Bridging for Math Strength Resources

Standards of Learning Curriculum Framework (SOL)

Bridging Standards of Learning (SOL) for Grade 8

Bridging Standard of Learning (SOL) 8.9b Apply the Pythagorean Theorem.



Student Strengths	Bridging Concepts	Standard of Learning
Students can identify the perfect squares from 0 to 400 and determine the positive square root of a perfect square from 0 to 400.	Students can determine the positive or negative square root of a given perfect square from 1 to 400. They can verify the Pythagorean Theorem, using diagrams, concrete materials, and measurement.	Apply the Pythagorean Theorem

Understanding the Learning Trajectory

Big Ideas:

- Lengths of triangle and square sides can be compared using ideas such as longer, shorter, and equal (Charles, 2005).
- Behind every measurement formula lies a geometric result (NCTM)
- Triangles and quadrilaterals can be described, categorized, and named based on the relative lengths of their sides and the sizes of their angles (Charles, 2005).

Formative Assessment:

- Just in Time Mathematics Quick Check 8.9b Word
- Just in Time Mathematics Quick Check 8.9b PDF
- Just in Time Mathematics Quick Check 8.9b Desmos

Important Assessment Look Fors:

- The student can square numbers and find square roots.
- The student can identify the hypotenuse of a triangle.
- The student can identify right triangles given side lengths by using the Pythagorean Theorem.

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- The student can find the length of the hypotenuse or the legs using the Pythagorean theorem.
- The student can describe how to use the Pythagorean Theorem when applied to real-world problems.

Purposeful Questions:

- When thinking about the Pythagorean Theorem, does it matter which side length we substitute for each variable ($a^2+b^2=c^2$)? Why or why not?
- What is the hypotenuse? How is it relevant to real world applications?
- What is distance? How do we measure it? Are there different ways of measuring distance when thinking about real-world applications?
- How did you arrive at your length for the hypotenuse? Explain how you used the Pythagorean Theorem.

Bridging Activity to Support Standard	Instructional Tips
Routine (Would You Rather)	In this routine, be sure to select some student responses that are humorous, relate to real experiences, and others that relate to the topic of the unit.
Rich Tasks Be a Hero!	The task is purposely designed so that there are multiple ladder and distance combinations. Expect students to approach the task with varying degrees of prior knowledge about ladder use and safety. Students may not take into account that their height/arm reach when combined with the height of the ladder (and not standing on the top rung of the ladder), impacts the length of the "hypotenuse."
Games Finding Pythagoras	Directions: Draw 5 cards, Select three that create a triangle with a right angle (or closest to it). Score points (points are bad) based on the difference in the selected card and the calculated area of the hypotenuse of a right triangle.

Other Resources:

- Maze (PDF / Editable Word Doc / Google Draw / Answer Key).
  - Given an image students apply the Pythagorean Theorem to find a missing side length.
- Fire in Pythagorville (Editable Word Doc).
  - Students apply the Pythagorean Theorem in practical situations.
- VDOE Mathematics Instructional Plans (MIPS)
  - 8.9 - Pythagorean Theorem (Word) / PDF Version
- VDOE Co-Teaching Mathematics Instruction Plans (MIPS)
  - 8.9 - Pythagorean Theorem (Word) / PDF Version
- VDOE Word Wall Cards: Grade 8 (Word) | (PDF)
  - Right Triangle
  - Pythagorean Theorem

Learning Trajectory Resources:

Charles, R. (2005). Big ideas and understandings as the foundation for elementary and middle school mathematics. *Journal of Mathematics Education Leadership*, *7*(3), NCSM.

Common Core Standards Writing Team. (2019). Progressions for the Common Core State Standards for Mathematics. Tucson, AZ: Institute for Mathematics and Education, University of Arizona.

Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2018). *Elementary and Middle School Mathematics: Teaching Developmentally.* (10th edition) New York: Pearson (2019:9780134802084)

VDOE Curriculum Framework for All Grades - Standard of Learning Curriculum Framework (SOL)