1. **GRADE LEVEL: Grade 7**

Subject Area: Mathematics

Quarter 1 – Week   
Duration: 45 minutes

1. **LEARNING OBJECTIVES**

Learners are expected to:

1. Students will be able to define and identify an exterior angle of a polygon
2. Students will be able to explain that an interior angle and its adjacent exterior angle are supplementary
3. Students will be able to calculate the measure of an exterior angle given the interior angle, and vice-versa.
4. **CONTENT**

* Title: Inside Out: Interior and Exterior Angles
* Learning Competency: deduce the relationship between the exterior angle and adjacent interior angle of a polygon.
* Particular Focus: Understanding that an interior angle and its adjacent exterior angle form a linear pair and therefore sum to 180 degrees.

1. **LEARNING RESOURCES**

1. Teacher's Guide
2. Geometry software for demonstration (e.g., GeoGebra)
3. Protractors and rulers
4. Worksheets with polygon diagrams
5. PPT: 'Polygon Angles: Inside and Out'
6. **PROCEDURE**

**Introduction:**

Review the concept of a straight line having a measure of 180 degrees. Draw a triangle and extend one side to create an exterior angle. Ask students: 'If we know the angle inside the triangle, how can we find the angle just outside it?' Guide them to see the straight line relationship.

**Presentation:**  
The teacher formally defines 'interior angle' and 'exterior angle'. Using an interactive tool like GeoGebra, the teacher demonstrates that as you change the shape of a polygon, the sum of an interior angle and its adjacent exterior angle always remains 180°. This is reinforced with several static examples and calculations on the whiteboard.

**Practice:**  
Students are given a worksheet with various polygons where some interior or exterior angles are given. Their task is to calculate the missing adjacent angle. For a hands-on activity, students can draw a large polygon on paper, measure an interior angle with a protractor, and then measure its adjacent exterior angle to verify the relationship.

**Integration:**  
Connect this to real-world scenarios like civil engineering and surveying, where calculating angles on a piece of land is fundamental. Discuss how the concept applies to programming animations or games, where objects need to rotate by a certain exterior angle to 'turn a corner'. Values: Discovering predictable patterns in mathematics.

**Assessment:**  
['1. An interior angle and its adjacent exterior angle always sum to \_\_\_\_ degrees. (180)', ' 2. If an interior angle of a polygon is 120°, what is its exterior angle? (60°)', ' 3. True or False: The exterior angle of a right-angled vertex is also 90°. (True)', ' 4. If an exterior angle is 45°, what is the interior angle? (135°)']

**Enrichment:**  
["Remediation: Focus only on triangles first. Have students physically walk along the sides of a large triangle on the floor and 'turn' the exterior angle to feel the rotation. Provide a worksheet with the 180° formula explicitly stated for each problem.", ' Enhancement: Ask students to prove that the sum of the exterior angles of any convex polygon is always 360°. Have them demonstrate this by drawing and measuring or through a logical argument.']  
**Asignment:**  
Complete a table for a pentagon, a hexagon, and an octagon. For each, if it were a regular polygon, calculate the measure of one interior angle and one exterior angle.

1. **EVALUATION TOOLS**

The worksheet will be the primary assessment tool, checked for calculation accuracy. An exit ticket will ask: 'Explain the relationship between an interior angle and an exterior angle of a polygon in one sentence.' This will assess conceptual grasp. Teacher will observe student work to see if they are correctly identifying the angle pairs.

1. **REMARKS**

['The most common mistake is for students to incorrectly identify the exterior angle. Use colored markers to clearly distinguish the interior and exterior angles in all diagrams. The GeoGebra demonstration is very powerful', ' ensure the projector is clear and students can see the angle measures changing in real-time.']

1. **REFLECTION**

The GeoGebra visualization was the most effective part of the lesson. Students could see the supplementary relationship held no matter how the polygon was stretched or skewed. Some students were initially confused about which angle was the 'exterior' one. In the future, I will explicitly teach them to 'extend the side' to create the exterior angle. The hands-on measuring activity also helped solidify the concept.