1 Reasoning with Shapes

Topic 1: Using a Rectangular Coordinate System

ELPS: 1.A, 1.C, 1.E, 1.F, 1.G, 2.C, 2.E, 2.I, 3.D, 3.E, 4.B, 4.C, 4.D, 4.J, 5.B, 5.F, 5.G

Topic Pacing: 19 Days

Lesson	Lesson Title	Highlights	TEKS*	Pacing**
1	**The Squariest Square** From Informal to Formal Geometric Thinking	Through a series of activities, students consider the range of geometric reasoning from informal to formal. To start, students attempt to sketch a "perfect" square and discuss the properties of a square. They analyze a diagram with three squares, create specific angles within the squares, use a protractor to determine their measures, and compare the sum of the measures with their classmates' results. They consider a conjecture about the sum of the measures. To determine whether this conjecture holds true in a second case, they measure the angles in a larger version of the diagram. To move towards generalization, students use patty paper to further analyze the conjecture that the angle measures sum to 90°. The diagram is then expanded through rigid motions to create other geometric properties that students can consider to formally verify the proof, although this final step is not required. They conclude that informal reasoning involves measurements, while formal reasoning involves properties.	G.4A **G.5A**	2
2	**Hip to Be Square** Constructing a Coordinate Plane	Students consider how a coordinate plane can be constructed using squares. They start by completing geometric constructions using patty paper or a compass and a straightedge. They analyze Worked Examples to construct perpendicular lines, perpendicular bisectors, and duplicated line segments. Students construct a square and then describe how rigid motions can be applied to create a coordinate plane. They then describe rigid motions that can be used to create two-dimensional shapes on a coordinate plane. Students also relate a sequence of translations to the slope of a line.	G.3C G.5B G.5C	2
Suggested Placement of Learning Individually with Skills Practice or MATHia				1
3	**Ts and Train Tracks** Parallel and Perpendicular Lines	Students investigate segments on a coordinate grid and use patty paper to create parallel and perpendicular segments. They then construct parallel lines off the coordinate plane and graph parallel lines on the coordinate plane. Students identify perpendicular lines on the coordinate plane, use a rigid motion transformation to demonstrate that their slopes are negative reciprocals, and extend their understanding of perpendicular lines to include horizontal and vertical lines. They provide an explanation to demonstrate that if two lines are parallel, then their slopes are equal.	**G.2C** **G.5A** G.5B G.5C	3
Suggested Placement of Learning Individually with Skills Practice or MATHia				1

Lesson	Lesson Title	Highlights	TEKS*	Pacing**
4	**Where Has Polly Gone?** Classifying Shapes on the Coordinate Plane	Students use a Venn diagram to sort quadrilaterals and triangles based on shared properties. They are introduced to the Distance Formula and use it to calculate the lengths of sides of triangles and quadrilaterals on the coordinate plane. Students also use the slope formula to determine whether opposite sides of a quadrilateral are parallel and whether consecutive sides of a quadrilateral are perpendicular. They use these skills to classify triangles and quadrilaterals that lie on a coordinate plane, or determine the fourth point of a quadrilateral when given three points. Students are then introduced to the Midpoint Formula and use it to classify secondary figures formed when connecting the midpoints of consecutive sides of quadrilaterals. Finally, students consider translations as a strategy to identify the coordinates that create quadrilaterals with parallel sides.	**G.2B** **G.9B**	3
Suggested Placement of Learning Individually with Skills Practice or MATHia				1
5	**In and Out and All About** Area and Perimeter on the Coordinate Plane	Students calculate the perimeter and area of rectangles and triangles on the coordinate plane. They double dimensions of figures and explain how this affects the area of the figure; they also translate figures on the coordinate plane to more efficiently determine their perimeter and area. Students algebraically determine the non-vertical height of a triangle as they treat each side as the base; they then use the height to calculate the area of the triangle. They conclude that the area of a triangle remains the same regardless of the side considered as the base and the height determined by that base. Next, students divide a composite figure into various known polygons to compute its area. They then consider real-world situations requiring them to calculate the perimeter and area of polygons that lie on a coordinate plane using the Distance Formula and decomposing the polygons into triangles and rectangles. Students determine distances represented as the area under the curve of velocity-time graphs. They investigate how proportional and non-proportional changes in the linear dimensions of a shape affect its perimeter and area. Students develop a strategy for calculating areas of regular polygons.	**G.2B** **G.2C** G.3C **G.10B** G.11A **G.11B**	4
Suggested Placement of Learning Individually with Skills Practice or MATHia				1
End of Topic Assessment				1

Texas Geometry: Module 1, Topic 1 Pacing Guide

180-Day Pacing

TEXAS MATH SOLUTION

1 Day Pacing = 45-minute Session

✪ This activity highlights a key term or concept that is essential to the learning goals of the lesson.

Day 1	Day 2	Day 3	Day 4	Day 5
TEKS: G.4A, **G.5A** **LESSON 1** **The Squariest Square** GETTING STARTED ACTIVITY 1 ✪	**LESSON 1** continued ACTIVITY 2 ✪ ACTIVITY 3 ✪ TALK THE TALK	TEKS: G.3C, G.5B, G.5C **LESSON 2** **Hip to Be Square** GETTING STARTED ✪ ACTIVITY 1 ✪	**LESSON 2** continued ACTIVITY 2 ✪ ACTIVITY 3 ✪ TALK THE TALK	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia

Day 6	Day 7	Day 8	Day 9	Day 10
TEKS: **G.2C**, **G.5A**, G.5B, G.5C **LESSON 3** **Ts and Train Tracks** GETTING STARTED ACTIVITY 1 ✪	**LESSON 3** continued ACTIVITY 2 ✪ ACTIVITY 3 ✪	**LESSON 3** continued ACTIVITY 4 ✪ TALK THE TALK ✪	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia	TEKS: **G.2B**, **G.9B** **LESSON 4** **Where Has Polly Gone?** GETTING STARTED ACTIVITY 1 ✪

Day 11	Day 12	Day 13	Day 14	Day 15
LESSON 4 continued ACTIVITY 2 ✪ ACTIVITY 3 ACTIVITY 4 ✪	**LESSON 4** continued ACTIVITY 5 ✪ TALK THE TALK	**LEARNING INDIVIDUALLY** Skills Practice OR MATHia	TEKS: **G.2B**, **G.2C**, G.3C, **G.10B**, G.11A, **G.11B** **LESSON 5** **In and Out and All About** GETTING STARTED ACTIVITY 1 ✪	**LESSON 5** continued ACTIVITY 2 ✪

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Day 16	Day 17	Day 18	Day 19
LESSON 5 continued **ACTIVITY 3** ✱ **ACTIVITY 4**	**LESSON 5** continued **ACTIVITY 5** ✱ **ACTIVITY 6** ✱ **TALK THE TALK**	**LEARNING INDIVIDUALLY** Skills Practice **OR** MATHia	**END OF TOPIC ASSESSMENT**