dependent and independent variables.	6.EE.C.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.				
How do geometric relationships help to solve problems and/or make sense of phenomena?	Geometric relationships provide a means to make sense of a variety of phenomena.	Geometry	Solve real-world and mathematical problems involving area, surface area, and volume.	6.G.A.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	Solve problems involving area and perimeter of rectangles. Extend the understanding of the volume of rectangular prisms.	Using a net, determine the surface area of a 3X4X10 rectangular prism. Calculate the volume of a rectangular prism with a length of $2\frac{1}{2}$	MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of	9.3.12.ED-AD M.2 - Identify behaviors necessary for developing and sustaining a positive learning culture.

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>context of solving real-world and mathematical problems.</p> <p>6.G.A.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 $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</p> <p>6.G.A.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.</p>	<p>Relate volume to filling a three-dimensional figure.</p> <p>Extend understanding of the strategies for finding the volume of rectangular prisms to accommodate fractional side lengths.</p> <p>Relate finding area of two-dimensional shapes to finding the surface area of three-dimensional objects.</p> <p>Develop strategies for finding the surface area of three-dimensional objects made from rectangles and triangles.</p> <p>Solve problems involving surface</p>	<p>inches, width of $4\frac{1}{4}$ inches, and a height of 3 inches.</p> <p>Describe a strategy for finding the surface area of a 3-D figure.</p> <p>How does knowing the area of a 2-D figure help you find the surface area of a 3-D figure?</p> <p>What information is necessary to find the volume of prisms?</p>	<p>each that can be combined into a new solution to better meet the criteria for success.</p>	
		Expressions	Apply and	6.EE.A.2.C - Evaluate				

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		and Equations	extend previous understandings of arithmetic to algebraic expressions.	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). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</i>	area of prisms and pyramids and volume of rectangular prisms.			
			Reason about and solve one-variable equations and inequalities.	6.EE.B.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.				
			Represent and analyze	6.EE.C.9 - Use variables to represent				

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			quantitative relationships between dependent and independent variables.	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.				
Mid-Year Assessment Pacing – One Day								
Unit 5 - Computing with Decimals and Percents Pacing - 21 days						Common Unit Assessments		
How can ratios and proportional relationships be used to determine unknown quantities?	Ratios and proportional relationships are used to express how quantities are related and how quantities	Ratios & Proportional Relationships SMP 1 – Make sense of problems and	Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. <i>For example, "The ratio of wings to beaks in the</i>	Use estimates to solve problems and check answers. Recognize when addition, subtraction,	How can you determine what operation to use when solving a problem involving decimals? Describe a strategy	SL.6.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with	

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
	change in relation to each other.	persevere in solving them.		<p><i>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."</i></p> <p>6.RP.A.2 - Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. <i>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."</i></p> <p>6.RP.A.3.B - Solve unit rate problems including those involving unit pricing and constant speed. <i>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?</i></p>	<p>multiplication, or division is the appropriate operation to solve a problem.</p> <p>Solve problems using arithmetic operations on decimals, including finding unit rates.</p>	<p>you use when solving a problem with decimals and why it is helpful to you.</p> <p>We paid \$75 for 15 hamburgers. What is the unit rate?</p> <p>How can unit rates be helpful to determine a better price?</p>	diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.	

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
How can computational strategies be applied to practical situations?	Computational fluency includes understanding the meaning and the appropriate use in given situations.	The Number System Expressions & Equations SMP 7 – Look for and make use of structure.	Compute fluently with multi-digit numbers and find common factors and multiples. Apply and extend previous understandings of arithmetic to algebraic expressions. Reason about and solve one-variable equations and inequalities.	6.NS.B.3 - Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. 6.EE.A.2.A - Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation "Subtract y from 5" as $5 - y$.</i> 6.EE.B.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. 6.EE.B.6 - Use variables to represent numbers and write expressions when solving a real-world or	Use estimates to solve problems and check answers. Use place value to develop understanding of algorithms and to relate operations with decimals to the same operations with fractions. Solve problems using arithmetic operations on decimals, including finding unit rates. Use fact families to write and solve equivalent number sentences.	Why is it necessary to line up the decimal points when adding or subtracting decimals? Solve the following problems: $27.618 + 9.52$ $28 - 4.35$	9.2.8.B.5 - Analyze labor market trends using state and federal labor market information and other resources available online.	

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		Attend to precision.		which p , q and x are all nonnegative rational numbers.	<p>multidigit whole numbers.</p> <p>Develop standard algorithms for multiplying and dividing decimals with the aid of, at most, paper and pencil.</p> <p>Find a repeating or terminating decimal equivalent to a given fraction.</p> <p>Use fact families to write and solve equivalent number sentences.</p> <p>Use multiplication sentences to check division sentences.</p>	<p>$3.7 * 5.2$</p> <p>$5.31 \div 0.3$</p> <p>What is the fact family connection between multiplying and dividing decimals?</p>		

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
<p>How can computational strategies be applied to practical situations?</p> <p>How can ratios and proportional relationships be used to determine unknown quantities?</p>	<p>Computational fluency includes understanding the meaning and the appropriate use in given situations.</p> <p>Ratios and proportional relationships are used to express how quantities are related and how quantities change in relation to each other.</p>	<p>The Number System</p> <p>Ratios & Proportional Relationships</p> <p>Expressions & Equations</p>	<p>Compute fluently with multi-digit numbers and find common factors and multiples.</p> <p>Understand ratio concepts and use ratio reasoning to solve problems.</p> <p>Apply and extend previous understandings of arithmetic to algebraic expressions.</p>	<p>6.NS.B.3 - Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p> <p>6.RP.A.3.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.</p> <p>6.EE.A.3 - Apply the properties of operations to generate equivalent expressions. <i>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 $3y$.</i></p>	<p>Recognize when addition, subtraction, multiplication, or division is the appropriate operation to solve a problem.</p> <p>Solve problems using arithmetic operations on decimals, including finding unit rates.</p> <p>Develop models for percent problems.</p> <p>Write and solve number sentences involving percents.</p> <p>Write number sentences to represent relationships between both real-world and abstract values.</p> <p>Use fact families to write and solve equivalent number</p>	<p>With a subtotal of \$8.53 and a percent of tax of 7%, calculate the grand total.</p> <p>A skateboard costs \$35. It is on sale for 25% off. What is the discounted price?</p> <p>How do you determine the original price if you know the discount?</p> <p>How do you determine the percent one number is of another?</p>		<p>9.1.4.E.2 Apply comparison shopping skills to purchasing decisions.</p> <p>9.1.8.A.1 Explain the meaning and purposes of taxes and tax deductions and why fees for various benefits (e.g., medical benefits) are taken out of pay</p>

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>6.EE.B.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.</p> <p>6.EE.B.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.</p>	sentences.			
Unit 6 – Focus on Algebra Pacing - 38 days						Common Unit Assessments		
How can ratios and proportional relationships be used to determine unknown quantities?	Ratios and proportional relationships are used to express how quantities are related and how quantities change in relation to	Ratios & Proportional Relationships	Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.A.3.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	<p>Explore problem situations that involve variables and relationships.</p> <p>Interpret the “stories” told by patterns in tables and coordinate</p>	<p>What are the pros and cons of showing patterns with tables, graphs, and written reports?</p> <p>How can you determine average speed? How do a table and a graph</p>	6.1.4.B.3 - Explain how and when it is important to use digital geographic tools, political maps, and globes to measure distances and to	9.3.ST-SM.2 - Apply science and mathematics concepts to the development of plans, processes and projects that address real

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
	each other.			ratios. 6.RP.A.3.B - Solve unit rate problems including those involving unit pricing and constant speed. <i>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?</i> 6.RP.A.3.D - Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	graphs of numeric (x, y) data. Represent the pattern of change that relates two variables in words, data tables, graphs, and equations. Investigate situations that change over time. Examine increasing and decreasing patterns of change. Compare linear and nonlinear patterns of change by using tables or graphs. Use tables, graphs, and equations to find the value of a variable given the value of the associated variable.	(time, distance) data show speed?	determine time zones and locations using latitude and longitude.	world problems.
		The Number System	Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.C.6.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. 6.NS.C.8 - Solve real-world and mathematical problems by graphing				

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		<p>Expressions & Equations</p> <p>SMP 3 – Construct viable arguments and critique the reasoning of others.</p>	<p>Represent and analyze quantitative relationships between dependent and independent variables.</p>	<p>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.</p> <p>6.EE.C.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</p>	<p>Describe advantages and disadvantages of using words, tables, graphs, and equations to represent patterns of change relating two variables and make connections across those representations.</p> <p>Calculate average speed and show how it is reflected in a table or graph and vice versa.</p> <p>Solve problems that involve variables.</p>			

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				relationship between distance and time.				
How can algebraic representations be used to generalize patterns and relationships?	The symbolic language of algebra is used to communicate and generalize the patterns in mathematics.	The Number System	Apply and extend previous understandings of numbers to the system of rational numbers.	<p>6.NS.C.6.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.</p> <p>6.NS.C.6.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.</p> <p>6.NS.C.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</p>	<p>Explore problem situations that involve variables and relationships.</p> <p>Identify the dependent and independent variables and describe how they are related in a situation.</p> <p>Interpret the “stories” told by patterns in tables and coordinate graphs of numeric (x, y) Data.</p> <p>Represent the pattern of change that relates two variables in words, data tables, graphs, and equations.</p> <p>Investigate situations that change over time.</p>	<p>It takes Ben 40 minutes to mow each field on a farm. Create a table showing how long (t) it will take Ben to mow 2, 3, 4, and 5 fields (f). Identify the dependent and independent variables.</p> <p>When the relationship between independent and dependent variables is displayed in a graph, what can you learn about the relationship from a rising graph, a level graph, and a falling graph?</p> <p>Plot the following ordered pairs on a coordinate plane:</p> <p>$(2, -8)$ $(-4, -5)$ $(0, 3)$ $(-1, 7)$</p> <p>Is the line segment</p>	MS-PS3-1 - Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	9.3.ST.2 - Use technology to acquire, manipulate, analyze and report data.

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		<p>Expressions & Equations</p> <p>SMP 7 – Look for and make use of structure.</p>	<p>Represent and analyze quantitative relationships between dependent and independent variables.</p>	<p>distances between points with the same first coordinate or the same second coordinate.</p> <p>6.EE.C.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.</p>	<p>Examine increasing and decreasing patterns of change.</p> <p>Compare linear and nonlinear patterns of change by using tables or graphs.</p> <p>Use tables, graphs, and equations to find the value of a variable given the value of the associated variable.</p> <p>Explore relationships that require graphing in all four quadrants.</p> <p>Describe advantages and disadvantages of using words, tables, graphs, and equations to represent patterns of change relating two variables</p>	<p>connecting points T(-8, -9), N(-8, 6) horizontal or vertical? What is the length of the line segment?</p>		

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
					and make connections across those representations. Solve problems that involve variables.			
How can algebraic representations be used to generalize patterns and relationships?	The symbolic language of algebra is used to communicate and generalize the patterns in mathematics.	Expressions & Equations	Apply and extend previous understandings of arithmetic to algebraic expressions.	6.EE.A.2.A - Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation "Subtract y from 5" as $5 - y$.</i> 6.EE.A.2.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). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface</i>	Explore problem situations that involve variables and relationships. Identify the dependent and independent variables and describe how they are related in a situation. Interpret the "stories" told by patterns in tables and coordinate graphs of numeric (x, y) Data. Represent the pattern of change that relates two variables in words, data tables, graphs, and equations.	Create an equation to express the relationships in given tables and graphs. If the value of one variable in a relationship is known, describe how you can use a table, graph, or equation to find the value of the other variable.		

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Reason about and solve one-variable equations and inequalities.	<p><i>area of a cube with sides of length $s = 1/2$.</i></p> <p>6.EE.B.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.</p> <p>6.EE.B.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.</p>	<p>Investigate situations that change over time.</p> <p>Examine increasing and decreasing patterns of change.</p> <p>Use tables, graphs, and equations to find the value of a variable given the value of the associated variable.</p> <p>Describe advantages and disadvantages of using words, tables, graphs, and equations to represent patterns of change relating two variables and make connections across those representations.</p>			
		Ratios & Proportional Relationships	Understand ratio concepts and use ratio reasoning to solve problems.	6.RP.A.2 - Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. <i>For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar,</i>	Write an equation to express the			
		SMP 5 – Use appropriate						

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		tools strategically.		<p><i>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."</i></p> <p>6.RP.A.3.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.</p> <p>6.RP.A.3.B - Solve unit rate problems including those involving unit pricing and constant speed.<i>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?</i></p> <p>6.RP.A.3.D - Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing</p>	<p>relationship between two variables in one and two operations: $y=mx$, $y=b+x$, and $y=b+mx$.</p> <p>Calculate average speed and show how it is reflected in a table or graph and vice versa.</p> <p>Recognize and express direct proportionality relationships with a unit rate ($y=mx$) and represent these relationships in rate tables and graphs.</p> <p>Solve problems that involve variables.</p> <p>Use properties of operations, including the Distributive Property and the Order of Operations, to write equivalent</p>			

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				quantities.	<p>expressions for the dependent variable in terms of the independent variable.</p> <p>Interpret and evaluate expressions in which letters stand for numbers and apply the Order of Operations as needed.</p> <p>Recognize that equations are statements of equivalence between two expressions.</p> <p>Solve linear equations of the forms $y=ax$, $y=b+x$, and $y=b+ax$ using numeric guess and check, tables of (x, y) values, and graphs or fact families.</p>			
How can algebraic representations be used to	The symbolic language of algebra is used to	Ratios & Proportional Relationships	Understand ratio concepts and use ratio reasoning to	6.RP.A.3.A - Make tables of equivalent ratios relating quantities with whole-number	Explore problem situations that involve variables and	At the South Pole, the temperature was -19°F . At the North Pole, the	MS-ESS3-3 - Apply scientific principles to design a method	9.3.12.ED-AD M.2 - Identify behaviors necessary for

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
generalize patterns and relationships?	communicate and generalize the patterns in mathematics.	Expressions & Equations	<p>solve problems.</p> <p>Apply and extend previous understandings of arithmetic to algebraic expressions.</p>	<p>measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.</p> <p>6.RP.A.3.B - Solve unit rate problems including those involving unit pricing and constant speed. <i>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?</i></p> <p>6.EE.A.2.A - Write expressions that record operations with numbers and with letters standing for numbers. <i>For example, express the calculation "Subtract y from 5" as $5 - y$.</i></p> <p>6.EE.A.2.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</p>	<p>relationships.</p> <p>Identify the dependent and independent variables and describe how they are related in a situation.</p> <p>Represent the pattern of change that relates two variables in words, data tables, graphs, and equations.</p> <p>Use tables, graphs, and equations to find the value of a variable given the value of the associated variable.</p> <p>Write an equation to express the relationship between two variables in one and two operations: $y=mx$, $y=b+x$, and $y=b+mx$.</p>	<p>temperature was -16°F. Write an inequality to show where it is warmer. Then write a sentence to describe your inequality.</p> <p>Is it possible to have to different, but equivalent expressions for a given situation? Explain.</p> <p>How can you represent and find solutions to inequalities?</p> <p>In the expression, $3x + 7 + 5y$, identify the coefficients and the total number of terms.</p>	for monitoring and minimizing a human impact on the environment.	developing and sustaining a positive learning culture.

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>single entity. <i>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.</i></p> <p>6.EE.A.2.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). <i>For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.</i></p> <p>6.EE.A.3 - Apply the properties of operations to generate equivalent expressions. <i>For example, apply the distributive property to the expression $3(2 + x)$</i></p>	<p>Solve problems that involve variables.</p> <p>Use tables, graphs, or properties of numbers such as the Distributive Property to show that two expressions are equivalent.</p> <p>Recognize that equations are statements of equivalence between two expressions.</p> <p>Solve linear equations of the forms $y=ax$, $y=b+x$, and $y=b+ax$ using numeric guess and check, tables of (x, y) values, and graphs or fact families.</p> <p>Write an inequality and associate it with an equation to find solutions and graph the</p>			

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Reason about and solve one-variable equations and inequalities.	<p><i>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 $3y$.</i></p> <p>6.EE.A.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). <i>For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</i></p> <p>6.EE.B.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</p>	solutions on a number line			

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>determine whether a given number in a specified set makes an equation or inequality true.</p> <p>6.EE.B.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.</p> <p>6.EE.B.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.</p> <p>6.EE.B.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</p>				

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

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			Represent and analyze quantitative relationships between dependent and independent variables.	<p>that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.</p> <p>6.EE.C.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.</p>				
Unit 7 – Statistics & Data Analysis Pacing – 29 days						Common Unit Assessments		

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			distributions.	<p>on a number line, including dot plots, histograms, and box plots.</p> <p>6.SP.B.5.A - Reporting the number of observations.</p> <p>6.SP.B.5.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.</p>	<p>histograms, and box-and-whisker plots.</p> <p>Recognize that a graph shows the overall shape of a distribution, whether the data values are symmetrical around a central value, and whether the graph contains any unusual characteristics such as gaps, clusters, or outliers.</p> <p>Distinguish between and compute measures of central tendency (mean, median, and mode) and measures of spread (range, interquartile range (IQR), and mean absolute deviation (MAD))</p> <p>Identify how the median and mean respond to</p>			

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
					<p>changes in the data values of a distribution.</p> <p>Describe the amount of variability in a distribution by noting whether the data values cluster in one or more areas or are fairly spread out.</p>			
What does the collection of data and statistics tell us?	The message conveyed by the data depends on how the data is collected, represented, and summarized.	<p>Statistics & Probability</p> <p>SMP 8 – Look for and express regularity in repeated reasoning.</p>	Develop understanding of statistical variability.	<p>6.SP.A.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 on anticipates variability in students' ages.</p> <p>6.SP.A.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.</p>	<p>Ask questions, collect and analyze data, and interpret data to answer questions.</p> <p>Describe data with respect to its shape, center, and variability or spread.</p> <p>Distinguish between categorical data and numerical data, and identify which graphs and statistics can be used to represent each kind of data.</p> <p>Recognize that a</p>	<p>Describe a method for calculating the mean of a set of data and explain why your method works.</p> <p>Why are mean, median, and mode called measures of center and what does each tell you about a set of data?</p> <p>One student says you can only use the mode to describe categorical data but you can use the mode, median, and mean to describe numerical data. Is that student correct? Can you find the range for categorical data? Explain.</p>	8.1.8.A.4 - Graph and calculate data within a spreadsheet and present a summary of the results.	9.3.ST-SM.4 - Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Summarize and describe distributions.	<p>6.SP.A.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.</p> <p>6.SP.B.4 - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p>6.SP.B.5.A - Reporting the number of observations.</p> <p>6.SP.B.5.B - Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.</p> <p>6.SP.B.5.C - Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any</p>	<p>graph shows the overall shape of a distribution, whether the data values are symmetrical around a central value, and whether the graph contains any unusual characteristics such as gaps, clusters, or outliers.</p> <p>Distinguish between and compute measures of central tendency (mean, median, and mode) and measures of spread (range, interquartile range (IQR), and mean absolute deviation (MAD)).</p> <p>Identify how the median and mean respond to changes in the data values of a distribution.</p>			

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</p> <p>6.SP.B.5.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.</p>	Relate the choice of measures of central tendency and variability to the shape of the distribution and the context			
What does the collection of data and statistics tell us?	The message conveyed by the data depends on how the data is collected, represented, and summarized.	Statistics & Probability	Develop understanding of statistical variability.	<p>6.SP.A.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 on anticipates variability in students' ages.</p> <p>6.SP.A.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</p>	<p>Ask questions, collect and analyze data, and interpret data to answer questions.</p> <p>Describe data with respect to its shape, center, and variability or spread.</p> <p>Distinguish between and compute measures of central tendency (mean, median, and mode) and measures of spread (range, interquartile</p>	<p>Find the mean absolute deviation of the following data set:</p> <p>39, 31, 37, 39, 34, 35, 34, 30, 36, 42</p> <p>Describe how you can use the IQR and MAD to compare how two data distributions vary.</p>	<p>2.1.6.B.4 - Compare and contrast nutritional information on similar food products in order to make informed choices.</p> <p>2.1.6.A.1 - Explain how health data can be used to assess and improve each dimension of personal wellness.</p>	9.3.12.ED-AD M.2 - Identify behaviors necessary for developing and sustaining a positive learning culture.

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Summarize and describe distributions.	<p>overall shape.</p> <p>6.SP.A.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.</p> <p>6.SP.B.4 - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p>6.SP.B.5.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.</p> <p>6.SP.B.5.D - Relating the choice of measures of center and variability</p>	<p>range (IQR), and mean absolute deviation (MAD)).</p> <p>Describe the amount of variability in a distribution by noting whether the data values cluster in one or more areas or are fairly spread out.</p> <p>Use measures of center and spread to compare data distributions.</p>			

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
		The Number System	Apply and extend previous understandings of numbers to the system of rational numbers.	6.NS.C.7 - Understand ordering and absolute value of rational numbers.				
What does the collection of data and statistics tell us?	The message conveyed by the data depends on how the data is collected, represented, and summarized.	Statistics & Probability SMP 5 – Use appropriate tools strategically.	Develop understanding of statistical variability.	6.SP.A.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 on anticipates variability in students' ages. 6.SP.A.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.	Ask questions, collect and analyze data, and interpret data to answer questions. Describe data with respect to its shape, center, and variability or spread. Organize and represent data using tables, dot plots, line plots, ordered-value bar graphs, frequency bar graphs, histograms, and box-and-whisker plots.	The basketball team scored the following points in their games: 75, 68, 75, 78, 70, 79, 76, 80, 72, 65, 72, 66, 70, 75, 80, 76 Create a box plot, line plot, and histogram using this data set. How do you decide which graph is most appropriate for a given data set?	2.1.6.B.4 - Compare and contrast nutritional information on similar food products in order to make informed choices.	9.3.ST.2 - Use technology to acquire, manipulate, analyze and report data.

Hillsborough Township Public Schools
Mathematics Department
Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
			Summarize and describe distributions.	<p>6.SP.A.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.</p> <p>6.SP.B.4 - Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p>6.SP.B.5.A - Reporting the number of observations.</p> <p>6.SP.B.5.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.</p> <p>6.SP.B.5.D - Relating</p>	<p>Make informed decisions about which graphs or tables can be used to display a particular set of data.</p> <p>Recognize that a graph shows the overall shape of a distribution, whether the data values are symmetrical around a central value, and whether the graph contains any unusual characteristics such as gaps, clusters, or outliers.</p> <p>Distinguish between and compute measures of central tendency (mean, median, and mode) and measures of spread (range, interquartile range (IQR), and mean absolute deviation</p>			

Hillsborough Township Public Schools
 Mathematics Department
 Grade 6 Curriculum Map

Essential Questions	Enduring Understandings	Domain	Cluster	Standard	Learning Targets	Assessment Formative and Summative	Inter-disciplinary Connections	21 st Century Connections
				<p>the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.</p>	<p>(MAD)).</p> <p>Identify how the median and mean respond to changes in the data values of a distribution.</p> <p>Relate the choice of measures of central tendency and variability to the shape of the distribution and the context.</p> <p>Describe the amount of variability in a distribution by noting whether the data values cluster in one or more areas or are fairly spread out.</p> <p>Use measures of center and spread to compare data distributions</p>			
<p>End-Year Assessment Pacing - One Day</p>								