Name_____ Date _____

Chapter 3 Performance Task

Squaring a Treehouse

Instructional Overview	
Launch Question	When builders construct any structure, they make sure it is plumb, level, and square. What do these terms mean? How are they related to concepts of geometry? What relationships between them can you support?
Summary	This task asks students to apply the definitions they learn in geometry to real-world settings, including a house and a treehouse.
Teacher Notes	The terms given in the first part of the task are typical terms used in construction. Students need to apply vocabulary and mathematical concepts inside and outside of their mathematics course so that they become comfortable with their use.
Supplies	Handouts
Mathematical Discourse	Have you looked at the lines on your house or apartment building to see if you recognize geometric concepts such as parallel or skew lines?
Writing/Discussion Prompt	Find a picture of a dream home or tree house. Describe as many different types of lines as you can from the photo.

Curriculum Content	
Content Objectives	• Identify lines and planes. • Identify parallel and perpendicular lines. • Identify pairs of angles formed by transversals. • Use properties of parallel lines.
Mathematical Practices	Mathematically proficient students apply mathematical concepts in real-world settings.

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Chapter 3 Performance Task (continued)

Rubric

Squaring a Treehouse	Points
1. *Sample answer:* A line that is plumb is a vertical line. All plumb lines are parallel to each other and perpendicular to level lines. A line that is level is a horizontal line. All level lines are parallel to each other and perpendicular to plumb lines. A corner is square when it is formed by two lines that meet at right angles. A square corner is formed by the intersection of a plumb line and a level line.	**6** Total possible points **1** for each statement describing the term's relationship to geometry **1** for each statement describing the term's relationship to the other terms
2. a. 112°; vertical angles b. 112°; alternate interior angles c. 68°; consecutive interior angles d. 112°; corresponding angles	**8** Total possible points **2** for each correct part
3. *Sample answers:* a. The top and bottom of the garage door should be horizontal. b. The supports for the porch should be vertical. c. The lines are both horizontal, but not in the same plane and not parallel. d. The corners of the window frame are square, so the edges must meet at a right angle. 	**8** Total possible points **2** for each correct part
Mathematical Practices: Mathematically proficient students apply mathematical concepts in real-world settings. Students demonstrate that they can recognize geometric relationships between angles and lines in the setting of real-life structures.	**3** The student accurately identifies and describes different types of lines and angle relationships. Partial credit may be awarded.
Total Points	**25 points**

Name_____ Date _____

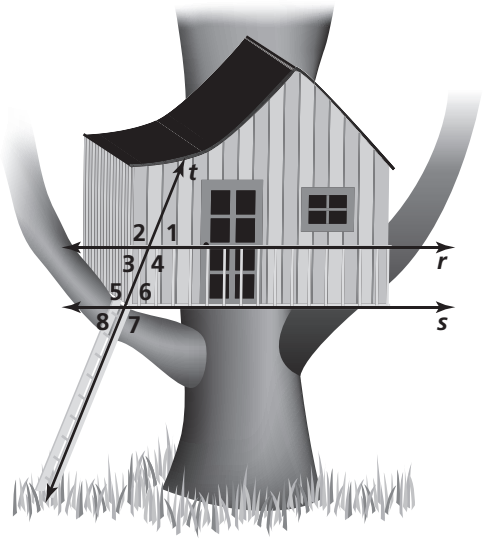
Chapter 3 Performance Task (continued)

Squaring a Treehouse

When builders construct any structure, they make sure it is plumb, level, and square. What do these terms mean? How are they related to concepts of geometry? What relationships between them can you support?

1. When building a tree house, it is important to make sure the sides are truly vertical, or *plumb*. The sides and floors must meet at right angles, so that the corners are *square*. The floors must be horizontal, or *level*. Make a statement explaining how each of the carpentry terms plumb, square, and level are connected to geometry, and a statement explaining how they relate to each other.

2. Using the picture of the treehouse at the right, find the measure of the specified angle and state its relationship to $\angle 4$. Lines r and s are parallel with a transversal t, and $m\angle 4 = 112°$.



a. $m\angle 2$ = _____

Relationship to $\angle 4$: _____

b. $m\angle 5$ = _____

Relationship to $\angle 4$: _____

c. $m\angle 6$ = _____

Relationship to $\angle 4$: _____

d. $m\angle 7$ = _____

Relationship to $\angle 4$: _____

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Chapter 3

Performance Task (continued)

3. On the photo of the house, draw and label each of the following. Justify your answer.

a. Two lines that are level, a and b

b. Two lines that are plumb, ℓ and m

c. Two skew lines, w and x

d. Two perpendicular lines, j and k

Name_____ Date _____

Chapter 3

Performance Task (continued)

Teacher Notes: