

# Adair County Middle School

2019-2020

## 7th Grade MATH STANDARDS / PACING GUIDE

### 5 Key Skills

Module	Standard	Learning Target We are learning to.....	Window of Instruction (weeks)	Essential Vocabulary
<b>Module 1</b>  <b>Ratios and Proportional Relationships</b>	<p><b>KY.7.RP.2</b> Recognize and represent proportional relationships between quantities (MP.1, MP.2, MP.3)</p> <p>a. Decide whether two quantities represent a proportional relationship.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams and verbal descriptions of proportional relationships</p> <p>c. Represent proportional relationships by equations</p> <p>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 point (0,0) and (1,r), where r is the unit rate.</p> <p><b>KY.7.EE.4</b> (MP.1, MP.4) Use variables to represent quantities in a real-world or mathematical problem and construct equations and inequalities to solve problems by reasoning about the quantities. (MP.2, MP.4)</p> <p>a. Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math> and <math>r</math> are specific rational numbers. Solve equations of these forms. Graph the solution set of the equality and interpret it in context of the problem.</p> <p><b>KY.7.RP.1</b> (MP.2, MP.6) Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</p> <p><b>KY.7.RP.3</b> Use percents to solve mathematical and real-world problems. (MP.5, MP.6)</p> <p><b>KY.7.EE.4</b> Use variables to represent quantities in a real-world or mathematical problem and construct equations and inequalities to solve problems by reasoning about the quantities. (MP.2, MP.4)</p> <p>a. Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math> and <math>r</math> are specific rational numbers. Solve equations of these forms. Graph the solution set of the equality and interpret it in context of the problem.</p> <p><b>KY.7.RP.2</b> Recognize and represent</p>	<p><b>Compute unit rates with ratios of fractions</b></p> <p><b>Recognize proportional relationships from tables and graphs</b></p> <p><b>Identify the constant of proportional relationships from tables and graphs</b></p> <p><b>Write an equation to represent a proportional relationship</b></p> <p><b>Explain the context of a point on a proportional graph</b></p>	<p><b>Weeks 1-6</b></p> <p><b>*one extra week accounted for MAP testing</b></p>	<p><b>Constant of proportionality</b></p> <p><b>Equivalent ratio</b></p> <p><b>Proportion</b></p> <p><b>Proportional relationship</b></p> <p><b>Ratio</b></p> <p><b>Unit rate</b></p>

	<p>proportional relationships between quantities (MP.1, MP.2, MP.3)</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p><b>KY.7.G.1</b> (MP.1, MP.2, MP.5) 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.</p>			
<p><b>Module 2</b></p> <p><b>Rational Numbers</b></p>	<p><b>KY.7.NS.1</b> (MP.2, MP.4, MP.7) Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represents addition and subtraction on a horizontal and vertical number line diagram.</p> <p>a. Describe situations in which opposite quantities combine to make 0.</p> <p>b. Understand <math>p + q</math> as the number located a distance <math> q </math> from <math>p</math>, in the positive or negative direction depending on whether <math>q</math> 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.</p> <p>c. Understand subtraction of rational numbers as adding the additive inverse, <math>p - q = p + (-q)</math>. 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.</p> <p>d. Apply properties of operations as strategies to add and subtract rational numbers.</p> <p><b>KY.7.NS.2</b> Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. (MP.2, MP.7, MP.8)</p> <p>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 <math>(-1)(-1)=1</math> and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>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 <math>p</math> and <math>q</math> are integers, then <math>-(p,q)=(-p)/q=p/(-q)</math>. Interpret quotients of rational numbers by describing real-world contexts.</p> <p>c. Apply properties of operations as strategies to multiply and divide rational numbers.</p>	<p><b>Describe situations in which opposite quantities combine to make zero</b></p> <p><b>Add positive and negative whole numbers</b></p> <p><b>Subtract integers by rewriting the opposite inverse</b></p> <p><b>Add and subtract rational numbers</b></p> <p><b>Multiply using the rules for signed numbers</b></p> <p><b>Multiply and divide rational numbers</b></p> <p><b>Convert fractions to decimals using long division</b></p> <p><b>Solve real-world and math problems using all operations with rational numbers</b></p>	<p><b>Weeks 7-12</b></p>	<p><b>Absolute value</b></p> <p><b>Additive inverse</b></p> <p><b>Integers</b></p> <p><b>Opposites</b></p> <p><b>Rational number</b></p> <p><b>Repeating decimal</b></p> <p><b>Terminating decimal</b></p>

	<p><b>d.</b> Convert a rational number to a decimal number using long division; know that the decimal form of a rational number terminates in zeros or eventually repeats.</p> <p><b>KY.7.NS.3</b> (MP.1, MP.2, MP.5) Solve real-world and mathematical problems involving four operations with rational numbers.</p> <p><b>KY.7.EE.2</b> (MP.7, MP.8) Understand that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related.</p> <p><b>KY.7.EE.4</b> Use variables to represent quantities in a real-world or mathematical problem and construct equations and inequalities to solve problems by reasoning about the quantities. (MP.2, MP.4)</p> <p>a. Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math> and <math>r</math> are specific rational numbers. Solve equations of these forms. Graph the solution set of the equality and interpret it in context of the problem.</p>			
<p><b>Module 3</b></p> <p><b>Expressions and Equations</b></p>	<p><b>KY.7.EE.1</b> (MP.2, MP.3) Apply properties of operations as strategies to add, subtract, factor and expand linear expressions with rational coefficients.</p> <p><b>KY.7.EE.2</b> Understand that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related.</p> <p><b>KY.7.NS.3</b> (MP.1, MP.2, MP.5) Solve real-world and mathematical problems involving four operations with rational numbers.</p> <p><b>KY.7.EE.4</b> Use variables to represent quantities in a real-world or mathematical problem and construct equations and inequalities to solve problems by reasoning about the quantities. (MP.2, MP.4)</p> <p>a. Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math> and <math>r</math> are specific rational numbers. Solve equations of these forms. Graph the solution set of the equality and interpret it in context of the problem.</p> <p>b. Solve word problems leading to inequalities of the form <math>px + q &gt; r</math>, <math>px + q &lt; r</math>, <math>px + q \geq r</math>, <math>px + q \leq r</math>; where <math>p</math>, <math>q</math> and <math>r</math> are specific rational numbers. Graph the solution set of the inequality and interpret it in context of the problem.</p> <p><b>KY.7.G.5</b> (MS. 3, MS. 6, MS. 7) Apply properties of supplementary, complementary, vertical and adjacent angles in a multiple step problem to write and solve simple equations for an unknown angle in a figure.</p>	<p><b>Combine like terms to simplify expressions</b></p> <p><b>Apply the distributive property to simplify an expression</b></p> <p><b>Add and subtract expressions</b></p> <p><b>Identify equivalent expressions</b></p> <p><b>Convert between fractions, decimals, and percents to solve problems</b></p> <p><b>Solve 2-step and distributive property equations</b></p> <p><b>Write equations to solve real-world problems</b></p> <p><b>Solve a 2-step inequality and graph it on a number line</b></p> <p><b>Write inequalities to solve real-world problems</b></p>	<p><b>Weeks 13-18</b></p>	<p><b>Coefficient</b> <b>Constant</b> <b>Distributive property</b> <b>Equation</b> <b>Expression</b> <b>Greatest common factor (GCF)</b> <b>Inequality</b> <b>Like terms</b> <b>Solution</b> <b>Variable</b></p>

	<p><b>KY.7.G.4</b> Use formulas for area and circumference of circles and their relationships. (MP.1, MP.2, MP.8)</p> <p><b>KY.7.G.6</b> (MS. 3, MS. 4, MS. 5) Solve problems involving area of two dimensional objects and surface area and volume of three dimensional objects.</p> <p>a. Solve real-world and mathematical problems involving area of two-dimensional objects composed of triangles, quadrilaterals and other polygons.</p> <p>b. Solve real-world and mathematical problems involving area and surface area, using nets as needed, of three-dimensional objects including cubes, pyramids and right prisms.</p>			
<p><b>Module 4</b></p> <p><b>Percent and Proportional Relationships</b></p>	<p><b>KY.7.RP.1</b> (MP.2, MP.6) Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</p> <p><b>KY.7.RP.2</b> Recognize and represent proportional relationships between quantities (MP.1, MP.2, MP.3)</p> <p>c. Represent proportional relationships by equations</p> <p><b>KY.7.RP.3</b> Use percents to solve mathematical and real-world problems. (MP.5, MP.6)</p> <p><b>KY.7.RP.1</b> (MP.2, MP.6) Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</p> <p><b>KY.7.RP.2</b> Recognize and represent proportional relationships between quantities (MP.1, MP.2, MP.3)</p> <p>a. Decide whether two quantities represent a proportional relationship.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams and verbal descriptions of proportional relationships</p> <p>c. Represent proportional relationships by equations</p> <p>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 point (0,0) and (1,r), where r is the unit rate.</p> <p><b>KY.7.RP.3</b> Use percents to solve mathematical and real-world problems. (MP.5, MP.6)</p> <p>a. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, a part and a percent, given two of these.</p> <p>b. Use proportional relationships to solve multistep ratio and percent problems.</p> <p><b>KY.7.EE.3</b> (MP.1, MP.4, MP.6) Solve real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply</p>	<p><b>Calculate discounts, markups, sale price, and original price</b></p> <p><b>Calculate the percent of change</b></p> <p><b>Calculate simple interest</b></p> <p><b>Identify scale factor and use it to determine a missing side</b></p>	<p><b>Weeks 18-23</b></p>	<p><b>Commission</b> <b>Corresponding Discount</b> <b>Markup</b> <b>Percent change</b> <b>Scale</b> <b>Scale factor</b> <b>Simple interest</b> <b>Tax</b> <b>Tip/gratuuity</b></p>

	<p>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.</p> <p><b>KY.7.G.1</b> (MP.1, MP.2, MP.5) 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.</p>			
<p><b>Module 5</b></p> <p><b>Calculating Statistics and Probability</b></p>	<p><b>KY.7.SP.5</b> (MP.5, MP.6, MP.7) Describe the probability of a chance event is a number between 0 and 1, which tells how likely the event is, from impossible (0) to certain (1). A probability near 0 indicates an unlikely event, a probability around <math>\frac{1}{2}</math> indicates an event that is neither unlikely nor likely and a probability near 1 indicates a likely event.</p> <p><b>KY.7.SP.6</b> (MP.1, MP.2) 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.</p> <p><b>KY.7.SP.7</b> 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. (MP.4, MP.7, MP.8)</p> <p><b>a.</b> Develop a uniform probability model by assigning equal probability to all outcomes and use the model to determine probabilities of events.</p> <p><b>b.</b> Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.</p> <p><b>KY.7.SP.8</b> Find probabilities of compound events using organized lists, tables, tree diagrams and simulation. (MP.2, MP.4, MP.7)</p> <p><b>a.</b> Explain 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.</p> <p><b>b.</b> Represent sample spaces for compound events described in everyday language using methods such as organized lists, tables and tree diagrams.</p> <p><b>c.</b> Design and use a simulation to generate frequencies for compound events.</p> <p><b>KY.7.SP.1</b> (MP.3, MP.6) 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.</p>	<p><b>Understand that probability is a number between 0 and 1 that expresses the likelihood of an event occurring</b></p> <p><b>Describe an event as being certain, likely, as likely as not, unlikely or impossible</b></p> <p><b>Use probability to predict the number of times an event will occur</b></p> <p><b>Determine the probability of an event occurring</b></p> <p><b>Determining the probability of a compound event occurring</b></p> <p><b>Represent possible outcomes using a table, tree, or list</b></p>	<p><b>Weeks 23-29</b></p>	<p><b>Compound event</b></p> <p><b>Experimental probability</b></p> <p><b>Likelihood</b></p> <p><b>Probability</b></p> <p><b>Sample space</b></p> <p><b>Simple event</b></p> <p><b>Theoretical probability</b></p> <p><b>Tree diagram</b></p>

	<p><b>KY.7.SP.2</b> Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. (MP.2, MP.3, MP.7)</p> <p><b>a.</b> Generate multiple samples of categorical data of the same size to gauge the variation in estimates or predictions.</p> <p><b>b.</b> Generate multiple samples (or simulated samples) of numerical data to gauge the variation in estimates or predictions.</p> <p><b>c.</b> Gauge how far off an estimate or prediction might be related to a population character of interest.</p> <p><b>KY.7.SP.3</b> (MP.1, MP.5, MP.7) Describe the degree of visual overlap (and separation) from the graphical representations of two numerical data distributions (box plots, dot plots) with similar variabilities with similar contexts (same variable), measuring the difference between the centers (medians or means) by expressing this difference as a multiple of a measure of variability (interquartile range when comparing medians or the mean absolute deviation when comparing means)</p> <p><b>KY.7.SP.4</b> (MP.2, MP.5, MP.7) Calculate and use measures of center (mean and median) and measures of variability (interquartile range when comparing medians and mean absolute deviation when comparing means) for numerical data from random samples to draw informal comparative inferences about two populations.</p>			
<p><b>Module 6</b></p> <p><b>Geometry</b></p>	<p><b>KY.7.G.5</b> 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.</p> <p><b>KY.7.G.2</b> (MP.6, MP.7) Draw (freehand, with ruler and protractor and with technology) 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.</p> <p><b>KY.7.G.3</b> (MP.5, MP.6) Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</p> <p><b>KY.7.G.6</b> (MS. 3, MS. 4, MS. 5) Solve problems involving area of two dimensional objects and surface area and volume of three dimensional objects.</p> <p><b>a.</b> Solve real-world and mathematical problems involving area of two-dimensional objects composed of triangles, quadrilaterals and other polygons.</p>	<p><b>Determine if given conditions create a unique triangle or no triangle</b></p> <p><b>Identify the 2-D shape formed by slicing a prism</b></p> <p><b>Know and use the formulas to find the area and circumference of a circle</b></p> <p><b>Describe an angle as supplementary, complementary, or vertical</b></p> <p><b>Use angle relationships to write and solve equations for a missing value</b></p> <p><b>Find the area of composite figures</b></p> <p><b>Determine the surface area of right prisms</b></p> <p><b>Determine the volume of right prisms</b></p>	<p><b>Weeks 30-36</b></p>	<p><b>Circumference</b> <b>Complementary angle</b> <b>Composite figure</b> <b>Cross-section</b> <b>Diameter</b> <b>Radius</b> <b>Supplementary</b> <b>Surface area</b> <b>Triangle inequality theorem</b> <b>Vertical angle</b> <b>Volume</b></p>

	b. Solve real-world and mathematical problems involving area and surface area, using nets as needed, of three-dimensional objects including cubes, pyramids and right prisms.			
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