

Unit Title: "Shapes and Designs"

Course: Middle School Mathematics

Subject Area: Mathematics

Time Frame: 20 days

Standards

Middle School Mathematics Standards	Sunshine State Standards Benchmarks	NCEE New Standards
<p>The student will:</p> <p>3.1 Recognize, classify, and analyze polygons.</p> <p>3.2 Explore side-angle-shape connections of triangles, squares, rectangles, and parallelograms.</p> <p>3.3 Estimate the size of angles using reference to a right angle and other benchmark angles.</p> <p>3.4 Develop strategies for solving problems involving polygons and their properties.</p>	<p>MA,B,1,3,2 The student uses concrete and graphic models to derive formulas for finding rates, distance, time, and angle measures.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none">• Identifies a protractor as a tool for measuring angles and measures angles using a protractor.• Identifies and names angles according to their measure (including acute, right, obtuse, straight).• Classifies triangles according to the measurement of their angles and according to the length of their sides.• Determines the measure of a missing angle using angle relationships. <p>MA.C.1.3.1 The student understands the basic properties of, and relationships pertaining to, regular and irregular geometric shapes in two and three</p>	<p>The student:</p> <p>M2a is familiar with assorted two- and three-dimensional objects, including squares, triangles, other polygons, circles, cubes, rectangular prisms, pyramids, spheres, and cylinders.</p> <p>M2c identifies three-dimensional shapes from two-dimensional perspectives; draws two-dimensional sketches of three-dimensional objects that preserve significant features.</p> <p>M2f Analyzes and generalizes geometric patterns such as tessellations and sequences of shapes.</p>

Middle School Mathematics Standards	Sunshine State Standards Benchmarks	NCEE New Standards
	<p>dimensions.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Identifies, draws, and uses symbolic notation to denote the attributes of two-dimensional geometric figures (including points, parallel and perpendicular lines, planes, rays, and parts of a circle). • Knows and draws angles (including acute, obtuse, right, and straight). • Analyzes relationships among two-dimensional geometric figures. • Knows the attributes of and draws three-dimensional figures. • Knows the properties of two- and three-dimensional figures. <p>MA.C.2.3.2 The student predicts and verifies patterns involving tessellations (a covering of a plane with congruent copies of the same pattern with no holes and overlaps, like floor tiles).</p> <p><i>Expectations</i> Content addressed at grade 8.</p> <p>MA.C.3.3.1 The student represents and applies geometric properties and relationships to solve real-world and mathematical problems.</p> <p><i>Expectations</i></p>	

Middle School Mathematics Standards	Sunshine State Standards Benchmarks	NCEE New Standards
	<p>The student:</p> <ul style="list-style-type: none"> • Observes, explains, and makes conjectures regarding geometric properties and relationships (among angles, triangles, squares, rectangles, parallelograms). • Applies known geometric properties to solve real-world and mathematical problems. 	

Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
<p>Students will understand</p> <ul style="list-style-type: none"> The patterns and regularities in the relationship among sides and angles of basic polygons determine the polygon's possible shape and use. Several useful labeling schemes are frequently used in mathematics. Flexibility needs to be developed in "reading" shapes and in using labeling schemes as a way to makes ideas about figures clear. 	<ul style="list-style-type: none"> What kind of tiles will cover a flat surface? What geometric characteristic lets them fit together? What are the simplest geometric shapes and figures? How do these simple figures work together to make more complex shapes? How can angle measures be estimated? How much accuracy is needed? Why is it important to find accurate angle measures? What patterns can be found in the angle measures of regular figures? Of non-regular figures? Do these patterns apply to other figures? 	<p>Students will know</p> <ul style="list-style-type: none"> Key terms (e.g., angle, degree, hexagon, octagon, parallelogram, pentagon, polygon, quadrilateral, rectangle, regular polygon, right angle, side, square, symmetry, triangle vertex). What changes and what remains constant as triangles, squares, rectangles, and parallelograms are rotated and flipped. <p>Students will be able to</p> <ul style="list-style-type: none"> Determine what shapes can be used to cover the plane. Describe the structural applications in which polygons of various shapes appear. Explain the property of the triangle that makes it useful as a stable structure. Develop a variety of strategies for solving problems involving polygons.

Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> Bees and Polygons What tile shapes can be used to cover the plane? Students make conjectures and use physical materials to explore possibilities. 	<p>Check-Up 1 Quiz A Check-Up 2 Quiz B</p>	<p>Teacher observations of students during work on performance tasks. Accountable talk during work on performance tasks.</p>

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> • Building Polygons Students investigate as to whether the shape of a polygon is determined by the lengths of its sides and the order in which those sides are connected. • Polygons and Angles Students are introduced to basic ways of thinking about angles and the ideas behind angle measurement. Students practice estimating angle measurements based on measurements using the right angle as a benchmark. • Polygon Properties and Tiling Students use tiling as a context for focusing attention on some basic properties of familiar quadrilaterals. • Side-Angle-Shape Connections Students look for what remains constant and what changes, as triangles, squares, rectangles, and parallelograms are rotated and flipped. The symmetries of the figures are discussed as students work with the geometric figures. 	Unit Test Unit Project – What I Know About Shapes and Designs	