Grade: 4 **Subject:** Mathematics	**Unit 4: Angles and Polygons**
Big Idea/Rationale:	• This unit introduces measuring angles, using a protractor. Students use these concepts to sort and classify angles and triangles. Concepts involving angles are applied in rotations and rotational symmetry. Concepts involving perimeter and area are extended to include perimeter of any polygon and area of triangles. Concepts involving patterns and congruence are applied as students explore transformations.
Enduring Understanding (Mastery Objective):	Students will understand that: • Line segments and rays are sets of points that describe parts of lines, shapes, and solids. • Angles are formed by two intersecting lines, or rays with a common endpoint. • Plane shapes have many properties that make them different from others. • Measurements can be used to describe, compare, and make sense of phenomena. • The amount of space around a polygon is its perimeter. • Shape and area can be conserved during mathematical transformations.
Essential Questions (Instructional Objective):	• What are some important geometric names for lines? • What geometric terms describe types of angles? • How do you identify polygons? • How can measurements be used to solve problems? • What are symmetrical figures? • How can you create a figure with a line of symmetry? • What situations can be analyzed using transformations and symmetries? • How can you use objects to solve a problem?
Content (Subject Matter & Learning Objectives):	• Make and describe right, acute, and obtuse angles. • Measure angles. • Apply knowledge of angles to real- world situations. • Demonstrate an understanding of rotations and symmetry. • Define, identify, and draw right, obtuse and acute triangles. • Define, identify, and draw scalene, isosceles, and equilateral triangles. • Recognize how two congruent triangles make a parallelogram. • Discover how the diagonal of a parallelogram splits the figure into two congruent triangles. • Find the perimeter and area of triangles. • Identify the attributes of, and name regular and irregular polygons. Construct a variety of polygons, including regular, irregular, convex, and concave. • Find the perimeter of polygons.

	• Rotate, translate, and reflect figures. • Use transformations to prove congruence and extended patterns.
Standards	• **4.MD.C.5:** Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement. • **4.MD.C.5.A:** An angle is measured with reference to a circle with its center at a common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle", and can be used to measure angles. • **4.MD.C.5.B:** An angle that turns through *n* one-degree is said to have an angle measure of *n* degrees. • **4.MD.C.6:** Measure angles in whole-numbers degrees using a protractor. Sketch angles of specific measure. • **4.MD.C.7:** Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measure of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems. • **4.G.A.1:** Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. • **4.G.A.2:** Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specific size. Recognize right triangles as a category, and identify right triangles. • **4.G.A.3:** Recognize a line of symmetry for a two-dimensional figures as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetry figures and draw lines of symmetry. • **Mathematical Practices**
Materials and Resources	• Math Expressions, Student Journals, Manipulatives, Math themed literature, BrainPop, IXL Mathematics