

HPISD Fifth Grade TAG Math

UNIT NAME	ESTIMATED DURATION	9 WEEKS			
UNIT 5: RELATIONSHIPS IN GEOMETRY	15 DAYS	1	2	3	4

Unit Overview

The student applies mathematical process standards to classify two-dimensional figures by attributes and properties.
 The student applies mathematical process standards to use geometry to represent relationships and solve problems.
 The student applies mathematical process standards to develop geometric relationships.

Enduring Understandings

The student will understand that:	<ul style="list-style-type: none"> • Triangles and their properties have relationships between the side lengths and angle measures. • You can decompose and rearrange shapes to determine area and generate area equations. • Models can be used to find area and volume of shapes. • Equations can be written and solved using geometric concepts. • Geometric figures are related through their properties and attributes.
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Concepts

Triangle Sum Theorem	The measures of the angles in a triangle add up to 180 degrees.
Measure of an Exterior Angle	The measure of an exterior angle is equal to the sum of the remote interior angles.
Triangle Inequality	The sum of the lengths of any two sides of a triangle is greater than the length of the third side.
Proportionality	A change in one variable is always accompanied by a change in the other and the changes are related by a constant
Equilateral	A triangle with three congruent sides or angles.
Area	The number of square units needed to cover a given surface.
Volume	The number of cubic units needed to fill a given space.

Guiding/Essential Questions

- How can you use the relationship between side lengths to determine when three lengths for a triangle?
- How do you use the sum of angles in a triangle to find an unknown angle measure?
- How can you use the relationships between side lengths and angle measures in a triangle to solve problems?
- How can you find the areas of parallelograms, rhombuses, and trapezoids?
- How can you find the area of a triangle?
- How can you use equations to solve problems about area of rectangles, parallelograms, trapezoids, and triangles?
- How do you write equations to solve problems involving volume of right rectangular prisms?

- How do you classify two-dimensional figures based on their properties and attributes?
- How can you represent relationships and hierarchies of figures using graphic organizers?

Learning Targets and Progressions

- **Students will extend their knowledge of formulas for area, perimeter, and volume.**
 - Understand dimensions of 2-D and 3-D shapes
 - Apply formulas to solve for an unknown dimension
- **Students will recognize triangles and their properties to understand the relationship between length of sides and measures of angles in a triangle.**
 - Identify types of angles (acute, obtuse, and right)
 - Connect the types of angles to their degree measurement
 - Construct triangles based on their attributes
 - Relate angle measures to corresponding side lengths
- **Students will write equations and determine solutions for problems involving area and volume.**
 - Understand dimensions of 2-D and 3-D shapes
 - Apply formulas to solve for an unknown dimension
 - Solve using inverse operations for a variable

Formative Assessments

TEKS: Readiness Standards

5.4H represent and solve problems related to perimeter and/or area and related to volume
5.5A classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties
6.8D determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers

Summative Assessments

TEKS: Supporting Standards

5.4G use concrete objects and pictorial models to develop the formulas for the volume of a rectangular prism, including the special form for a cube
5.6A recognize a cube with side length of one unit as a unit cube having one cubic unit of volume and the volume of a three-dimensional figure as the number of unit cubes (n cubic units) needed to fill it with no gaps or overlaps if possible
5.6B determine the volume of a rectangular prism with whole number side lengths in problems related to the number of layers time the number of unit cubes in the area of the base
6.8A extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle.
6.8B model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes
6.8C write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers

TEKS Process Standards

5.1A/6.1A apply mathematics to problems arising in everyday life, society, and the workplace

5.1B/6.1B use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution

5.1C/6.1C select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems

5.1D/6.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate

5.1E/6.1E create and use representations to organize, record and communicate mathematical ideas

5.1F/6.1F analyze mathematical relationships to connect and communicate mathematical ideas

5.1G/6.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

Processes and Skills:

What students should be able to DO

- Classify and arrange figures based on their properties and attributes
- Show hierarchy of sets and subsets of figures
- Determine when three lengths form a triangle
- Determine when three angles form a triangle
- Create a triangle inequality to justify when sides or angles form a triangle
- Model area formulas through decomposing and rearranging parts of shapes
- Solve problems involving area and volume

Facts:

What students should KNOW

- Basic properties two-dimensional figures
- Basic properties of triangles
- Area is number of square units needed to cover a surface
- Volume is number of cubic units needed to fill a space
- Formula for area of parallelograms, rectangles, squares, rhombuses, trapezoids, and triangles
- Formula for volume of prisms

Topics

Area of Parallelograms
 Area of rectangles
 Area of rhombuses
 Area of Squares
 Area of Trapezoids
 Area of Triangles
 Attributes of Two-Dimensional Figures

Proportionality of Triangles
 Relationships between attributes of figures
 Relationships between sides and angles in a triangle
 Sum of Angle Measure in a triangle
 Triangle Inequalities
 Volume of Prisms

Language of Instruction

area
 complementary angles
 congruent
 exterior angle
 formula
 interior angle
 parallelogram
 parallelograms

rectangle
 rectangles
 rhombus
 rhombuses/rhombi
 square
 squares
 sum of angles in
 triangles

prisms properties of triangles proportionality quadrilateral quadrilaterals	supplementary angles trapezoids triangle Inequality triangles volume
State Assessment Connections	National Assessment Connections
Resources	
HMH, Texas Go Math! Unit 5 Page 417-478	