MARLBORO CENTRAL SCHOOL DISTRICT – CURRICULUM MAP

Subject: Mathematics **Grade: 7 Accelerated**

Unit 1: Integers & Rational Numbers

Instructional Timeframe	Essential Questions	Assessment (Evidence)	Content (What Students Should Know)	Skills (What Students Should Be Able To Do)	N.Y.S. Performance Indicator	Resources
September/ October (5 Weeks)	What is an integer? What are some real life situations where integers are used? How can we represent negative and positive numbers on a vertical and horizontal number line? What real-life situations can you think of that represent opposites? How can we use properties of rational numbers to solve real-world problems?	Daily Homework Problems of the Week Quizzes/Tests Benchmark Examination #1	<u>Vocabulary</u> Integer Inverse operation Absolute value Exponent Order of operations Factor Multiple Additive Inverse Opposites Zero Pair Rational Number Commutative Property Distributive Property Associative Property Identity Properties Inverse Properties Reciprocal	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal vertical number line diagram. a) Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* b) Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c) Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d) Apply properties of operations as strategies to add and subtract rational numbers. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a) Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(–1)(–1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b) Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $–(p/q) = (–p)/q = p/(–q)$. Interpret quotients of rational numbers by describing real-world contexts. c) Apply properties of operations as strategies to multiply and divide rational numbers. d) Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. Solve real-world and mathematical problems involving the four operations with rational numbers.	7.NS.1 7.NS.2 7.NS.3	Teacher-Created Materials EngageNY Curricular Materials Supplementary Materials

MARLBORO CENTRAL SCHOOL DISTRICT – CURRICULUM MAP

Subject: Mathematics **Grade: 7 Accelerated**

Unit 2: Ratios & Proportional Relationships

Instructional Timeframe	Essential Questions	Assessment (Evidence)	Content (What Students Should Know)	Skills (What Students Should Be Able To Do)	N.Y.S. Performance Indicator	Resources
October/ November (5 Weeks)	How can we show that two ratios are equivalent? How can we identify proportional relationships in real-world applications? How can we use unit rate to compare relationships? How can we use proportional relationships to solve multi-step problems? How can we convert rates using different units of measure?	Daily Homework Problems of the Week Quizzes/Tests Benchmark Examination #1	<u>Vocabulary</u> Ratio Rate Unit Rate Equivalent Ratio Proportional Relationship Constant of Proportionality One-to-One Correspondence Scale Drawing Scale Factor Origin Complex Fraction	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.* Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	7.RP.1 7.RP.2 7.RP.3 7.G.1	Teacher-Created Materials EngageNY Curricular Materials Supplementary Materials

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Subject: Mathematics **Grade: 7 Accelerated**

Unit 3: Expressions & Equations

Instructional Days	Essential Questions	Assessment (Evidence)	Content (What Students Should Know)	Skills (What Students Should Be Able To Do)	N.Y.S. Performance Indicator	Resources
December/ January (7 Weeks)	Why is it useful to translate real world situations into algebraic expressions and equations? What makes an expression different from an equation? What makes an equation different from an inequality? Why is it useful to translate real world situations into algebraic inequalities? When are formulas useful in real world situations? What are some real-life applications for finding the area and circumference of a circle? How are properties used to solve equations? How can we use variables to represent unknown quantities when creating expressions, equations, and inequalities	Daily Homework Problems of the Week Quizzes/Tests Benchmark Examination #2	Vocabulary Term Expression Equation Inverse operation Proportion Cross product Sum Total More than Difference Less than Product Quotient Equivalent Expression Inequality Greater than (or equal to) Less than (or equal to) Open circle Closed circle Formula Expanded Form Distributive Property Factored Form Standard Form Coefficient Circle Diameter Radius Circumference	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."* Solve multi-step real-life and mathematical problems Posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Solve real-world and mathematical problems involving the four operations with rational numbers. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	7.EE.1 7.EE.2 7.EE.3 7.EE.4 7.NS.2 7.NS.3 7.G.4	Teacher-Created Materials EngageNY Curricular Materials Supplementary Materials

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Subject: Mathematics **Grade: 7 Accelerated**

Unit 4: Percents & Proportional Relationships

Instructional Days	Essential Questions	Assessment (Evidence)	Content (What Students Should Know)	Skills (What Students Should Be Able To Do)	N.Y.S. Performance Indicator	Resources
February/ March (4 Weeks)	How can our knowledge of the percent proportion help us solve real-world problems? How can we use our knowledge of scale factors to find unknown lengths of actual and scaled figures? How can we use unit pricing along with percent applications to analyze and make informed consumer decisions?	Daily Homework Problems of the Week Quizzes/Tests Benchmark Examination #3	<u>Vocabulary</u> Constant of Proportionality Complex Fraction Sales Tax Commission Unit Rate Scale Factor Scale Drawing Discount Markdown Sales Price Markup Price Gratuities Interest Principal Value Original Price Percent Error Percent Increase Percent Decrease	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour equivalently 2 miles per hour.* Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. Use proportional relationships to solve multistep ratio and percent problems Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.* Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	7.RP.1 7.RP.2 7.RP.3 7.EE.3 7.G.1	Teacher-Created Materials EngageNY Curricular Materials Supplementary Materials

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Unit 5: Statistics & Probability

Instructional Days	Essential Questions	Assessment (Evidence)	Content (What Students Should Know)	Skills (What Students Should Be Able To Do)	N.Y.S. Performance Indicator	Resources
March/ April (3 Weeks)	What are some real-world applications for finding the mean, median, mode, and range of a set of numbers? When is it useful to use the Fundamental Counting Principle in real-world situations? What is the difference between theoretical and experimental probabilities? What is the difference between dependent and independent probabilities? How do we determine the probabilities for compound events? How can we conduct a survey without bias? How can we compare two sample populations?	Daily Homework Problems of the Week Quizzes/Tests Benchmark Examination #4	<u>Vocabulary</u> Mean Median Mode Range Outlier Histogram Misleading graph Proportion Interval Scale Fundamental Counting Principle Tree diagram Compound probability Theoretical probability Experimental probability Independent probability Dependent probability Conditional probability Survey Bias Likelihood Chance Frequency Random Samples Population Variation Variability	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* 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. 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. Display numerical data in plots on a number line, including dot plots, histograms, and box plots. Summarize numerical data sets in relation to their context, such as by: a) Reporting the number of observations. b) Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 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. 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. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling word from the book; predict the winner of a school election based on random sampled survey data. Gauge how far off the estimate or prediction might be.* Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean*	6.SP.1 6.SP.2 6.SP.3 6.SP.4 6.SP.5 7.SP.1 7.SP.2 7.SP.3	Teacher-Created Materials EngageNY Curricular Materials Supplementary Materials

				absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.		
				Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*	7.SP.4	
				Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely even, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	7.SP.5	
				Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*	7.SP.6	
				Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	7.SP.7	
				Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	7.SP.8	

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Unit 6: Linear Functions & Geometric Relationships

Instructional Days	Essential Questions	Assessment (Evidence)	Content (What Students Should Know)	Skills (What Students Should Be Able To Do)	N.Y.S. Performance Indicator	Resources
May/June (6 Weeks)	Where do you see angle relationships in the real world? How can we model angle relationships using algebraic equations? How can we find unknown angle measurements using a variety of angle properties? What are the defining characteristics of a linear relationship? What are real-life applications for slopes of linear functions? How can we model real-world situations using systems of equations? How can we determine the number of solutions that a system of equations has by inspection?	Daily Homework Problems of the Week Quizzes/Tests Benchmark Examination #4	<u>Vocabulary</u> Line Line Segment Ray Parallel Perpendicular Complementary Angles Supplementary Angles Vertical Angles Adjacent Angles Alternate Interior/Exterior Angles Angle Sum of a Triangle Exterior Angle of a Triangle Remote Interior Angles Slope System of Linear Equations Solution to a System of Equations Coefficient Equation Like Terms Linear Equation Term Unit Rate Variable	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so. Identify a variety of different types of angles within a given geometric diagram,and the mathematical attributes of those angle relationships. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. Use similar triangles to explain why the slope, m, is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b. Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.* c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*	8.G.5 8.EE.5 8.EE.6 8.EE.7 8.EE.8	Teacher-Created Materials EngageNY Curricular Materials Supplementary Materials