Summit Public Schools Summit, New Jersey Grade Level: <u>4th Grade</u>/ Content Area: <u>Math</u>

Course Description

(1) developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

(2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., 15/9 = 5/3), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

(3) Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Topic: Numbers and Operations in Base Ten		
enVision Math 2020 Units of Study Topic 1 - Generalize Place Value Understanding Topic 2 - Fluently Add and Subtract Multi-Digit Topic 3 - Use Strategies and Properties to Multiply by 1-Digit Numbers Topic 4 - Use Strategies and Properties to Multiply by 2-Digit Numbers Topic 5- Use Strategies and Properties to Divide by 1-Digit Numbers Topic 6 - Use Operations with Whole Numbers to Solve Problems	 Recommended Texts to Support Topic: enVision Math 2020 Resources: Realize Online Platform Student Editions 	
 Big Ideas: Course Objectives/Content Statement(s) Utilize understanding of place value by roundin Fluently add and subtract large numbers using Arrays, area models, and/or equations be used to Place value understanding and properties of op Arrays, area models, and/or equations be used to 	eg and comparing the standard algorithm to solve multi-digit multiplication equations erations be used to multiply multi-digit numbers to solve multi-digit division equations	
Essential Questions What provocative questions will foster inquiry, understanding, and transfer of learning?	Enduring Understandings What will students understand about the big ideas?	
 How can whole numbers be written? How can whole numbers be compared? How are digits in numbers related to one another? How can sums and differences of whole numbers be estimated? What are standard procedures for adding and subtracting whole numbers? How can you multiply by multiples of 10, 100, and 1,000? How can you use a model to multiply? How can you use the Distributive Property to multiply? How can you use multiplication to solve problems? What real-world type of problem might you need to use multiplication in order to solve it? How can quotients be estimated? How can the steps for dividing be explained? 	 Representing problems and situations mathematically can help us understand real life scenarios. Place value understanding is essential when reading, writing, modeling, comparing, rounding and computing with whole numbers. Estimation can be used to assess the reasonableness of answers 	
Areas of Focus: Proficiencies	Key Concepts and Skills	

(New Jersey Student Learning Standards)	
Students will: 4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 \div 70 = 10 by applying concepts of place value and division. 4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. 4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place. 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm 4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. 4.OA.A.1 : Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplicative comparison, e.g., by using drawings and equations. 4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison from additive comparison. 4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown	 Identify the place value of numbers through thousands. Read, write, and model numbers to thousands. Round and compare multi-digit whole numbers by value of the digits in each place. Identify the place value of numbers to one million. Compare and round multi-digit whole numbers. Add using estimation and mental math. Relate subtraction to addition. Use methods for ungrouping to subtract any size numbers. Add and subtract multi-digit numbers. Solve addition and subtraction word problems with greater numbers. To identify place value positions while calculating the 4 operations. Identify place value of a given number to make comparisons.

strategies including rounding.		
 Mathematical Practices MP. The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. MP.1. Make sense of problems and persevere in solving them. MP.2. Reason abstractly and quantitatively. MP.3. Construct viable arguments and critique the reasoning of others. MP.4. Model with mathematics. MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure. MP.8. Look for and express regularity in repeated reasoning. Career-Ready Practices CRP2: Apply appropriate academic and technical skills. CRP4: Communicate clearly and effectively and with reason. CRP8: Utilize critical thinking to make sense of problems and persevere in solving them. 		
Differentiation		Assessments
 Technology Integration Students use Chromebooks to access SAVVAS Realize platform to practice and reinforce skills and concepts. Students will use Google Classroom to access links to: interactive activities and math games. Students will access various websites, such as iReady, Reflex Math, and Splash Learn to practice and reinforce math skills. 		 Formative Assessments: Teacher Observation Individual Lesson Quick Checks Daily Classwork Homework Pages per lesson/topic Student Activity Pages per lesson/topic Summative Assessments: Topic Unit Tests 1, 2, 3, 4/ 6, and 5
Supports for English Danguage Dearners		
Sensory Supports Graphic Supports	Interactive Supports	
Real-life objects Charts	In pairs or partners	

Manipulatives	Graphic Organizers	In triands or small groups
Pictures	Tables	In a whole group
Illustrations, diagrams & drawings	Graphs	Using cooperative group
Magazines & Newspapers	Timelines	Structures
Physical activities	Number lines	Internet / Software support
Videos & Film		In the home language
Broadcasts		With mentors
Models & Figures		

Intervention Strategies		
Accommodations	Interventions	Modifications
Allow for verbal responses	Multi-sensory techniques	Modified tasks/expectations
Repeat/confirm directions	Increase task structure (e.g. directions, checks for understanding, feedback	Differentiated materials
Permit response provided via computer or electronic device	Increase opportunities to engage in active academic responding	Individualized assessment tools based on student need
Audio Books	Utilize pre-reading strategies and activities previews, anticipatory guides, and semantic mapping	Modified assessment grading

Topic: Operations and Algebraic Thinking	
<u>enVision Math 2020 Units of Study</u> Topic 7 - Factors and Multiples Topic 14- Algebra: Generate and Analyze Patterns	Recommended Texts to Support Topic: • enVision Math 2020 Resources: • • Realize Online Platform • • Student Editions
Big Ideas: Course Objectives/Content Statement(s) • Eactors multiples and patterns are sequences that are governed by a rule that allows for	
generalizations in math	
Essential Questions What provocative questions will foster inquiry, understanding, and transfer of learning?	Enduring Understandings What will students understand about the big ideas?
 How can you use arrays or multiplication to find the factors of a number? How can you identify prime and composite numbers? How can you find multiples of a number? How do I generate a number pattern by following a given rule? 	• Factors, multiples, and patterns are sequences that are governed by a rule that allows for generalizations in math
Areas of Focus: ProficienciesKey Concepts and Skills(New Jersey Student Learning Standards)Key Concepts and Skills	
	• Find all factor pairs of a given number

Find multiples of a given number

Generate patterns when given a rule

4.OA.B.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite. 4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

Mathematical Practices

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Supports for English Language Learners			
Sensory Supports	Graphic Supports	Supports	
Real-life objects	Charts	In pairs or partners	
Manipulatives	Graphic Organizers	In triands or small groups	
Pictures	Tables	In a whole group	
Illustrations, diagrams & drawings	Graphs	Using cooperative group	

Magazines & Newspapers	Timelines	Structures
Physical activities	Number lines	Internet / Software support
Videos & Film		In the home language
Broadcasts		With mentors
Models & Figures		

Intervention Strategies		
Accommodations	Interventions	Modifications
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Topic: Numbers and Operations-Fractions		
enVision Math 2020 Units of Study Topic 8 - Extend Understanding of Fraction Equivalence and Ordering Topic 9 - Understand Addition and Subtraction of Fractions Topic 10 - Extend Multiplication Concepts to Fractions Topic 12 - Understand and Compare Decimals	 Recommended Texts to Support Topic: enVision Math 2020 Resources: Realize Online Platform Student Editions 	

Big Ideas: *Course Objectives/Content Statement(s)*

- Equivalent fractions and benchmark fractions help when comparing fractions
- Adding and subtracting fractions and whole numbers
- Apply and extend previous understandings of multiplication to multiply a fraction by a whole number
- Fraction understanding can be used to read, write, and compare decimal fractions

Essential Questions What provocative questions will foster inquiry, understanding, and transfer of learning?	Enduring Understandings What will students understand about the big ideas?
 What are some ways to name the same part of a whole? How can you compare fractions with unlike numerators and denominators? How do you add and subtract fractions and mixed numbers with like denominators? How can fractions be added and subtracted on a number line? How can you describe a fractions using a unit fraction? How can you multiply a fraction by a whole number? How can you write a fraction as a decimal? How can you locate points on a number line? How do you compare decimals? 	 Fractions are numbers that represent equal parts of whole units. Equivalent fractions represent the same part of a whole. Fractions with different numerators and denominators can be compared by reasoning about their size.
Areas of Focus: Proficiencies (New Jersey Student Learning Standards)	Key Concepts and Skills
Students will: 4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. 4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model	 Develop a conceptual understanding of unit fractions and how they are used to build other fractions. Use fraction bars and number lines to represent fractions. Locate fractions on the number line. Use fraction bars and number lines to compare unit fractions. Use fraction circles to develop understanding of comparing fractions with the same denominator or with the same numerator. Develop understanding of equivalent fractions. Find two or more equivalent fractions using number lines. Use fraction concepts to solve real world problems Relate fractions to decimals Compare decimals

4.NF.B.3a: Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

4.NF.B.3b: Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples:* 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; $2 \ 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.

4.NF.B.3c: Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

4.NF.B.3d: Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.4 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.

4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.

4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that

feature a measurement scale.		
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Supports for English Languag	ge Learners	
Sensory Supports Graphic Supports	Interactive Supports	
Real-life objects Charts	In pairs or partners	

Manipulatives	Graphic Organizers	In triands or small groups
Pictures	Tables	In a whole group
Illustrations, diagrams & drawings	Graphs	Using cooperative group
Magazines & Newspapers	Timelines	Structures
Physical activities	Number lines	Internet / Software support
Videos & Film		In the home language
Broadcasts		With mentors
Models & Figures		

Intervention Strategies			
Accommodations	Interventions	Modifications	
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Audio Books	Utilize pre-reading strategies and activities previews, anticipatory guides, and semantic mapping	Modified assessment grading	

Topic: Measurement and Data		
<u>enVision Math 2020 Units of Study</u> Topic 11 - Represent and Interpret Data on Line Plots Topic 13 - Measurement: Find Equivalence in Units of Measure	Recommended Texts to Support Topic:• enVision Math 2020 Resources:• Realize Online Platform• Student Editions	
 Big Ideas: Course Objectives/Content Statement(s) Interpret data and make line plots to display da Know relative sizes of measurement units 	ita	
Essential Questions What provocative questions will foster inquiry, understanding, and transfer of learning?	Enduring Understandings What will students understand about the big ideas?	
 How can you solve problems using data on a line plot? How can you make a line plot? How can you convert from one unit to another? How can you be precise when solving math problems? 	 Data displays convey information in a concise way. Time measurement is a means to organize and structure each day and our lives. Measurements can be used to describe, compare, and make sense of phenomena. 	
Areas of Focus: Proficiencies (New Jersey Student Learning Standards)	Key Concepts and Skills	
 Students will: 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing 4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line 	 Measure lengths in inches, half inches, and quarter inches with rulers. Use customary units of liquid volume. Use metric units of liquid volume. Measure and estimate weight and mass. Solve world problems involving liquid volumes or masses using addition, subtraction, multiplication and division. Tell and write time to the minute, quarter-hour, half hour, and hour. Tell and write the time before and after the hour to the nearest minute. Find elapsed time. Solve word problems involving addition and subtraction of time intervals in minutes. Draw scaled pictographs and bar graphs and solve comparison problems using data in pictographs and bar graphs. 	

plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

4.NF.B.4c Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.B.3c--d Understand a fraction a/b with a > 1 as a sum of fractions 1/b. c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

Mathematical Practices

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the reasoni MP.4. Mod MP.5. Use MP.6. Atter MP.7. Lool MP.8. Lool repeated re Career-Ready Pro CRP2: Apply appl CRP4: Communic reason. CRP8: Utilize crit problems and pers CRP11: Use techn	ng of others. lel with mathematic appropriate tools st nd to precision. c for and make use c for and express re- asoning. actices ropriate academic a cate clearly and effec- ical thinking to ma evere in solving the cology to enhance p	es. trategically. of structure. egularity in and technical skills. ectively and with ke sense of em. productivity.	
	Differentiation		Assessments
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Sensory Supports	Graphic Supports	Interactive Supports	
Real-life objects	Charts	In pairs or partners	
Manipulatives	Graphic Organizers	In triands or small groups	
Pictures	Tables	In a whole group	
Illustrations, diagrams & drawings	Graphs	Using cooperative group	
Magazines & Newspapers	Timelines	Structures	
Physical activities	Number lines	Internet / Software support	

Videos & Film		In the home language
Broadcasts		With mentors
Models & Figures		
In	tervention Strateg	gies
Accommodations	Interventions	Modifications
Allow for verbal responses	Multi-sensory techniques	Modified tasks/expectations
Repeat/confirm directions	Increase task structure (e.g. directions, checks for understanding, feedback	Differentiated materials
Permit response provided via computer or electronic device	Increase opportunities to engage in active academic responding	Individualized assessment tools based on student need
Audio Books	Utilize pre-reading strategies and activities previews, anticipatory guides, and semantic mapping	Modified assessment grading

Topic: Geometry			
<u>enVision Math 2020 Units of Study</u> Topic 15 - Geometric Measurement: Understand Concepts of Angles and Angle Measurement Topic 16 - Lines, Angles, and Shapes	Recommended Texts to Support Topic:• enVision Math 2020 Resources:• Realize Online Platform• Student Editions		
Big Ideas: Course Objectives/Content Statement(s)			

Understand Concepts of Angles and Angle Measurement
Describe, analyze, compare, and classify 2-D shapes

Essential Questions What provocative questions will foster inquiry, understanding, and transfer of learning?	Enduring Understandings What will students understand about the big ideas?
understanding, and transfer of tearning!	

 What are some common geometric terms? How can you measure angles? How can you classify triangles and quadrilaterals? What is line symmetry? 	 Angles are made up of different components and are measured in whole degrees Angles are additive and can be comprised of smaller angles to create a larger angle Two dimensional shapes can belong to more than one category based on their attributes. Geometry offers ways to interpret and compare real-world objects. Everyday objects have a variety of attributes and can be measured in many ways.
Areas of Focus: Proficiencies (New Jersey Student Learning Standards)	Key Concepts and Skills
 Students will: 4.G.A.1: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. 4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines 4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. 4.MD.C.5a-b Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one degree angle," and can be used to measure angles. b. An angle that turns through n one-degree angles is said to have an angle measure of n degrees. 4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the 	 Understanding the different components of an angle Measure angles in whole number degrees Recognize angles as additive and find missing angle measurements Understand the relationship among angles, triangles, and polygons. Explore the relationships among parallelograms, rectangles, squares, rhombuses, and trapezoids. Draw quadrilaterals. Describe the relationships among various types of quadrilaterals and draw quadrilaterals that match a description.

parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	
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Sensory Supports	Graphic Supports	Interactive Supports
Real-life objects	Charts	In pairs or partners
Manipulatives	Graphic Organizers	In triands or small groups
Pictures	Tables	In a whole group
Illustrations, diagrams & drawings	Graphs	Using cooperative group
Magazines & Newspapers	Timelines	Structures
Physical activities	Number lines	Internet / Software support
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Broadcasts		With mentors
Models & Figures		

Intervention Strategies			
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