MA.5.GR.1.1

Overarching Standard: ***MA.5.GR.1*** Classify two-dimensional figures and three-dimensional figures based on defining attributes.

Benchmark of Focus

MA.5.GR.1.1 Classify triangles or quadrilaterals into different categories based on shared defining attributes. Explain why a triangle or quadrilateral would or would not belong to a category.

Benchmark Clarifications

Clarification 1: Triangles include scalene, isosceles, equilateral, acute, obtuse and right; quadrilaterals include parallelograms, rhombi, rectangles, squares and trapezoids.

Related Benchmark/Horizontal Alignment

- There are no direct connections outside of this standard; however, teachers are encouraged to find possible indirect connections.

Vertical Alignment

Previous Benchmarks	**Next Benchmarks**
MA. 4.GR.1.1	MA.912.GR.3.2

Terms from the K-12 Glossary

- Acute Triangle
- Equilateral Triangle
- Isosceles Triangle
- Obtuse Triangle
- Parallelograms
- Quadrilateral
- Rectangle
- Rhombus
- Right Triangle
- Scalene Triangle
- Square
- Trapezoid
- Triangle

Purpose and Instructional Strategies

The purpose of this benchmark is for students to understand that shapes can be classified by their attributes and these attributes may place them in multiple categories. In Grade 3, students identified and drew quadrilaterals based on their attributes (MA.3.GR.1.2). In Grade 4, students explored angle classifications and measures in two-dimensional figures (MA.4.GR.1.1). This past work built the understanding required for students to classify triangles and quadrilaterals in Grade 5. Classification of geometric figures will return in high school geometry (MA.912.GR.3.2) using another Grade 5 concept, the coordinate plane.

• The work in Grade 5 will help students to understand that triangles can be defined by two different attributes that students can actually measure: the length of their sides (3 congruent sides, 2 congruent sides, or 0 congruent sides) or by the size of their angle measures (3 acute angles, 2 acute angles and a right angle, or 2 acute angles and an obtuse angle).

• During instruction, it is important for students to have practice with classifying figures in multiple ways so they can better understand the relationship between attributes of the geometric figures. In addition, students should practice this concept by using graphic organizers such as, flow charts, T-charts and Venn diagrams (MTR.2.1).

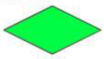
• This benchmark requires a strong understanding and use of geometry vocabulary. Allow students to use math discourse throughout instruction to compare the attributes of geometric figures. For example, pose questions such as, "Why is a square always a rhombus?" and "Why is a rhombus not always a square?" Lesson activities should require students to justify their thinking when making mathematical arguments about geometric figures (MTR.4.1).

Common Misconceptions or Errors

• Students may think that when describing and classifying geometric shapes and placing them in subcategories, the last subcategory is the only classification that can be used. • Students may think that a geometric figure can only be classified in one way. For example, a square (a shape with 4 congruent sides and 4 congruent angles) can also be a parallelogram because it contains 2 pairs of sides that are congruent and parallel.

Strategies to Support Tiered Instruction

- Instruction includes providing a graphic organizer and having students place triangles and/or quadrilaterals into all the subcategories they belong to. Students then identify all the ways the figure could be classified.
    - For example, students are provided with a graphic organizer like the one shown below to help them classify figures into subcategories. The name of the figure, an example, and the definition are provided. Students then identify which other categories the figure would also fit. For example, a parallelogram is a quadrilateral containing two pairs of parallel sides. A rectangle, rhombus, and square all also have two pairs of parallel sides so they would also fit in this subcategory. The teacher refers to the glossary, included with the standards, for several examples to provide students.

Figure	Definition	Other Figures that Fit in this Category
Parallelogram 	A quadrilateral containing two pairs of parallel sides.	
Rectangle 	A quadrilateral containing four right angles.	
Rhombus 	A quadrilateral containing four equal-length sides.	
Square 	A quadrilateral with four right angles and four equal-length sides.	
Trapezoid 	A quadrilateral with **at least** one pair of parallel sides.	

- Instruction includes providing a graphic organizer and having students place triangles and/or quadrilaterals into all the subcategories they belong to. Students then identify all the ways the figure could be classified.
    - For example, students are provided with a graphic organizer like the one shown below to help them classify figures into subcategories. The name of the figure, an example, and the definition are provided. Students then identify which other categories the figure would also fit. For example, a parallelogram is a quadrilateral containing two pairs of parallel sides. A rectangle, rhombus, and square all also have two pairs of parallel sides so they would also fit in this subcategory. The teacher refers to the glossary, included with the standards, for several examples to provide students.

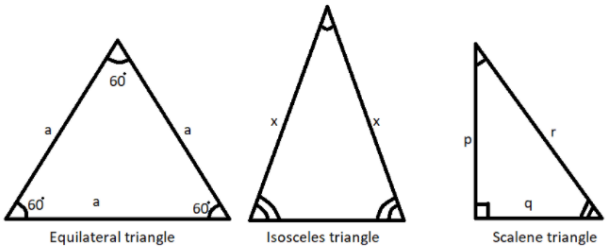
Classifying Quadrilaterals

	Trapezoid	Parallelogram	Rhombus	Rectangle	Square
Sides					
Angles					
Picture					

Questions to ask students:

- *Is a square always, sometimes, or never a rhombus? Why?*
    - Sample answer that indicates understanding: A square is always a rhombus because a rhombus is a quadrilateral with all sides congruent and a square also always had four congruent sides. Sometimes a rhombus is not a square though because it does not always have right angles.
    - Sample answer that indicates an incomplete understanding or a misconception: A square is never a rhombus because a rhombus looks like a parallelogram but shorter and does not have right angles.

- *Describe the similarities and differences between the triangles below.*



- Sample answer that indicates understanding: All three shapes are similar because they are triangles. Each triangle has 3 sides, 3 vertices, and 3 angles. They are different because the side

lengths are different. The equilateral has 3 equal sides. The Isosceles triangle has 2 equal sides. The Scalene triangle has no equal sides of equal length.

- Sample answer that indicates an incomplete understanding or a misconception: Students recognize that all three shapes are triangles, however, cannot describe the differences (3 congruent sides, 2 congruent sides, or 0 congruent sides) or by the size of their angle measures (3 acute angles, 2 acute angles and a right angle, or 2 acute angles and an obtuse angle).

Instructional Tasks
Instructional Task 1

Part A. Roll a number cube twice and write a statement based on the key below.

Number Cube Key

1 – Equilateral

2 – Acute

3 – Right

4 – Obtuse

5 – Isosceles

6 – Scalene

Part B. Write a statement that reads, "A(n) _____ (roll 1) triangle is _____ (always, sometimes or never) a(n) _____ triangle (roll 2)." Complete your statement by determining whether the category of triangle from roll 1 is always, sometimes, or never the category of triangle from roll 2. Complete this process three more times for a total of four statements.

Part C. Choose one of the statements that you said is sometimes true. Give an example of when the statement is true and when the statement is not true using picture models or words. If none of your statements are sometimes true, then create one to give an example.

Instructional Items
Instructional Item 1 Choose all the shapes that can always be classified as parallelograms.

a. Trapezoid
b. Rectangle
c. Rhombus
d. Square
e. Equilateral Triangle

Achievement Level Descriptors

Benchmark	Context	Assessment Limits
MA.5.GR.1.1Classify triangles or quadrilaterals into different categories based on shared defining attributes. Explain why a triangle or quadrilateral would or would not belong to a category. Clarification 1: Triangles include scalene, isosceles, equilateral, acute, obtuse, and right; quadrilaterals include parallelograms, rhombi, rectangles, squares and trapezoids.	Mathematical	Right angles will have the right angle marker. Items with two-dimensional figures will not include hatch marks representing sides of equal lengths, arcs representing angles of equal measure, or arrows to indicate parallel lines/sides.

ALD 2	ALD 3	ALD 4	ALD 5
Given the classification attribute, explains why a triangle or quadrilateral would or would not belong to a category.	Classifies triangles or quadrilaterals into different categories based on a given attribute; explains why a triangle or quadrilateral would or would not belong to a category.	Classifies triangles or quadrilaterals into different categories based on shared defining attributes; explains why a triangle or quadrilateral would or would not belong to a category.	Classifies triangles or quadrilaterals into more than one category based on shared defining attributes; explains why a triangle or quadrilateral would or would not belong to a category.

Additional Resources:

CPALMS MA.5.GR.1.1 - Classify triangles or quadrilaterals into different categories based on shared defining attributes. Explain why a triangle or quadrilateral would or would not belong to a category. (cpalms.org)

Classifying Triangles by Angles using Euler Diagrams – Part 3 Learn to classify triangles and use Eu ... (cpalms.org)

Khan Academy: Classifying quadrilaterals (video) | Khan Academy

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Resources/Tasks to Support Your Child at Home:

PBS Media: https://florida.pbslearningmedia.org/resource/mkcpt.math.g.quadrilaterals/classifying-quadrilaterals/#.WWbk68uWxMs

LearnZillion: Classify triangles by examining their properties | LearnZillion

LearnZillion: Classify and compare quadrilaterals | LearnZillion