Bridging for Math Strength Resources

Standards of Learning Curriculum Framework (SOL)

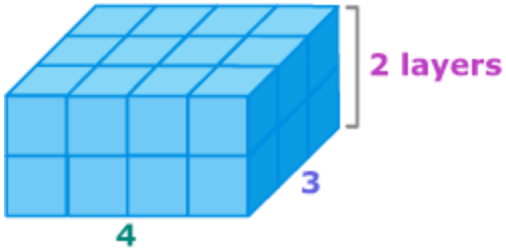
Standard of Learning (SOL) 5.8b Differentiate among perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation

Student Strengths	Bridging Concepts	Standard of Learning
Students can describe perimeter as the distance around a polygon, describe area as space covered inside a polygon, and describe volume as the space inside a 3-dimensional figure.	Students can describe the volume of a three-dimensional figure as a measure of capacity and is measured in cubic units.	Students can differentiate among perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.

Understanding the Learning Trajectory

Big Ideas:

- Area of a shape (in square units) is the number of unit squares it takes to cover the shape without gaps or overlaps (Common Core Writing Team, 2019, p. 17).
- Perimeter, area, and volume are all measurements of space in either 1, 2, or 3 dimensions. Real-world application requires students analyzing what measurement of space they are trying to find based on the unique situation, using the information given to determine a process for solving, and then applying the correct units to their solution.
- Perimeter, area, and volume all use similar information to determine their solutions (length, width, and/or height). Students must be able to determine which information is important and/or superfluous for solving the given situation.
- The formula for the volume of a rectangular prism can be discovered by reiterating the area of one layer of the rectangular prism repeatedly over itself. For example this rectangular prism has a bottom row area of 4x3=12 cubic units. The second layer also is created by a layer of 12 cubes. Therefore the volume of a rectangular prism is the area of one layer of that prism multiplied by the height of the prism. (Image from IXL)



Formative Assessment:

- Just in Time Mathematics Quick Check 5.8b PDF
- Just in Time Mathematics Quick Check 5.8b Desmos

Important Assessment Look Fors:

- The student describes a practical situation where perimeter, area, and volume are appropriate measures to use and justifies their answer.
- The student uses pictures, numbers, and/or words to show the relationship between perimeter, area, and volume and uses the dimensions (length, width, and height) to show relationship.

Purposeful Questions:

- What helped you determine if this scenario was asking about (perimeter, area, volume)?
- Which dimensions of the figure/item you are using in your example will be used to find the perimeter, area, and/or volume?
- What common misconceptions do you think someone who is new to this learning may have?

Bridging Activity to Support Standard	Instructional Tips
Routines: Math Happenings	In this math happening, students are given examples of situations that calls for area, perimeter, volume, decide and discuss which one is the best for each
Rich Tasks Slides for all 3 tasks: 5.8a Rich Tasks	
Task 1: Making Sense of Area and Perimeter (slides 1-3) Stephanie Kessinger	In the Making Sense of Area and Perimeter task, 4 children have bought 4 lengths to create a rectangle. Students first determine the total lengths of wood purchased, then build the rectangles, and find their area and perimeter. Note: Use large geoboards or grid paper to support students. Watch for students who are counting pegs and not lengths.
Task 2: Creating a Fenced Backyard (slide 4) (Perimeter/Area)	In Creating a Fenced Backyard, students must create a fence for dogs that has an area of at least 30 square yards but is no bigger than 100 square yards. Follow up questions include: How does the perimeter change when comparing a rectangle and square with the same area? What is the least or most amount of fencing you could use to fit the area requirements?
Task 3: How many Ways? (slides 5-6) (Volume)	In How Many Ways, students determine how many different rectangular prisms can be created with a volume of 48 cubic units. Encourage students to use manipulatives.

Games: Perimeter, Area, Volume Sort Henrico County	This is a simple sort however you can elevate it by asking: "Pick one example of each and explain why it is an example of perimeter, area, or volume." You can use this as a warm up with students by using 3 examples a day and discussing "Is it area, perimeter, or volume?"

Other Resources:

- Perimeter, Area, Volume Digital Sort from Henrico County: This is a simple sort however you can elevate it by asking: "Pick one example of each and explain why it is an example of perimeter, area, or volume."
- Perimeter, Area, or Volume Coaching Card created by Stephanie Kessinger: Use this support to help students determine if they are finding perimeter, area, or volume and utilizing the correct unit.
- VDOE Mathematics Instructional Plans (MIPS)
    - The Sandbox: Perimeter, Area, and Volume
- VDOE Algebra Readiness Remediation Plans
    - Banking Business
    - You Make the Decision
- VDOE Word Wall Cards: Grade 5 Word / PDF
    - Area
    - Perimeter
    - Volume

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)