

# Scope and Sequence

<i>Chapter Number and Title and Big Ideas / Lesson Number and Title and Topics</i>	<i>Objectives</i>	<i>Corresponding K to 12 Curriculum Standards and Learning Competencies Developed</i>	<i>Performance Tasks (for the Chapter)/ Essential Questions (for the Lesson)</i>
<b>Chapter 1 Sequences</b>			
<p><i>Big Ideas:</i></p> <ul style="list-style-type: none"> <li>• Equations such as those involving rational expressions are basic tools in solving many problems encountered in the sciences and other fields of study.</li> <li>• Variations are expressed as formulas and equations and are classified into various types. They are frequently encountered in various fields of study.</li> </ul>	<ul style="list-style-type: none"> <li>• Solve equations and word problems involving rational expressions</li> <li>• Solve problems involving variations</li> </ul>	<p><b>Content Standards</b> The learner demonstrates understanding of variation.</p> <p><b>Performance Standards</b> The learner is able to . . .</p> <ul style="list-style-type: none"> <li>• solve equations involving rational expressions; and</li> <li>• explore relationships of quantities that involve variation and solve problems involving direct, indirect, and joint variations.</li> </ul>	<p>Create a presentation in the form of tutorial videos, slide presentations, or plays that demonstrate the importance of rational equations and variations in real life.</p>

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<b>Lesson 1 Equations Involving Rational Expressions</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Solutions to Equations Involving Rational Expressions</li> <li>• Problem Solving Using Rational Equations</li> </ul>	<ul style="list-style-type: none"> <li>• Solve equations involving rational expressions</li> <li>• Solve word problems involving rational equations</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• recognizes equations that involve rational expressions.</li> <li>• solves equations involving rational expressions.</li> <li>• solves problems that use equations involving rational expressions, including those in real-life situations.</li> </ul>	<ul style="list-style-type: none"> <li>• How useful are the properties of real numbers in solving rational equations?</li> <li>• How useful are rational equations in solving word problems?</li> </ul>
<b>Lesson 2 Variations</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Types of Variations</li> </ul>	<ul style="list-style-type: none"> <li>• Define and illustrate a direct variation, an inverse variation, and a joint variation</li> <li>• Solve problems involving variations</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• recognizes relationships between two quantities that involve the following variations: (a) direct, (b) inverse, (c) joint, and (d) combination of any of these.</li> </ul>	<ul style="list-style-type: none"> <li>• In what way or ways do variations differ from each other?</li> <li>• In what way or ways are variations useful?</li> </ul>

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		<ul style="list-style-type: none"> <li>• translates statements that involve variations to (a) a table of values, (b) a mathematical equation, and (c) a graph, and vice versa.</li> <li>• identifies situations that involve quantities that vary (a) directly, (b) inversely, (c) jointly, and (d) according to a combination of any of these.</li> </ul>	
<b>Chapter 2 Radicals and Rational Exponents</b>			
<p><i>Big Ideas:</i></p> <ul style="list-style-type: none"> <li>• Simplifying radicals and expressions involving rational exponents and performing operations on them make use of the basic properties of numbers and the laws of exponents and radicals.</li> </ul>	<ul style="list-style-type: none"> <li>• Simplify radical expressions and perform operations on them</li> <li>• Simplify expressions involving rational exponents</li> <li>• Solve radical equations leading to linear equations</li> <li>• Solve word problems involving the Pythagorean Theorem</li> </ul>	<p><b>Content Standards</b></p> <p>The learner demonstrates understanding of expressions with rational exponents and involving radicals.</p> <p><b>Performance Standards</b></p> <p>The learner is able to . . .</p> <ul style="list-style-type: none"> <li>• simplify expressions with rational exponents and solve problems involving them; and</li> </ul>	<p>Formulate at least five word problems involving radicals and rational exponents fit for mathematics competitions. Simulate a mathematics contest using these problems.</p>

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<ul style="list-style-type: none"> <li>Expressions involving radicals and rational exponents are useful not only in mathematics but also in the physical sciences and other fields of study.</li> </ul>		<ul style="list-style-type: none"> <li>perform fundamental operations on expressions involving radicals and solve problems involving expressions and equations with radicals.</li> </ul>	
<b>Lesson 1 Multiplication and Division of Radical Expressions Involving Square Roots</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>Square Roots and Radical Expressions</li> <li>The Product Rule for Square Roots</li> <li>The Quotient Rule for Square Roots</li> <li>Rationalization of Denominators of Radical Expressions</li> </ul>	<ul style="list-style-type: none"> <li>Define square root</li> <li>Identify radical expressions</li> <li>Simplify expressions involving square roots</li> <li>Multiply expressions involving square roots using the Product Rule for Square Roots</li> <li>Divide expressions involving square roots using the Quotient Rule for Square Roots</li> <li>Simplify radical expressions by rationalizing the denominators</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>applies the concepts and laws involving positive integer exponents to zero, negative, and rational exponents.</li> <li>recognizes expressions with radicals.</li> <li>states and proves the laws of radicals.</li> <li>simplifies expressions with radicals using the laws of radicals.</li> <li>performs operations on expressions involving radicals.</li> </ul>	<p>How important are square roots?</p>

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<b>Lesson 2 More Operations with Radical Expressions Involving Square Roots</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Addition and Subtraction of Radical Expressions Involving Square Roots</li> <li>• Products of Radical Expressions Involving Square Roots</li> <li>• More on Rationalizing Denominators</li> </ul>	<ul style="list-style-type: none"> <li>• Add and subtract radical expressions involving square roots</li> <li>• Simplify other types of products of radicals involving square roots</li> <li>• Rationalize a denominator that is a sum or difference of two radicals</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• simplifies expressions with radicals using the laws of radicals.</li> <li>• performs operations on expressions involving radicals.</li> </ul>	<p>Why is it important to know how to combine and simplify radicals?</p>

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<b>Lesson 3 Higher Roots, Rational Expressions, and Radical Equations</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• The Principal <math>n</math>th Root of a Number</li> <li>• Roots of Perfect Powers When <math>n</math> Is Even</li> <li>• Relationships Between <math>a</math> and <math>\sqrt[n]{a^n}</math></li> <li>• Operations on Radicals Involving <math>n</math>th Roots</li> <li>• Rationalization of Denominators Involving Higher Roots</li> <li>• Addition and Subtraction of Radical Expressions Involving Higher Roots</li> <li>• Rational Exponents</li> <li>• Radical Equations Leading to Linear Equations</li> <li>• Problem Solving Using the Pythagorean Theorem</li> </ul>	<ul style="list-style-type: none"> <li>• Find the principal <math>n</math>th root of a number</li> <li>• Use the Product and Quotient Rules for <math>n</math>th Roots to simplify radicals</li> <li>• Add and subtract radicals involving higher roots</li> <li>• Understand the concept of rational exponents</li> <li>• Apply the Principle of Squaring to solve radical equations leading to linear equations</li> <li>• Solve word problems involving the Pythagorean Theorem</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• applies the concepts and laws involving positive integer exponents to zero, negative, and rational exponents.</li> <li>• simplifies expressions with rational exponents.</li> <li>• solves problems involving expressions with different exponents (integers and rational).</li> <li>• relates expressions with fractional exponents to expressions with radicals.</li> <li>• writes expressions with rational exponents as radicals and vice versa.</li> <li>• simplifies expressions with radicals using the laws of radicals.</li> <li>• performs operations on expressions involving radicals.</li> <li>• solves equations involving expressions with radicals.</li> <li>• solves problems that involve equations with radicals.</li> </ul>	<p>In what way or ways are roots of numbers useful?</p>

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<b>Chapter 3 Quadratic Equations</b>			
<p><i>Big Ideas:</i></p> <ul style="list-style-type: none"> <li>• The Standard Form of Quadratic Equations</li> <li>• Solutions of Quadratic Equations Using the Zero Product Principle</li> <li>• Solutions of Quadratic Equations by Factoring</li> </ul>	<ul style="list-style-type: none"> <li>• Define and illustrate a quadratic equation and its solution</li> <li>• Solve a quadratic equation by factoring, extracting the roots, completing the square, or using the quadratic formula</li> <li>• Solve word problems involving quadratic equations.</li> </ul>	<p><b>Content Standards</b> The learner demonstrates understanding of quadratic equations.</p> <p><b>Performance Standards</b> The learner is able to solve problems involving quadratic equations.</p>	<p>Create a problem kit that contains at least five word problems involving quadratic equations and the solutions for each.</p>

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<b>Lesson 1 Solutions of Quadratic Equations Using the Zero Product Principle and by Factoring</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• The Standard Form of Quadratic Equations</li> <li>• Solutions of Quadratic Equations Using the Zero Product Principle</li> <li>• Solutions of Quadratic Equations by Factoring</li> </ul>	<ul style="list-style-type: none"> <li>• Recognize a quadratic equation expressed in standard form</li> <li>• Express a given quadratic equation in standard form</li> <li>• Apply the Zero Product Principle in solving quadratic equations</li> <li>• Solve quadratic equations using factoring</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• recognizes quadratic equations.</li> <li>• solves quadratic equations by factoring.</li> </ul>	<p>How useful is factoring in solving quadratic equations?</p>
<b>Lesson 2 Solutions of Quadratic Equations Using the Completing-the-Square Method</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• The Square Root Property</li> <li>• Completing-the-Square Method</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the square root property</li> <li>• Solve quadratic equations using the square root property</li> <li>• Solve quadratic equations by completing the square</li> </ul>	<p>The learner solves quadratic equations by extracting square roots and completing the square.</p>	<p>How important is the square root property in solving quadratic equations?</p>

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<b>Lesson 3 Solutions of Quadratic Equations Using the Quadratic Formula</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• The Quadratic Formula and Its Derivation</li> <li>• Relationship Between the Coefficients and the Solutions of Quadratic Equations</li> <li>• Complex Numbers</li> <li>• The Discriminant of Quadratic Equations</li> </ul>	<ul style="list-style-type: none"> <li>• Derive the quadratic formula</li> <li>• Solve quadratic equations using the quadratic formula</li> <li>• Solve quadratic equations with complex numbers as solutions</li> <li>• Determine the nature of the solutions to a quadratic equation using the value of the discriminant of the quadratic equation</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• solves quadratic equations using the quadratic formula.</li> <li>• characterizes the roots of a quadratic equation using the discriminant.</li> <li>• describes the relationship between the coefficients and the roots of a quadratic equation.</li> </ul>	<p>Which is the best method to use in solving quadratic equations?</p>
<b>Lesson 4 Solutions to Other Types of Equations and Problems Involving Quadratic Equations</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Equations That Are Quadratic in Form</li> <li>• Other Equations That Lead to Quadratic Equations</li> <li>• Word Problems Involving Quadratic Equations</li> <li>• Solutions of Quadratic Inequalities</li> </ul>	<ul style="list-style-type: none"> <li>• Solve equations that are quadratic in form</li> <li>• Solve equations involving rational expressions or radicals that lead to quadratic equations</li> <li>• Solve word problems involving quadratic equations</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• solves equations transformable to quadratic equations.</li> <li>• solves problems involving quadratic equations.</li> </ul>	<p>In what way or ways are quadratic equations useful?</p>

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<b>Chapter 4 Quadratic Functions</b>			
<p><i>Big Ideas:</i> Quadratic functions are useful in modeling and analyzing relationships between two quantities.</p>	<ul style="list-style-type: none"> <li>• Define and illustrate quadratic functions</li> <li>• Determine the zeros of quadratic functions</li> <li>• Graph quadratic functions</li> <li>• Solve problems involving quadratic functions.</li> </ul>	<p><b>Content Standards</b> The learner demonstrates understanding of quadratic functions.</p> <p><b>Performance Standards</b> The learner is able to explore the concepts involving a quadratic function and its graph, and solve problems involving quadratic functions.</p>	<p>Create a portfolio of at least ten real-life word problems involving quadratic functions and their solutions.</p>
<b>Lesson 1 Zeros of Quadratic Functions</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Definition of a Quadratic Function</li> <li>• Methods for Determining the Zeros of Quadratic Functions</li> </ul>	<ul style="list-style-type: none"> <li>• Define the quadratic function <math>f(x) = ax^2 + bx + c</math></li> <li>• Determine the zeros or roots of a quadratic function by factoring, completing the square, or using the quadratic formula</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• recognizes quadratic functions.</li> <li>• differentiates between a quadratic function and a quadratic equation.</li> </ul>	<p>Is it important to know the zeros of a quadratic function? Why or why not?</p>

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<ul style="list-style-type: none"> <li>• Nature of the Zeros of Quadratic Functions</li> <li>• Derivation of the Quadratic Function Given Its Zeros</li> <li>• Sums and Products of the Zeros of Quadratic Functions</li> </ul>	<ul style="list-style-type: none"> <li>• Determine the nature of the zeros of a quadratic function given the value of its discriminant</li> <li>• Derive a quadratic function given its zeros or roots</li> <li>• Determine the sum and product of the zeros of a quadratic function</li> </ul>		

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<b>Lesson 2 Graphics of Quadratic Functions</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Quadratic Functions of the Form <math>f(x) = a(x - h)^2 + k</math></li> <li>• Parabolas</li> <li>• Effects of Changes in the Values of <math>a</math>, <math>h</math>, and <math>k</math> on the Graphs of Quadratic Functions</li> <li>• Derivation of the Quadratic Function Given a Table of Values or Its Graph</li> </ul>	<ul style="list-style-type: none"> <li>• Rewrite a given quadratic function expressed in the general form <math>y = ax^2 + bx + c</math> to the standard form <math>y = a(x - h)^2 + k</math> and vice versa</li> <li>• Determine the vertex, axis of symmetry, and the direction of the opening of the graph of a given quadratic function</li> <li>• Graph a quadratic function given its vertex, its axis of symmetry, the direction of its opening, and some of its points</li> <li>• Analyze the effects of changes in the values of <math>a</math>, <math>h</math>, and <math>k</math> in the equation <math>f(x) = a(x - h)^2 + k</math> on the graph of a quadratic function</li> <li>• Derive the quadratic function given a table of values or its graph</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• represents and describes a quadratic function using its (a) table of values, (b) graph, or (c) equation.</li> <li>• finds the domain and range of a quadratic function.</li> <li>• graphs quadratic functions and determines or describes its (a) intercepts, (b) zeros, (c) axis of symmetry, (d) maximum or minimum point, and (e) shape.</li> <li>• writes the equation of a quadratic function given (a) a table of values, (b) graph, or (c) zeros.</li> <li>• transforms the quadratic function <math>y = ax^2 + bx + c</math> into the form <math>y = a(x - h)^2 + k</math>.</li> <li>• analyzes the effects of changing the values of <math>a</math>, <math>h</math>, and <math>k</math> in the equation <math>f(x) = a(x - h)^2 + k</math> of a quadratic function on its graph.</li> </ul>	<p>How important is the graph of a function in describing its properties?</p>

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<b>Lesson 3 Applications of Quadratic Functions</b>			
<i>Topics:</i> <ul style="list-style-type: none"> <li>Minimum and Maximum Values of a Quadratic Function</li> </ul>	<ul style="list-style-type: none"> <li>Model data using quadratic functions</li> <li>Solve word problems involving quadratic functions</li> </ul>	The learner . . . <ul style="list-style-type: none"> <li>makes mathematical models to represent real-life situations using quadratic functions.</li> <li>solves problems involving quadratic functions.</li> </ul>	In what way or ways are quadratic functions useful in the real world?
<b>Chapter 5 Similarity</b>			
<i>Big Ideas:</i> <ul style="list-style-type: none"> <li>You may model many real-life structures mathematically by scaling them up or down.</li> <li>Similar figures have the same shape but may have different sizes.</li> </ul>	<ul style="list-style-type: none"> <li>Define a proportion</li> <li>State and apply the properties and laws of proportion</li> <li>Apply the fundamental theorems of proportionality to solve problems involving proportions</li> <li>State, illustrate, and explain the conditions for similarity of triangles</li> <li>Differentiate triangle similarity from triangle congruence and relate them with each other</li> </ul>	<b>Content Standards</b> The learner demonstrates understanding of triangle similarity.  <b>Performance Standards</b> The learner is able to . . . <ul style="list-style-type: none"> <li>uses the fundamental theorems of proportionality; and</li> <li>proves and uses concepts on triangle similarity, particularly on similarity of right triangles to solve problems.</li> </ul>	Design and create scale models or plans of real-life structures that involve fractals and/or similar figures.

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	<ul style="list-style-type: none"> <li>• Prove and apply the theorems on triangle similarity</li> <li>• State, prove, and apply the Pythagorean Theorem</li> <li>• Derive relationships among the sides of special right triangles</li> <li>• Formulate and solve real-life problems involving similarity, Pythagorean Theorem, and special right triangles</li> </ul>		
<b>Lesson 1 Theorems on Proportionally</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Ratio and Proportion</li> <li>• Fundamental Law of Proportion</li> <li>• Properties of Proportions</li> <li>• Proportional Segments</li> <li>• Basic Proportionality Theorem</li> </ul>	<ul style="list-style-type: none"> <li>• Define a proportion</li> <li>• State and apply the different properties of proportion</li> <li>• State and apply the Fundamental Law of Proportion</li> <li>• State and apply the definition of proportional segments to solve problems involving proportions</li> <li>• Illustrate and verify the Basic Proportionality Theorem and its converse</li> <li>• State and prove the Intercept</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• describes the proportion.</li> <li>• applies the fundamental theorems of proportionality to solve problems involving proportions.</li> </ul>	<ul style="list-style-type: none"> <li>• How do you apply the concepts of proportionality in real life?</li> <li>• How do you enlarge or reduce real-life objects and structures proportionally?</li> </ul>

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<b>Lesson 2 Theorems on Similarity</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Theorems on Similar Triangles</li> <li>• Perimeters and Areas of Similar Figures</li> </ul>	<ul style="list-style-type: none"> <li>• State, illustrate, and explain similarity between figures</li> <li>• Differentiate and relate triangle similarity and triangle congruence</li> <li>• Prove the conditions for similarity of triangles</li> <li>• Apply similarity theorems that given triangles are similar</li> <li>• Find the lengths of the sides and the measures of the angles of similar triangles</li> <li>• Solve problems that involve triangle similarity</li> </ul>	<p>The learner...</p> <ul style="list-style-type: none"> <li>• illustrates similarity of figures</li> <li>• proves the conditions for similarity of triangles: <ul style="list-style-type: none"> <li>– SAS Similarity Theorem</li> <li>– SSS Similarity Theorem</li> <li>– AA Similarity Theorem</li> <li>– right triangle similarity theorem</li> <li>– special right triangle theorems</li> </ul> </li> <li>• applies the theorems to show that given triangles are similar.</li> </ul>	<ul style="list-style-type: none"> <li>• How will you know if figures are similar?</li> <li>• What are the conditions that guarantee that two triangles are similar?</li> <li>• How are the measures of similar figures related?</li> </ul>

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<b>Lesson 3 Similarities in Right Triangles and the Pythagorean Theorem</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Similarities in Right Triangles</li> <li>• The Pythagorean Theorem</li> </ul>	<ul style="list-style-type: none"> <li>• Derive similarity properties in a right triangle</li> <li>• Prove the conditions for similarity of right triangles and special right triangles.</li> <li>• State, prove, and apply the Pythagorean Theorem in solving real-life problems</li> <li>• Apply the Pythagorean Theorem to derive relationships between the sides of an isosceles right triangle and those of a <math>30^\circ</math>-<math>60^\circ</math>-<math>90^\circ</math> triangle</li> <li>• Formulate and solve problems involving similarities in a right triangle and the Pythagorean Theorem</li> </ul>	<p>The learner...</p> <ul style="list-style-type: none"> <li>• proves the Pythagorean Theorem.</li> <li>• solves problems that involve triangle similarity and right triangles.</li> </ul>	<ul style="list-style-type: none"> <li>• How do you estimate or measure lengths using similarities in a right triangle?</li> <li>• How can you apply the Pythagorean Theorem in real-life situations?</li> </ul>

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<b>Chapter 6 Quadrilaterals</b>			
<p><i>Big Ideas:</i> Parallelograms, trapezoids, and kites have special properties that make them useful in numerous real-life structures.</p>	<ul style="list-style-type: none"> <li>• Determine the conditions that make a parallelogram a rectangle, a rhombus, or a square</li> <li>• Derive the properties of a trapezoid and a kite</li> <li>• Prove and apply theorems on special parallelograms, trapezoids, and kites</li> <li>• Use the properties of special parallelograms, trapezoids, and kites to find the measures of angles, sides, and other quantities involving quadrilaterals</li> </ul>	<p><b>Content Standards</b> The learner demonstrates understanding of quadrilaterals.</p> <p><b>Performance Standards</b> The learner is able to prove and use theorems involving quadrilaterals.</p>	<p>Design and make a kite, accompanied by a report on the materials used, procedure followed, and geometric concepts applied in making the kite.</p>

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<b>Lesson 1 Parallelograms</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Parallelograms</li> </ul>	<ul style="list-style-type: none"> <li>• Identify quadrilaterals that are parallelograms</li> <li>• Determine the conditions that make a parallelogram a rhombus, or a square</li> <li>• Prove theorems on the different kinds of parallelograms</li> <li>• Use the properties of parallelograms to find measures of angles, sides, and other quantities involving quadrilaterals</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• defines quadrilaterals that are parallelogram.</li> <li>• determines the conditions that make a quadrilateral a parallelogram.</li> <li>• uses properties to find measures of angles, sides and other quantities involving quadrilaterals.</li> <li>• proves theorems on the different kinds of parallelogram (rectangle, rhombus, square).</li> </ul>	<ul style="list-style-type: none"> <li>• How will you know if a parallelogram is a rectangle, rhombus, or square?</li> <li>• Why do people use special parallelograms in tiling and many other real-life structures?</li> </ul>

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<b>Lesson 2 Trapezoids and Kites</b>			
<i>Topics:</i> <ul style="list-style-type: none"> <li>• trapezoids</li> <li>• Kite</li> </ul>	<ul style="list-style-type: none"> <li>• Define and illustrate a trapezoid and a kite</li> <li>• Derive the properties of a trapezoid and of a kite</li> <li>• Prove the Midline Theorem</li> <li>• Prove theorems on trapezoids and kites</li> <li>• Use the properties of trapezoids and kites to find the measures of their angles and sides</li> <li>• Solve problems involving parallelograms, trapezoids, and kites</li> </ul>	The learner . . . <ul style="list-style-type: none"> <li>• proves the Midline Theorem.</li> <li>• proves theorems on trapezoids and kites.</li> <li>• solves problems involving parallelograms, trapezoids and kites.</li> </ul>	<ul style="list-style-type: none"> <li>• How do you use the geometric properties of quadrilaterals to make, design, and fly kites?</li> <li>• How are trapezoids different from other quadrilaterals such as parallelograms and kites?</li> </ul>

<i>Chapter Number and Title and Big Ideas / Lesson Number and Title and Topics</i>	<i>Objectives</i>	<i>Corresponding K to 12 Curriculum Standards and Learning Competencies Developed</i>	<i>Performance Tasks (for the Chapter)/ Essential Questions (for the Lesson)</i>
<b>Chapter 7 Trigonometry</b>			
<p><i>Big Ideas:</i></p> <ul style="list-style-type: none"> <li>• One can use trigonometric functions to solve missing values of sides or angles of triangles.</li> <li>• Some real-life problem situations can be solved by applying the concepts of trigonometric functions.</li> </ul>	<ul style="list-style-type: none"> <li>• Define the six trigonometric ratios: sine, cosine, tangent, secant, cosecant, and cotangent</li> <li>• Describe and illustrate angles of elevation and depression</li> <li>• Use trigonometric ratios to solve problems involving right triangles</li> </ul>	<p><b>Content Standards</b></p> <p>The learner demonstrates understanding of the basic concepts of trigonometry.</p> <p><b>Performance Standards</b></p> <p>The learner is able to explore the concepts of trigonometric ratios and use these to solve problems on angles of elevation and depression, and navigation.</p>	<p>Role-play or simulate real-life situations that involve the applications of trigonometry in the fields of medicine, engineering, music theory, optics, oceanography, astronomy, navigation, land surveying, computer graphics, cartography, or economics.</p>

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			Include in the presentation a detailed explanation and illustration of how the concepts of trigonometry are applied in the selected real-life scenario.
<b>Lesson 1 The Six Trigonometric Functions</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• The Unit Circle</li> <li>• Angles in Standard Position</li> <li>• Trigonometric Functions of Angles</li> <li>• Inverse Functions of Sine, Cosine, and Tangent</li> </ul>	<ul style="list-style-type: none"> <li>• Define the six trigonometric functions</li> <li>• Find the trigonometric functions of special angles</li> <li>• Define the inverse trigonometric functions</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• defines the six trigonometric ratios: sine, cosine, tangent, secant, cosecant, and cotangent.</li> <li>• finds the trigonometric ratios of special angles.</li> </ul>	<p>How are the six trigonometric functions of a given angle related?</p>

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<b>Lesson 2 Applications Involving Right Triangles</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Solutions of Right Triangles</li> <li>• Angles of Elevation and Depression</li> <li>• Surveying and Navigation</li> </ul>	<ul style="list-style-type: none"> <li>• Describe and illustrate angles of elevation and depression</li> <li>• Recognize situations that involve angles of elevation and depression</li> <li>• Solve problems that involve angles of elevation and depression</li> <li>• Use trigonometric ratios to solve problems involving right triangles</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• describes and illustrates angles of elevation and angles of depression.</li> <li>• recognizes situations that involve angles of elevation and depression.</li> <li>• solves problems that involve angles of elevation or depression.</li> <li>• uses trigonometric ratios to solve problems involving right triangles (e.g., navigation, surveying).</li> </ul>	<p>How useful are trigonometric functions in solving real-life problems?</p>

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<b>Lesson 3 Solving Oblique Triangles</b>			
<p><i>Topics:</i></p> <ul style="list-style-type: none"> <li>• Oblique Triangles</li> <li>• Law of Sines</li> <li>• Law of Cosines</li> <li>• Application Problems Involving Oblique Triangles</li> </ul>	<ul style="list-style-type: none"> <li>• Define an oblique triangle</li> <li>• State the laws of sines and cosines</li> <li>• Solve problems involving oblique triangles as applications of the laws of sines and cosines</li> </ul>	<p>The learner . . .</p> <ul style="list-style-type: none"> <li>• illustrates laws of sines and cosines.</li> <li>• solves problems involvin oblique triangles.</li> </ul>	<p>How useful are law of sines and law of cosines in solving real-life problems?</p>