



# Diocese of Greensburg Curriculum Math Grade 7

Unit	Standards	Content	Skills
<p><b>Integers</b></p>	<p><b>CCSS: Mathematics</b> <b>CCSS: Grade 7</b></p> <hr/> <p><b>The Number System</b></p> <p><b>7.NS.A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</b></p> <p>7.NS.A.1b. 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>7.NS.A.1c. 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>7.NS.A.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 <math>(-1)(-1) = 1</math> and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>7.NS.A.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 <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><b>NCTM: Mathematics</b> <b>NCTM: Grades 6 - 8</b></p> <hr/>	<ul style="list-style-type: none"> <li>• How to compare and order Integers</li> <li>• How to add, subtract, multiply, and divide integers</li> <li>• How to apply the Distributive Property</li> <li>• How to plot integer points on a number line and the coordinate plane</li> <li>• How to develop problem solving strategies</li> <li>• Absolute Value of Numbers</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Compare and order integers</li> <li>• Add, subtract, multiply and divide integers</li> <li>• Identify the absolute value of a number</li> <li>• Graph integers on a number line</li> <li>• Solve word problems involving integers</li> <li>• Solve problems using different strategies</li> </ul>

Unit	Standards	Content	Skills
	<p><b>Number &amp; Operations</b>  <b>Understand numbers, ways of representing numbers, relationships among numbers, and number systems</b></p> <p>develop meaning for integers and represent and compare quantities with them.</p> <p><b>Understand meanings of operations and how they relate to one another</b></p> <p>understand the meaning and effects of arithmetic operations with fractions, decimals, and integers;</p> <p>use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals;</p> <p><b>Compute fluently and make reasonable estimates</b></p> <p>develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use;</p> <p>develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results;</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Rational Numbers</b></p>	<p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 7</b></p> <hr/> <p><b>The Number System</b></p> <p><b>7.NS.A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</b></p> <p>7.NS.A.1. Apply and extend previous understandings of addition and subtraction to add and subtract rational</p>	<ul style="list-style-type: none"> <li>• How the properties of rational numbers can be expressed in a variety of forms.</li> <li>• Key vocabulary: <ul style="list-style-type: none"> <li>○ Unit rate</li> <li>○ ratio</li> <li>○ percent</li> <li>○ decimal</li> <li>○ rational number</li> </ul> </li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Identify and define rational numbers.</li> <li>• Compute with rational numbers being expressed in a variety of forms.</li> <li>• Recognize perfect squares and square roots incorporating estimation.</li> </ul>

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	<p>numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.A.1a. Describe situations in which opposite quantities combine to make 0.</p> <p>7.NS.A.1b. 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>7.NS.A.1c. 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>7.NS.A.1d. Apply properties of operations as strategies to add and subtract rational numbers.</p> <p>7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>7.NS.A.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 <math>(-1)(-1) = 1</math> and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p> <p>7.NS.A.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 <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>7.NS.A.2c. Apply properties of operations as strategies to multiply and divide rational numbers.</p>	<ul style="list-style-type: none"> <li>• Problem Solving Strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Review and/or apply rational number concept (basic decimal and fraction concepts)</li> <li>• Determine if a solution is appropriate.</li> <li>• Determine which problem solving strategy is the best to use for a specific problem</li> </ul>

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	<p>7.NS.A.2d. 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.</p> <p>7.NS.A.3. Solve real-world and mathematical problems involving the four operations with rational numbers.</p> <p><b>NCTM: Mathematics</b>  <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Number &amp; Operations</b>  <b>Compute fluently and make reasonable estimates</b></p> <p>develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results;</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Algebraic Expressions</b></p>	<p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 7</b></p> <hr/> <p><b>Expressions &amp; Equations</b>  <b>7.EE.A. Use properties of operations to generate equivalent expressions.</b></p> <p>7.EE.A.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p> <p>7.EE.A.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.</p> <p><b>7.EE.B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p> <p>7.EE.B.3. Solve multi-step real-life and mathematical problems posed with positive and negative rational</p>	<ul style="list-style-type: none"> <li>• How to write expressions</li> <li>• How to evaluate expressions</li> <li>• How to apply the rule for Order of Operations</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Apply properties of operations to generate equivalent expressions.</li> <li>• Translate verbal expressions to algebraic expressions and vice versa.</li> <li>• Simplify and evaluate numerical and algebraic expressions.</li> </ul>

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	<p>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.</p> <p>7.EE.B.4. 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.</p> <p>7.EE.B.4a. 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 fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.</p> <p>7.EE.B.4b. Solve word problems leading to inequalities of the form <math>px + q &gt; r</math> or <math>px + q &lt; 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 the context of the problem.</p> <p><b>NCTM: Mathematics</b>  <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Algebra</b>  <b>Represent and analyze mathematical situations and structures using algebraic symbols</b></p> <p>explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope;</p> <p>recognize and generate equivalent forms for simple algebraic expressions and solve linear equations</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		

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<p><b>Algebraic Equations</b></p>	<p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 7</b></p> <hr/> <p><b>Expressions &amp; Equations</b>  <b>7.EE.A. Use properties of operations to generate equivalent expressions.</b></p> <p>7.EE.A.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p> <p>7.EE.A.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.</p> <p><b>7.EE.B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p> <p>7.EE.B.3. 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.</p> <p>7.EE.B.4. 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.</p> <p>7.EE.B.4a. 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 fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.</p>	<ul style="list-style-type: none"> <li>• How to write Equations using variable</li> <li>• How to apply Properties of Operations</li> <li>• How to model problems using tables and graphs</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Model and solve real world and mathematical problems using multiple representations such as algebraic, graphical and using tables.</li> <li>• Solve multi-step equations or inequalities with one variable.</li> <li>• Solve and interpret multi-step real life and mathematical problems posed with positive and negative rational numbers.</li> <li>• Identify inverse operations</li> <li>• Use inverse operations to solve equations</li> </ul>

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	<p>7.EE.B.4b. Solve word problems leading to inequalities of the form <math>px + q &gt; r</math> or <math>px + q &lt; 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 the context of the problem.</p> <p><b>NCTM: Mathematics</b>  <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Algebra</b>  <b>Understand patterns, relations, and functions</b>  identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.</p> <p><b>Represent and analyze mathematical situations and structures using algebraic symbols</b>  recognize and generate equivalent forms for simple algebraic expressions and solve linear equations</p> <p><b>Use mathematical models to represent and understand quantitative relationships</b>  model and solve contextualized problems using various representations, such as graphs, tables, and equations.</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Inequalities</b></p>	<p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 7</b></p> <hr/> <p><b>Expressions &amp; Equations</b>  <b>7.EE.B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</b></p> <p>7.EE.B.4. Use variables to represent quantities in a real-world or mathematical problem, and construct</p>	<ul style="list-style-type: none"> <li>• How to use variable to construct inequalities</li> <li>• Graph and interpret the solution of inequalities</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Solve multi-step inequalities</li> <li>• Explain the solution set of an inequality</li> <li>• Graph the solution set on a number line</li> </ul>

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	<p>simple equations and inequalities to solve problems by reasoning about the quantities.</p> <p>7.EE.B.4b. Solve word problems leading to inequalities of the form <math>px + q &gt; r</math> or <math>px + q &lt; 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 the context of the problem.</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Ratios, Proportions</b></p>	<p><b>NCTM: Mathematics</b> <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Number &amp; Operations</b> <b>Understand numbers, ways of representing numbers, relationships among numbers, and number systems</b></p> <p>understand and use ratios and proportions to represent quantitative relationships;</p> <p><b>Compute fluently and make reasonable estimates</b></p> <p>develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.</p> <p><b>Algebra</b> <b>Represent and analyze mathematical situations and structures using algebraic symbols</b></p> <p>explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope;</p> <p><b>Geometry</b> <b>Use visualization, spatial reasoning, and geometric modeling to solve problems</b></p>	<ul style="list-style-type: none"> <li>• Vocabulary: Ratios, Rates, Slope</li> <li>• How to Write and Solve Proportions</li> <li>• How to solve proportions using cross products</li> <li>• How to create scale drawing models</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Compute unit rates associated with ratios of fractions.</li> <li>• Recognize and represent proportional relationships between quantities.</li> <li>• Use proportional relationships to solve multi-step ratio and percent problems.</li> <li>• Write a ratio to represent the relationship between two quantities</li> <li>• Define rate and proportion.</li> <li>• Find the missing value in a proportion using cross products and common multiplier.</li> <li>• Compare like items using unit rate.</li> <li>• Calculate missing dimensions in similar figures using proportions.</li> <li>• Apply proportions to scale drawings in word problems.</li> <li>• Determine percent of change.</li> </ul>

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	<p>draw geometric objects with specified properties, such as side lengths or angle measures;</p> <p><b>Measurement</b>  <b>Apply appropriate techniques, tools, and formulas to determine measurements</b></p> <p>solve problems involving scale factors, using ratio and proportion;</p> <p>solve simple problems involving rates and derived measurements for such attributes as velocity and density.</p> <p>Used with permission of the National Council of Teachers of Mathematics. This use does not imply endorsement of materials or validation of alignment.</p>		<ul style="list-style-type: none"> <li>Express fractions and ratios in simplest form.</li> </ul>
<p><b>Percents</b></p>	<p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 7</b></p> <hr/> <p><b>Ratios &amp; Proportional Relationships</b>  <b>7.RP.A. Analyze proportional relationships and use them to solve real-world and mathematical problems.</b></p> <p>7.RP.A.3. Use proportional relationships to solve multistep ratio and percent problems.</p> <p><b>NCTM: Mathematics</b>  <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Number &amp; Operations</b>  <b>Understand numbers, ways of representing numbers, relationships among numbers, and number systems</b></p> <p>work flexibly with fractions, decimals, and percents to solve problems;</p>	<ul style="list-style-type: none"> <li>Meaning of percents</li> <li>Relationship between fractions, decimals, percent</li> <li>Percent of a number</li> <li>Percent - Increase/Decrease</li> <li>Sales Tax</li> <li>Interest</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>Compare percents, decimals, fractions</li> <li>Write percents as decimals and fractions</li> <li>Calculate a percent of a number</li> <li>Calculate percent of increase/decrease</li> <li>Calculate sales tax</li> <li>Compute interest</li> </ul>

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	<p>compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line;</p> <p>develop meaning for percents greater than 100 and less than 1;</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Geometric Figures</b></p>	<p><b>CCSS: Mathematics</b> <b>CCSS: Grade 7</b></p> <hr/> <p><b>Geometry</b></p> <p><b>7.G.A. Draw construct, and describe geometrical figures and describe the relationships between them.</b></p> <p>7.G.A.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.</p> <p>7.G.A.2. 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>7.G.A.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.</p> <p><b>7.G.B. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p> <p>7.G.B.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.</p>	<ul style="list-style-type: none"> <li>• Geometric figures</li> <li>• Parts of Geometric figures</li> <li>• Relationships between figures</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Identify various types of lines and angles.</li> <li>• Identify geometric objects by description of its properties or attributes.</li> <li>• Classify and draw quadrilaterals and triangles by sides and angles.</li> <li>• Identify parts of a circle.</li> <li>• Construct congruent angles, bisectors, parallel, and perpendicular lines.</li> <li>• Draw geometric shapes using tools(protractor, ruler)</li> </ul>

Unit	Standards	Content	Skills
	<p><b>NCTM: Mathematics</b>  <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Geometry</b>  <b>Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships</b></p> <p>precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties;</p> <p>understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;</p> <p>create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.</p> <p><b>Specify locations and describe spatial relationships using coordinate geometry and other representational systems</b></p> <p>use coordinate geometry to represent and examine the properties of geometric shapes;</p> <p>use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides.</p> <p><b>Use visualization, spatial reasoning, and geometric modeling to solve problems</b></p> <p>draw geometric objects with specified properties, such as side lengths or angle measures;</p> <p>use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume;</p> <p>use geometric models to represent and explain numerical and algebraic relationships;</p>		

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	<p>recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Angles</b></p>	<p><b>CCSS: Mathematics</b> <b>CCSS: Grade 7</b></p> <hr/> <p><b>Geometry</b></p> <p><b>7.G.A. Draw construct, and describe geometrical figures and describe the relationships between them.</b></p> <p>7.G.A.2. 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>7.G.B. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p> <p>7.G.B.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.</p> <p>7.G.B.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.</p> <p><b>NCTM: Mathematics</b> <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Geometry</b></p> <p><b>Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships</b></p>	<ul style="list-style-type: none"> <li>• Facts about supplementary, complementary, vertical, and adjacent angles.</li> <li>• How to measure angles using protractor</li> <li>• How to construct angles</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Use a protractor to measure angles</li> <li>• Identify various types of lines and angles.</li> <li>• Construct congruent angles, bisectors, parallel, and perpendicular lines.</li> </ul>

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	<p>understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;</p> <p><b>Use visualization, spatial reasoning, and geometric modeling to solve problems</b></p> <p>draw geometric objects with specified properties, such as side lengths or angle measures;</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Area, Volume, Circumference</b></p>	<p><b>CCSS: Mathematics</b> <b>CCSS: Grade 7</b></p> <hr/> <p><b>Geometry</b></p> <p><b>7.G.A. Draw construct, and describe geometrical figures and describe the relationships between them.</b></p> <p>7.G.A.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.</p> <p><b>7.G.B. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p> <p>7.G.B.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.</p> <p>7.G.B.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.</p> <p>7.G.B.6. Solve real-world and mathematical problems involving area, volume and surface area of two- and</p>	<ul style="list-style-type: none"> <li>• Properties of Angles</li> <li>• Area of polygons</li> <li>• Area of Circles</li> <li>• Perimeter</li> <li>• Circumference</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Use properties of angle types and properties of angles formed when two parallel lines are cut by a transversal line to solve problems.</li> <li>• Solve problems involving area and circumference of a circle(s).</li> <li>• Solve mathematical problems involving area, volume and surface area of two- and three dimensional objects.</li> </ul>

Unit	Standards	Content	Skills
	<p>three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p> <p><b>NCTM: Mathematics</b> <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Geometry</b> <b>Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships</b></p> <p>understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects;</p> <p><b>Use visualization, spatial reasoning, and geometric modeling to solve problems</b></p> <p>use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume;</p> <p>recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p><b>Data and Statistics</b></p>	<p><b>NCTM: Mathematics</b> <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Algebra</b> <b>Use mathematical models to represent and understand quantitative relationships</b></p> <p>model and solve contextualized problems using various representations, such as graphs, tables, and equations.</p>	<ul style="list-style-type: none"> <li>• Vocabulary - Mean, Median, and Mode</li> <li>• How to read and create Bar and Line Graphs</li> <li>• How to read and create Stem-and-Leaf Plots</li> <li>• How to read and create Box-and-Whisker Plots</li> <li>• How to read and create Histograms</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Draw informal comparative inferences about two populations using measures of center and measures of variability.</li> <li>• Draw inferences about two populations based on random sampling concepts.</li> </ul>

Unit	Standards	Content	Skills
	<p><b>Analyze change in various contexts</b> use graphs to analyze the nature of changes in quantities in linear relationships.</p> <p><b>Data Analysis &amp; Probability</b> <b>Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them</b> formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population; select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.</p> <p><b>Select and use appropriate statistical methods to analyze data</b> find, use, and interpret measures of center and spread, including mean and interquartile range; discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.</p> <p><b>Develop and evaluate inferences and predictions that are based on data</b> use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken; make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit; use conjectures to formulate new questions and plan new studies to answer them.</p> <p>Used with permission of the National Council of Teachers of Mathematics. This use does not imply endorsement of materials or validation of alignment.</p>	<ul style="list-style-type: none"> <li>• How to display data appropriately</li> </ul>	<ul style="list-style-type: none"> <li>• Determine and approximate relative frequencies and probabilities of events.</li> <li>• Gather and record data</li> <li>• Create appropriate graphs based on data</li> <li>• Label graphs correctly and completely.</li> <li>• Construct a circle graph</li> <li>• Calculate mean, median, and mode on a given set of data.</li> </ul>

Unit	Standards	Content	Skills
<p><b>Probability</b></p>	<p><b>CCSS: Mathematics</b>  <b>CCSS: Grade 7</b></p> <hr/> <p><b>Statistics &amp; Probability</b></p> <p><b>7.SP.C. Investigate chance processes and develop, use, and evaluate probability models.</b></p> <p>7.SP.C.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.</p> <p>7.SP.C.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.</p> <p>7.SP.C.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.</p> <p>7.SP.C.7a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.</p> <p>7.SP.C.7b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.</p> <p>7.SP.C.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</p> <p>7.SP.C.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.</p>	<ul style="list-style-type: none"> <li>• Probability of independent events</li> <li>• Relative frequency</li> <li>• Probability of simple events</li> <li>• Theoretical and Experimental Probability</li> <li>• Permutations</li> <li>• Combinations</li> </ul>	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Predict the approximate relative frequency given the probability.</li> <li>• Find the probability of a simple event, including the probability of a simple event not occurring.</li> <li>• Define probability and factorials.</li> <li>• Identify permutations and combinations.</li> <li>• Use the Fundamental Counting Principle.</li> <li>• Find the probability of independent and dependent events.</li> <li>• Perform and Calculate theoretical and experimental probability.</li> <li>• Gather and record data and use to form inferences.</li> </ul>

Unit	Standards	Content	Skills
	<p>7.SP.C.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.</p> <p>7.SP.C.8c. Design and use a simulation to generate frequencies for compound events.</p> <p><b>NCTM: Mathematics</b>  <b>NCTM: Grades 6 - 8</b></p> <hr/> <p><b>Data Analysis &amp; Probability</b>  <b>Understand and apply basic concepts of probability</b></p> <p>understand and use appropriate terminology to describe complementary and mutually exclusive events;</p> <p>use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations;</p> <p>compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		

