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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Mathematics

Quarter 1
Lesson
2

Lesson Exemplar for Mathematics Grade 7
Quarter 1: Lesson 2 (Week 2)
SY 2024-2025

Development Team

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Research Institute for Teacher Quality
SiMERR National Research Centre

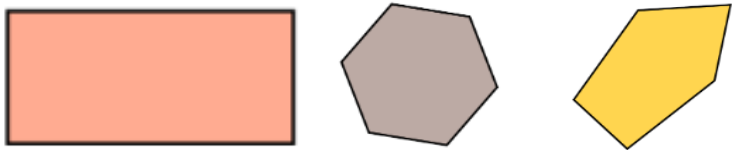
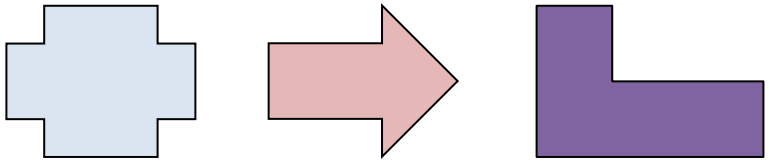
MATHEMATICS / QUARTER 1 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners demonstrate knowledge and understanding of: 1. regular and irregular polygons and their features/properties; and 2. determination of measures of angles and the number of sides of polygons.
B. Performance Standards	By the end of the quarter, the learners are able to draw, and describe the features/properties of, regular and irregular polygons.
C. Learning Competencies and Objectives	***Learning Competency*** The learners are able to: 1. classify regular or irregular polygons whether they are convex or nonconvex; and 2. describe and explain the relationships between angle pairs based on their measures.
D. Content	Classification of polygons according to the number of sides Angle Pairs Relationships between angle pairs based on their measures.
E. Integration	Robotics, Perspective Drawing, Graphics and Animation

II. LEARNING RESOURCES
Cuemath. (n.d.). Convex Shape. https://www.cuemath.com/geometry/convex-shapes-functions/ Larson, R., & Edwards, B. H. (2013). Calculus. Cengage Learning. McGraw-Hill Education. (2017). Geometry. McGraw-Hill. Sullivan, M. (2014). Algebra and Trigonometry. Pearson Education.

III. TEACHING AND LEARNING PROCEDURE		**NOTES TO TEACHERS**
A. Activating Prior Knowledge	**DAY 1** **1. Short Review** Tell the learners, "Shown are common road signs or markings, name the polygon used for each road signage."	Alternative task for the review: Give review questions about the topics in lesson 1. It could be a quiz like activity

	 **2. Feedback (Optional)**	
B. Establishing Lesson Purpose	**1. Lesson Purpose** Tell learners that a polygon in previous lesson was classified according to number of sides, as regular or irregular, this time, polygons will be described in another way – convex and non-convex**.** **DAY 1** **2. Unlocking Content Vocabulary** **a. Convex Polygons**: A convex polygon is a polygon where all interior angles are less than 180 degrees, and no vertices point inward. In other words, a line segment drawn between any two points in the polygon will always lie inside or on the boundary of the polygon. **b. Non-Convex (Concave) Polygons**: A non-convex or concave polygon is a polygon that has at least one interior angle greater than 180 degrees. This type of polygon has at least one vertex that points inward, and a line segment drawn between some points within the polygon may pass outside it. **DAY 2-3** **a. Complementary angles** are two angles whose measures add up to 90 degrees. For example, if one angle measures 30 degrees, the other angle must measure 60 degrees to be complementary. **b. Supplementary angles** are two angles whose measures add up to 180 degrees. For instance, if one angle measures 110 degrees, the other must measure 70 degrees to be supplementary. **c. Adjacent angles** are two angles that share a common side and a common vertex, and do not overlap. They are next to each other.	

	d. A **linear pair** is a pair of adjacent angles formed when two lines intersect. The angles in a linear pair add up to 180 degrees. **e.** **Vertical angles** are the pairs of opposite angles made by two intersecting lines. These angles are always equal to each other.	
C. Developing and Deepening Understanding	**DAY 1** **SUB-TOPIC 1: Convex and Non-Convex Polygon** **1. Explicitation** Present to the class the set of examples of convex and non-convex polygons. Give guide questions help learners distinguish a convex polygon from a non-convex polygon. The following are example of convex polygon:  The following are examples of non-convex polygon:  **2. Lesson Activity** **Activity 1: "Complete My Table"** The objective of activity 1 is to further emphasize the concept of convex and non-convex by letting learners learn it through accrual measurement. Ask the learners to compare the measure of each interior angles of the given polygons. Lead the discussion to this idea: if convex – all interior angles are less than 180 degrees, non-convex, one of the interior angles measure more than 180 degrees.	Suggestion: In presenting the explicitation activity, prepare a PowerPoint presentation or have it written on a manila paper. See to it that all learners can see the presentation. Guide questions: For similarities: • Which set of polygons are made of line segments? • Which set of polygons have vertices meet at their endpoints only? For difference: • Which set of polygons have interior angle that could measure more than 180 degrees?

DAY 2-3

SUB-TOPIC 2: Angle Pairs (Complementary and Supplementary Angles, Adjacent Angles, Linear Pairs and Vertical Angles)

1. Explicitation

What are the things that come in pairs?

2. Worked Example

Activity 2: Angle Pairs

Students will need protractor in measuring the interior angles A and B. Every group has the same question. Write your answer on a separate sheet of paper.

1. Using a protractor, measure each angle A and B. Record your measure.
2. What is the sum of the measures of angles A and B in figure1 and in figure2.
3. Are the angles complementary? Supplementary? Equal?
4. Do the angles have a common side?

Group 1. Measure the following angles using a protractor.

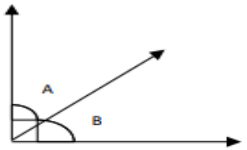


Figure 1

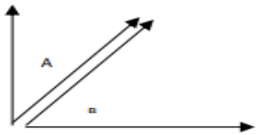
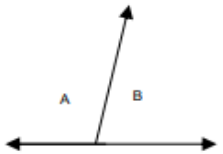
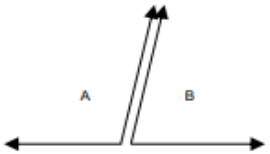


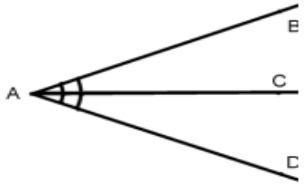
Figure 2

Group 2. Measure the following angles using a protractor.





Group 3. Measure the following angles using a protractor.



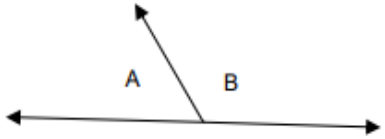
For explicitation, you may search from the internet photos of objects that always come in pairs, like spoon and fork, cup and saucer, etc.

Then tell the learners that in math there are figures that also come in pairs.

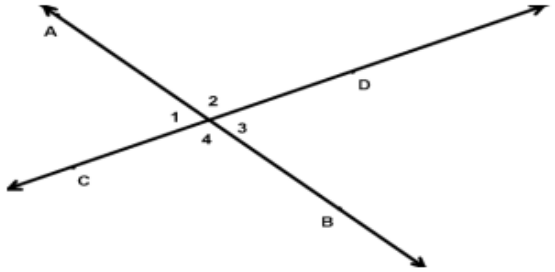
Activity 2 is a group task, again, monitoring learner's interactions and progress is important in achieving the goal of the activity.

Measurements in protractor may have discrepancies due to differences in estimation of measures, so reconcile this with your learners by setting common agreement.

Group 4. Measure the following angles using a protractor.



Group 5. Measure the following angles using a protractor.



Make a table showing the summary of the results of activity 2.

Group assignment	**Measures of Angles A and B**				**Write observations about the measurements**
	Figure 1		Figure 2		
	Angle A	Angle B	Angle A	Angle B	
Group 1					
Group 2					
Group 3	Angle BAC	Angle CAE	Angle BAD		
Group 4	Angle A	Angle B			
Group 5	Angle1	Angle2	Angle 3	Angle 4	

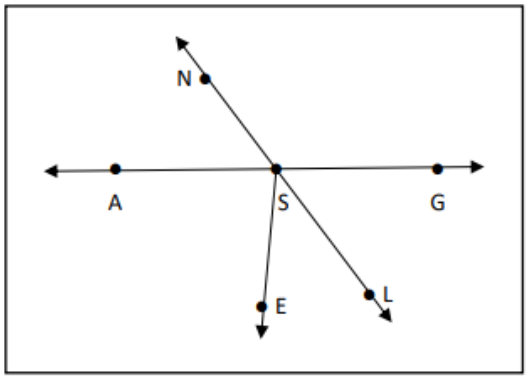
Lead the discussion of results of Activity in the naming of each angle pair. Add another column as shown below.

Group assignment	**Measures of Angles A and B**				Write observations about the measurements	Name of angle pair
	Figure 1		Figure 2			
	Angle A	Angle B	Angle A	Angle B		
Group 1						
Group 2						
Group 3	Angle BAC	Angle CAE	Angle BAD			
Group 4	Angle A	Angle B				
Group 5	Angle1	Angle2	Angle 3	Angle 4		

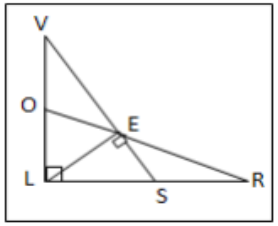
3. Lesson Activity

Activity 3: "Can You Pair my angle?"

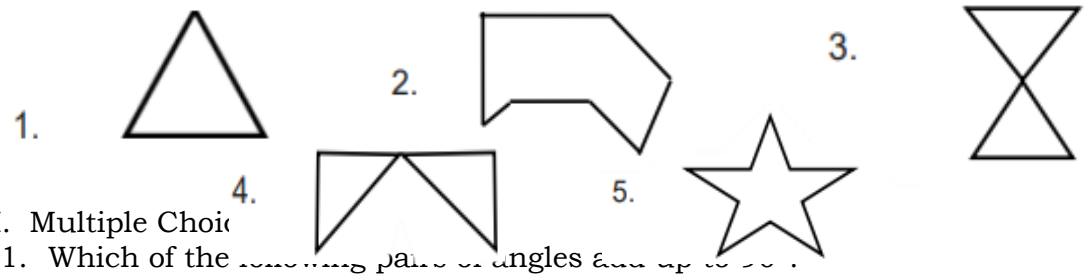
Figure 1



	Use figure 1 in answering the following questions: 1. Name a pair of adjacent angles. 2. Name a pair of angles that form a linear pair. 3. Name a pair of angles that vertical. 4. If m ∠ NSA = 75 °, what is the measure of m ∠NSG? 5. 5. If m ∠ GSL = 57 °, what is the measure of m ∠ASN?	
D. Making Generalizations	**1. Learners' Takeaways** Topic 1: Convex and Non-Convex Polygons Can you describe the distinguishing features of convex and non-convex polygons? How do these features affect the shapes and properties of each type of polygon? Topic 2: Angle Pairs What are some examples of angle pairs that you can identify in your surroundings, and how do they relate to each other in terms of their measures? **2. Reflection on Learning** Topic 1: Convex and Non-Convex Polygons Think about your approach to learning about convex and non-convex polygons. Did you encounter any challenges or misconceptions? How did you overcome them? Topic 2: Angle Pairs What aspect of angle pairs would you like to explore further?	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**DAY 4** **1. Formative Assessment** I. Identify each pair of angles as adjacent, vertical, complementary, supplementary, and/or as a linear pair. 1.∠LER and ∠VEL 2.∠OLE and ∠ELS 3.∠VER and ∠SEO 4.∠LOE and ∠VOE 5.∠VEO and ∠LEO 	Since the assessment may consume 30 minutes only, you may use the time before assessment to review or clarify some questions regarding the 2 lessons for the week.

II. Classify each figure as a convex polygon, a non-convex, regular polygon or irregular polygon.



III. Multiple Choi

1. Which of the following pairs of angles add up to 90°?
   A) Supplementary angles
   B) Complementary angles
   C) Adjacent angles
   D) Vertical angles

2. What type of angles are formed when two lines intersect and share a common vertex but do not overlap?
   A) Supplementary angles
   B) Complementary angles
   C) Adjacent angles
   D) Linear pair

3. In a linear pair, the angles add up to:
   A) 90∘ B) 180∘ C) 270∘ D) 360∘

4. Convex and Non-Convex Polygons: Which of the following best describes a convex polygon?
   A) It has at least one interior angle greater than 180∘180∘.
   B) All of its interior angles are less than 180∘180∘.
   C) It has at least one vertex pointed inward.
   D) It has at least one pair of opposite angles equal to each other.
5. What distinguishes a non-convex (concave) polygon from a convex polygon?
   A) It has all angles less than 90∘
   B) It has all angles greater than 180∘
   C) It has at least one interior angle greater than 180∘
   D) It has all sides of equal length.

Answer Key:

I.
1. Adjacent Angles
2. Complementary Angles
3. Vertical Angles
4. Linear Pair/Supplementary Angles
5. Complementary Angles

II.
1. Convex
2. Non Convex
3. Non Convex
4. Non Convex
5. Non Convex

III. Multiple Choice
1. B) Complementary angles
2. C) Adjacent angles
3. B) 180∘
4. B) All of its interior angles are less than 180∘180∘.
5. C) It has at least one interior angle greater than 180∘

<table>
<tr><td></td><td colspan="3">2. Homework (Optional)
This sub-component allows students to attempt as a form of deliberate practice what was covered in the lesson.</td><td></td></tr>
<tr><td rowspan="5">B. Teacher's Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5">The teacher may take note of some observations related to the effective practices and problems encountered after utilizing the different strategies, materials used, learner engagement, and other related stuff.

Teachers may also suggest ways to improve the different activities explored/lesson exemplar.</td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>others</td><td></td><td></td></tr>
<tr><td>C. Teacher's Reflection</td><td colspan="3">Reflection guide or prompt can be on:
• <u>principles behind the teaching</u>
What principles and beliefs informed my lesson?
Why did I teach the lesson the way I did?

• <u>students</u>
What roles did my students play in my lesson?
What did my students learn? How did they learn?

• <u>ways forward</u>
What could I have done differently?
What can I explore in the next lesson?</td><td>Teacher's reflection in every lesson conducted/facilitated is essential and necessary to improve practice. You may also consider this as an input for the LAC/Collab sessions.</td></tr>
</table>