Seventh Grade Math Matrix

Unit Name	Module	Lessons	Vocabulary
UNIT 1 – THE NUMBER SYSTEM			
7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. Represent addition and subtraction on a horizontal or vertical number line. **7.NS.1b** . Understand addition of rational numbers; p + q is 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. **7.NS.1c** 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. **7.NS.1d** Apply properties of operations as strategies to add and subtract rational numbers. **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers. **7.EE.3** Solve multi-step real-world 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. Assess the reasonableness of answers using mental computation and estimation strategies.	**1 - ADDING AND SUBTRACTING INTEGERS**	**1.1 - 1.4**	Difference Integers negative number opposites positive number sum whole number absolute value additive inverse expression model number line gain/loss earn/spend withdraw/deposit ascend/descend above/below sea level

7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.2a** 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. **7.NS.2b** 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 –($pp\ qq$) = $-pp\ qq$ = $pp\ -qq$. Interpret quotients of rational numbers by describing real-world contexts. **7.NS.2c** Apply properties of operations as strategies to multiply and divide rational numbers. **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers. **7.EE.3** Solve multi-step real-world 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. Assess the reasonableness of answers using mental computation and estimation strategies.	**2 - MULTIPLYING AND DIVIDING INTEGERS**	**2.1 - 2.3**	Divide Dividend Divisor Integers Multiply Operation Product Quotient

7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. Represent addition and subtraction on a horizontal or vertical number line. **7.NS.1a** Describe situations in which opposite quantities combine to make 0. **7.NS.1b** Understand addition of rational numbers; p + q is 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. **7.NS.1c** 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. **7.NS.1d** Apply properties of operations as strategies to add and subtract rational numbers. **7.NS.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.2a** 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. **7.NS.2b** 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 –($pp\ qq$) = $-pp\ qq = pp\ -qq$. Interpret quotients of rational numbers by describing real-world contexts **7.NS.2c** . Apply properties of operations as strategies to multiply and divide rational numbers. **7.NS.2d** . Convert a fraction to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers. **7.EE.3** Solve multi-step real-world 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. Assess the reasonableness of answers using mental computation and estimation strategies.	**3 - RATIONAL NUMBERS**	**3.1 - 3.6**	Pattern Whole numbers Rational number Repeating decimal Terminating decimal Fraction Improper fraction Mixed number

UNIT 2 – RATIOS AND PROPORTIONAL REASONING			
7.RP.1 Compute unit rates associated with ratios of fractions **7.RP.2** Recognize and represent proportional relationships between quantities **7.RP.2a** Decide whether two quantities are in a proportional relationship. **7.RP.2b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships **7.RP.2c** Represent a proportional relationship using an equation **7.RP.2d** 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. **7.RP.3** Use proportional relationships to solve multistep ratio and percent problems. **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers.	**4 – RATES AND PROPORTIONALITY**	**4.1 - 4.3**	Constant Conversion factor Equivalent ratios Percent Rate Ratio Complex fraction Constant of proportionality Proportion Proportional relationship Rate of change Unit rates Linear Origin
7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. **7.EE.2** Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related. **7.EE.3** Solve multi-step real-world 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. Assess the reasonableness of answers using mental computation and estimation strategies.	**5 – PROPORTIONS AND PERCENT**	**5.1 - 5.3**	Percent decrease Percent increase Principal Simple interest
INTERIM ASSESSMENT #1 (11/27-11/28)	MODULES 1-5		

UNIT 3 – EXPRESSIONS, EQUATIONS, AND INEQUALITIES			
7.EE.1 Add, subtract, factor, and expand linear expressions with rational coefficients by applying the properties of operations. **7.EE.2** Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related **7.EE.4** Use variables to represent quantities in a realworld or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **7.EE.4a** Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are rational numbers and x represents the unknown quantity. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.	**6 – EXPRESSIONS AND EQUATIONS**	**6.1 - 6.4**	Algebraic expression Distributive property Equation Factor Solution Variable
7.EE.4 Use variables to represent quantities in a realworld or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities **7.EE.4a** Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are rational numbers and x represents the unknown quantity. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. **7.EE.4b** Solve word problems leading to inequalities of the form px + q > r, px + q ≥ r, px + q ≤ r, or px + q < r, where p, q, and r are rational numbers and x represents the unknown quantity. Graph the solution set of the inequality on the number line and interpret it in the context of the problem.	**7 - INEQUALITIES**	**7.1 - 7.3**	Constant Greater than Inequality Less than

UNIT 4 GEOMETRY			
7.RP.2 Recognize and represent proportional relationships between quantities. **7.RP.3** Use proportional relationships to solve multistep ratio and percent problems. **7.G.1** Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	**8 – MODELING GEOMERTIC FIGURES**	**8.1**	Dimension Length Proportion Polygon Width Cross section Scale Scale drawing
7.RP.2a Decide whether two quantities are in a proportional relationship. **7.G.4** Apply the formulas for the area and circumference of a circle to solve problems. **7.EE.2** Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related.	**9 – CIRCUMFERENCE, AREA, AND VOLUME**	**9.1 - 9.2**	Area Perimeter Circumference Diameter Radius PI

UNIT 5 - STATISTICS			
7.SP.1 Construct and interpret box-plots, find the interquartile range and determine if a data point is an outlier. **7.SP.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be. **7.RP.2c** Represent a proportional relationship using an equation.	**10 – RANDOM SAMPLES AND POPULATIONS**	**10.1 - 10.2**	Box plot Data Dot plot Interquartile range Lower quartile Median Spread Survey Upper quartile Biased sample Population Random sample Sample
7.SP.3 Informally assess the degree of visual overlap of two quantitative data distributions. **7.SP.4** Use measures of center and measures of variability for quantitative data from random samples or populations to draw informal comparative inferences about the populations.	**11 – ANALYZING AND COMPARING DATA**	**11.1 - 11.3**	Mean Measure of center Measure of spread Mean absolute deviation (MAD)
INTERIM ASSESSMENT #2 (2/27-2/28)	**MODULES 6-11**		

UNIT 6 - PROBABILITY			
7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. **7.SP.6** Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times. **7.SP.7a** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. **7.SP.7b** Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies? **7.SP.8** Find probabilities of compound events using organized lists, sample space tables, tree diagrams, and simulation. **7.SP.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs **7.SP.8b** Represent sample spaces for compound events using methods such as organized lists, sample space tables and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event. **7.SP.8c** Design and use a simulation to generate frequencies for compound events. **7.RP.3** Use proportional relationships to solve multistep ratio and percent problems. **7.NS.3** Solve real-world and mathematical problems involving the four operations with rational numbers.	**12 – EXPERIMENTAL PROBABILITY**	**12.1 - 12.4**	Observation Complement Compound event Event Experiment Experimental probability Outcome Probability Simple event Simulation Trial

7.SP.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times. **7.SP.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. **7.SP.7a** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected. **7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **7.SP.8a** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. **7.SP.8b** . Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event **7.SP.8c** Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood? **7.RP.3** Use proportional relationships to solve multistep ratio and percent problems.	**13 – THEORETICAL PROBABILITY**	**13.1 - 13.4**	Theoretical probability
NYS CC ASSESSMENT PREP (NYS CC ASSESSMENT 5/1-5/2)			

UNIT 4 - GEOMETRY			
7.G.2 Draw triangles when given measures of angles and/or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **7.G.3** Describe the two-dimensional shapes that result from slicing three-dimensional solids parallel or perpendicular to the base. **7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. **7.EE.4a** Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are rational numbers and x represents the unknown quantity. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.	**8 – MODELING GEOMETRIC FIGURES**	**8.3 - 8.4**	Angle Degree Adjacent angles Complementary angles Congruent angles Cross section Intersection Supplementary angles Vertical angles
7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of twoand three-dimensional objects composed of triangles, trapezoids, parallelograms, cubes, and right rectangular prisms. **7.EE.2** Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related	**9 – CIRCUMFERENCE, AREA, AND VOLUME**	**9.3 - 9.5**	Parallelogram Prism Rectangle Square Trapezoid Triangle Volume Composite figures