Thomaston Public Schools - Curriculum Overview and Pacing Guide

<table>
<tr><td colspan="3">Course Title: Mathematics 7</td></tr>
<tr><td>School: Thomaston High School</td><td>Grade: 7</td><td>Curriculum Pacing: 36 weeks</td></tr>
<tr><td>Unit One: Scale Drawings</td><td colspan="2">Unit Two: Introducing Proportional Relationships</td></tr>
<tr><td>Unit Pacing: 3-4 weeks</td><td colspan="2">Unit Pacing: 3-4 weeks</td></tr>
<tr><td>Unit Overview: In this unit, students study scaled copies of pictures and plane figures, then apply what they have learned to scale drawings, e.g., maps and floor plans. Students begin by looking at copies of a picture, some of which are to scale, and some of which are not. They use their own words to describe what differentiates scaled and non-scaled copies of a picture. As the unit progresses, students learn that all lengths in a scaled copy are multiplied by a scale factor and all angles stay the same. They draw scaled copies of figures. They learn that if the scale factor is greater than 1, the copy will be larger, and if the scale factor is less than 1, the copy will be smaller. They study how area changes in scaled copies of an image.</td><td colspan="2">Unit Overview: In this unit, students develop the idea of a proportional relationship out of the grade 6 idea of equivalent ratios. Proportional relationships prepare the way for the study of linear functions in grade 8. In a table of equivalent ratios, a multiplicative relationship between the pair of rows is given by a scale factor. By contrast, the multiplicative relationship between the columns is given by a unit rate. Every number in the second column is obtained by multiplying the corresponding number in the first column by one of the unit rates, and every number in the first column is obtained by multiplying the number in the second column by the other unit rate. The relationship between pairs of values in the two columns is called a proportional relationship, the unit rate that describes this relationship is called a constant of proportionality, and the quantity represented by the right column is said to be proportional to the quantity represented by the left. (Although a proportional relationship between two quantities represented by a and b is associated with two constants of proportionality, ab and ba, throughout the unit, the convention is if a and b are, respectively, in the left and right columns of a table, then ba is the constant of proportionality for the relationship represented by the table.)</td></tr>
<tr><td>Compelling Questions:

1. How do I use scale factor in creating a model?
2. How would using a scale make things easier for me?</td><td colspan="2">Compelling Questions:

1. How and when do I use proportions in my life? Why is it important that I am able to proportion things correctly and accurately?</td></tr>
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	2. How can I determine if a relationship is proportional or not?
Priority Learning Targets 1. I can determine the scale factor for a given object.(7.G.A.1) 2. I can compare angle measures in an original model to a scaled copy. (7.G.A.1) 3. I can construct an argument from evidence regarding how area changes in scaled copies. (7.G.B.6)	**Priority Learning Targets** 1. I can recognize, represent, and explain proportional relationships using tables, graphs, equations, diagrams, and verbal descriptions. (7.RP.A) (7.RP..A.2) 2. I can evaluate relationships to determine proportionality. (7.RP.A)(7.RP..A.2)(7.RP.2.a) 3. I can discover the constant of proportionality given different scenarios.(7.RP..A.2.b)
Unit Three: Measuring Circles	**Unit Four: Proportional Relationships and Percentages**
Unit Pacing: 3 weeks	**Unit Pacing: 4-5 weeks**
Unit Overview: In this unit, students extend their knowledge of circles and geometric measurement, applying their knowledge of proportional relationships to the study of circles. They extend their grade 6 work with perimeters of polygons to circumferences of circles, and recognize that the circumference of a circle is proportional to its diameter, with constant of proportionality π. They encounter informal derivations of the relationship between area, circumference, and radius.	1. **Unit Overview**: In this unit, students deepen their understanding of ratios, scale factors, unit rates (also called constants of proportionality), and proportional relationships, using them to solve multi-step problems that are set in a wide variety of contexts that involve fractions and percentages.
Compelling Questions: 1. How do I calculate the perimeter of irregular shapes that include circles or parts of circles? 2. How do I calculate the area of irregular shapes that include circles or parts of circles?	**Compelling Questions:** 1. How can I determine what is a better deal when given two or more options, plans, or scenarios to choose from? 2. How do I determine a percentage or score based on fraction?

Priority Learning Targets 1. I can use circle formulas to solve problems. (7.G.B) (7.EE.B.3) 2. I can explain the relationship between the circumference and area of a circle. (7.G.B.4) 3. I can determine if circumference, radius, and area are proportional to diameter. (7.G.B.4)	**Priority Learning Targets** 1. I can solve the following types of multistep and percent problems: simple interest, taxes, markups, gratuities, commissions, and fees. (7.RP.A.3) 2. I can determine the percent of increase and/or decrease in a given situation. (7.RP.A.3) 3. I can calculate percent error. (7.RP.A.3)
Unit Five: Rational Number Arithmetic	**Unit Six: Expressions, Equations and Inequalities**
Unit Pacing: 4-5 weeks	**Unit Pacing: 5-6 weeks**
Unit Overview: The unit begins by revisiting ideas familiar from grade 6: how signed numbers are used to represent quantities such as measurements of temperature and elevation, opposites (pairs of numbers on the number line that are the same distance from zero), and absolute value. In the second section of the unit, students extend addition and subtraction from fractions to all rational numbers. They begin by considering how changes in temperature and elevation can be represented—first with tables and number line diagrams, then with addition and subtraction expressions and equations. The third section of the unit focuses on multiplication and division. It begins with problems about position, direction, constant speed, and constant velocity in which students represent quantities with number line diagrams and tables of numerical expressions with signed numbers. In the fourth section of the unit, students work with expressions that use the four operations on rational numbers, making use of structure (MP7), e.g., to see without calculating that the product of two factors is positive because the values of the factors are both negative. In the fifth section of the unit, students begin working with linear equations in one variable that have rational number coefficients. The last section of the unit is a lesson in which students use rational numbers in the context of stock-market situations, finding	**Unit Overview:** In this unit, students solve equations of the forms $px+q=r$ and $p(x+q)=r$, and solve related inequalities, e.g., those of the form $px+q>r$ and $px+q\geq r$, where p, q, and r are rational numbers. In the first section of the unit, students represent relationships of two quantities with tape diagrams and with equations, and explain correspondences between the two types of representations (MP1). In the second section of the unit, students solve equations of the forms $px+q=r$ and $p(x+q)=r$, then solve problems that can be represented by such equations (MP2).In the third section of the unit, students work with inequalities. They begin by examining values that make an inequality true or false, and using the number line to represent values that make an inequality true. In the last section of the unit, students work with equivalent linear expressions, using properties of operations to explain equivalence.

values of quantities such as the value of a portfolio or changes due to interest and depreciation.	
Compelling Questions: 1. How can I use rational numbers to represent real world situations? 2. How can I use properties of rational numbers to help me solve problems?	**Compelling Questions:** 1. How can I use a tape diagram to help me solve an equation? 2. How do I determine if an inequality is true or false?
Priority Learning Targets 1. I can explain the difference between a rational and an irrational number. (7.NS.A) 2. I can use the four operations to solve problems involving rational numbers. (7.NS.A.1.a-d) (7.NS.2a-c) 3. I can apply properties of operations to solve linear expressions with rational coefficients. (7.EE.B.3) (7.EE.B.4a)	**Priority Learning Targets** 1. I can write, solve, and interpret two-step equations using known and unknown values.(7.EE.A.1)(7.EE.A.4)(7.EE.B.4.a) 2. I can write, solve, and interpret two-step inequalities using known and unknown values.(7.EE.B.4.a) 3. I can represent the solution of an inequality graphically and algebraically. (7.EE.B.4.b)
Unit Seven: Angles, Triangles and Prisms	**Unit Eight: Probability and Sampling**
Unit Pacing: 3-4 weeks	**Unit Pacing: 4-5 weeks**
Unit Overview: In this unit, students investigate whether sets of angle and side length measurements determine unique triangles or multiple triangles, or fail to determine triangles. Students also study and apply angle relationships, learning to understand and use the terms “complementary,” “supplementary,” “vertical angles,” and “unique.” The work gives them practice working with rational numbers and equations for angle relationships. Students analyze and describe cross-sections of prisms, pyramids, and polyhedra. They understand and use the formula for the volume of a right rectangular prism, and solve problems involving area, surface area, and volume. Students should have access to their geometry toolkits so that they have an opportunity to select and use appropriate tools strategically.	**Unit Overview**:In this unit, students understand and use the terms “event,” “sample space,” “outcome,” “chance experiment,” “probability,” “simulation,” “random,” “sample,” “random sample,” “representative sample,” “overrepresented,” “underrepresented,” “population,” and “proportion.” They design and use simulations to estimate probabilities of outcomes of chance experiments and understand the probability of an outcome as its long-run relative frequency. They represent sample spaces (that is, all possible outcomes of a chance experiment) in tables and tree diagrams and as lists. They calculate the number of outcomes in a given sample space to find the probability of a given event. They consider the strengths and weaknesses of different methods for obtaining a representative sample from a given population. They generate samples from a given population, e.g., by

	drawing numbered papers from a bag and recording the numbers, and examine the distributions of the samples, comparing these to the distribution of the population. They compare two populations by comparing samples from each population.
Compelling Questions: 1. How can I use my knowledge of surface area to help a business become more profitable? 2. If I were an architect, how can I employ the different angle facts to design my buildings?	**Compelling Questions:** 1. How can data help me to understand situations and to make effective decisions? 2. Why and when are probabilities important to know and understand?
Priority Learning Targets 1. I can construct a triangle with given dimensions to determine if it is unique, can be multiple triangles, or is not a triangle. (7.G.A)(7.G.A.2) 2. I can 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.G.B.5) 3. I can solve real-world and mathematical problems involving 2-dimensional area (triangles, quadrilaterals, polygons) and 3-dimensional volume and surface area (cubes, right prisms). (7.G.B.6) (7.RP.A)	**Priority Learning Targets** 1. I can use data gathered from different sampling methods to determine validity and develop reasonable arguments. (7.SP.A.1) 2. I can use measures of center and measures of variability to draw informal inferences about two populations. (7.SP.A) 3. I can compare and contrast probability models and explain discrepancies using those probability models in order to design and investigate a simulation that will allow me to collect data to generate frequencies for compound events using sample spaces, organized lists, tables and tree diagrams. (7.SP.B)(7.SP.C)