1. **GRADE LEVEL: Grade 7**

Subject Area: Mathematics

Quarter 1 – Week   
Duration: 45 minutes

1. **LEARNING OBJECTIVES**

Learners are expected to:

- Students will be able to name polygons with 3 to 12 sides - Students will be able to differentiate between regular and irregular polygons based on side and angle equality - Students will be able to distinguish between convex and non-convex (concave) polygons.

1. **CONTENT**

* Title: The Polygon Sorting Challenge
* Learning Competency: classify polygons according to the number of sides, whether they are regular or irregular, and whether they are convex or non-convex.
* Particular Focus: Developing a systematic way to classify polygons using three key attributes: number of sides, regularity, and convexity.

1. **LEARNING RESOURCES**

* Teacher's Guide
* Chart of polygon names (triangle, quadrilateral, pentagon, etc.)
* A set of plastic or paper polygon shapes (various types)
* Interactive whiteboard or projector
* PPT: 'Classifying Polygons'

1. PROCEDURE

Introduction:

Start with a 'mystery shape' game. Describe a shape ('I have 5 sides and 5 vertices. What am I?') to review polygon names. Introduce the terms 'convex' and 'non-convex' (concave) by drawing examples and showing how a line segment connecting two points in a non-convex polygon can go outside the shape.

Presentation:  
The teacher presents a classification chart with columns for 'Name', 'Number of Sides', 'Regular/Irregular', and 'Convex/Non-Convex'. Using the set of polygon shapes, the teacher picks one, holds it up, and guides the class in filling out the chart for that shape. This is repeated with several examples, including a regular pentagon, an irregular hexagon, and a non-convex heptagon (star shape).  
Practice:  
In small groups, students are given a bag of mixed polygon shapes. Their task is to sort them into categories based on the classification criteria and fill out a classification table for all their shapes. Each group then presents one of their 'most interesting' polygons to the class, explaining its classification.

Integration:  
Discuss the use of specific polygons in logos (e.g., Mitsubishi's triangles), architecture (convex vs. non-convex building footprints), and science (molecular shapes). Values: The importance of precise language and categorization in communication and science.

Assessment:  
['1. What is a polygon with 8 sides called? (Octagon)', ' 2. A polygon where all interior angles are less than 180° is called \_\_\_\_\_. (Convex)', " 3. True or False: A rectangle is a regular polygon. (False, unless it's a square)", ' 4. Describe a non-convex quadrilateral. (A dart or arrowhead shape)']

Enrichment:  
['Remediation: Provide students with a pre-made chart of polygon names and their number of sides. Use shapes with color-coded sides to help them quickly see if they are equal or not.', ' Enhancement: Challenge students to create their own non-convex polygons with a specific number of sides.']  
Asignment:  
Draw three polygons: a regular hexagon, an irregular pentagon, and a non-convex octagon. Label each one clearly.

1. EVALUATION TOOLS

The group sorting activity will be assessed with a checklist for accuracy in classification. Student presentations will be assessed on clarity of explanation. A simple exit slip asking students to draw one convex and one non-convex polygon will check for understanding of that concept.

1. REMARKS

Having physical polygon shapes is crucial for this lesson to be effective. If not available, use printable cut-outs. The term 'concave' can be used interchangeably with 'non-convex' and can be easier for students to remember (it 'caves' in).

1. REFLECTION