William G. Rohrer Middle School
Course Overview

Subject: Mathematics
Course: Math 7

Summary: Math 7 focuses on four critical areas: (1) developing an understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

Unit Title	Student Learning Targets	Standards	Resources	Assessment
Unit 1: The Real Number System	**Learners will demonstrate the ability to:** ● Add and subtract positive and negative rational numbers ● Model addition and subtraction using number lines ● Multiply and divide positive and negative rational numbers ● Apply knowledge of operations with rational numbers to solve real-world and problem situation.	**7.NS.1 –** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7.NS.2 –** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.3 –** Solve real-world and mathematical problems involving the four operations with rational numbers.	iPads Number Lines Pattern Blocks Program Resources	Standard Check(s) Mastery Assessment(s)

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Unit 2: Proportional Relationships	**Learners will demonstrate the ability to:** ● Calculate unit rates ● Use ratios and unit rates to represent relationships between lengths, areas, and other quantities. ● Determine if two ratios are proportional ● Represent proportional relationships ● Use ratios and proportions to create scale drawings ● Use ratios and proportions to calculate lengths and areas related to scale drawings ● Apply knowledge of ratios and proportions to solve real-world and mathematical problems.	**7.RP.1 –** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. **7.RP.2 –** Recognize and represent proportional relationships between quantities. **7.RP.3 –** Use proportional relationships to solve multi-step 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.	iPads Program Resources	Standard Check(s) Mastery Assessment(s)
Unit 3: Algebraic Expressions and Equations	**Learners will demonstrate the ability to:** ● Simplify algebraic expressions using the properties of operations ● Expand algebraic expressions ● Apply the distributive property to algebraic expressions ● Use algebraic expressions and equations to model real-world and mathematical problems	**7.EE.1 –**Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **7.EE.2 –** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.	iPad Color Tiles Pattern Blocks Geometry Software Program Resources	Standard Check(s) Mastery Assessment(s)

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	● Solve multi-step real world and mathematical problems by applying knowledge of operations with rational numbers ● Apply knowledge of algebraic expressions and equations to solve real-world and mathematical problems ● Assess the reasonableness of solutions in the context of a real-world problem ● Convert between various forms of rational numbers as appropriate in the given context of the problem ● Apply knowledge of angle relationships to solve real-world and mathematical problems	**7.EE.3 –** Solve multi-step real-world and mathematical problems posed with positive and negative rational numbers in any form, by using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answerers using mental computation and estimation strategies. **7.EE.4 –** Use variables to represent quantities in real-world or mathematical problems, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **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.		
Unit 4: Geometry	**Learners will demonstrate the ability to:** ● Calculate the area and circumference of a circle	**7.G.4 –** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	iPad 3D Figure Models	Standard Check(s) Mastery Assessment(s)

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	● Describe the relationship between the area of a circle and its circumference ● Apply knowledge of area to solve real-world and mathematical problems ● Apply knowledge of volume of three-dimensional figures to solve real-world and mathematical problems ● Apply knowledge of surface area to solve real-world and mathematical problems ● Construct triangles given the side lengths ● Construct triangles given the angle measures ● Determine the number of figures created based on given conditions ● Identify and describe the cross sections of three-dimensional figures	**7.G.6 –** Solve real-world and mathematical problems involving area, volume, and surface area of two- and three- dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. **7.G.2 –** Draw geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **7.G.3 –** Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	Program Resources	
Unit 5: Statistics and Probability	**Learners will demonstrate the ability to:** ● Collect data about a population using random sampling ● Make generalizations about a population from data obtained from random sampling	**7.SP.1 –** Understand that statistics can be used to gain information about a population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that	iPad Graphing Software Program Resources	Standard Check(s) Mastery Assessment(s)

	● Make inferences about populations based on data obtained from random sampling ● Generate multiple samples for a population and determine the variations in the data ● Make predictions about populations based on data obtained from random sampling ● Assess and describe the relationship between two data distributions ● Compare populations using measures of center and measures of variability ● Calculate the probability of events ● Describe the likeliness of events given their probability ● Approximate the probability of a chance event by collecting data on the chance process ● Predict the relative frequency of an event given its probability ● Develop a probability model and use it to find the probability of an event ● Compare probabilities to observed frequencies	random sampling tends to produce representative samples and support valid inferences. **7.SP.2 –** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples of the same size to gauge the variation in estimates or predictions. **7.SP.3 –** Informally assess the degree of visual overlap of two numerical data distributions with similar variability measuring the difference between the centers by expressing it as a multiple of a measure of variability. **7.SP.4 –** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. **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 $\frac{1}{2}$ indicates an event that is neither likely nor unlikely, and a probability near 1 indicates a likely event. **7.SP.6 –** Approximate the probability of a chance event be 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. **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.		