Pattern Blocks

Measurement of interior angles of regular polygons

Topic: Angle measures in regular polygons.

Grade: 7th Grade

Compentency: R3.07 Classify Angles
3.08 Classify Polygons
5.03 Read Instruments that Measure Quantities, ie Protractorss.

Performance Objective: TLW investigate angle measurement in a variety of regular polygons and determine which regular polygon angle combinations will tessellate around a center point.

Materials: Cloak For The Dreamer by A. Friedman, fabric tessellations-designed from squares, rectangles, isosceles triangles, hexagons, and circles, pattern blocks, large modeling pattern blocks, student mirrors, large modeling mirror, 180/360 degree protractors, large modeling protractor, foam regular pentagons, heptagons, octagons, dodecagons, and Interior Angle Measurement handout.

Lessons:

- **Focus/Motivation:** Introduction of concept using displayed fabric tessellations which replicate the cloak patterns in the tradebook, Cloak For The Dreamer. Encourage discussion regarding the tessellation/non-tessellation of various polygons within the cloak patterns.
  Read Cloak For The Dreamer.

- **Modeling:** Discuss vertex configurations and the 360 degree rotations of polygons around a center point using fabric models. Clarify the term REGULAR polygon using overhead regular (pattern blocks) and non-regular polygons. Determine interior angle measurements of the polygons using mirrors and pattern blocks. Reinforce the determined angle measurement found by the student by allowing them to measure the angles using standard 180/360 degree protractors.
  Introduce formula for interior angle measurement; Interior angle measure=180-360/n. Determine what angle combinations will tessellate around a point using pattern blocks, foam models, protractors, mirrors and formula.

- **Guided Practice:** Complete Interior Angle Measurement Handout.

- **Independent Practice:** Sketch 12 possible angle combinations using triangles, quadrilaterals, pentagons, hexagons, heptagons, octagons, nonagons, decagons, and dodecagons.

- **Closure:** Review angle concepts emphasizing the formula for Interior angle measurement.

Assessment: Interior Angle Measurement Handout.
Angle Combination Sketches.

Reteach: Measure angles of polygons using mirrors, protractors, and the interior angle measure formula using pre-marked foam polygons.
Recreate angle combinations using pre-marked polygon.

Extension: Using pattern blocks create a full tessellating geometric design.

Interior Angle Measurement Of Regular Polygons

Polygon	Number of Sides	Measure of Each Interior Angle
Triangle		
Quadrilateral		
Pentagon		
Hexagon		
Octagon		
Nonagon		
Decagon		
Dodecagon		

$$\text{Angle Measurement} = 180 - \frac{360}{\#\text{ of sides}}$$