



Bridging for Math Strength Resources

[Standards of Learning Curriculum Framework](#)

Standard of Learning (SOL) 8.6a Solve problems, including practical problems, involving volume and surface area of cones and square-based pyramids.



Student Strengths	Bridging Concepts	Standard of Learning
Students can evaluate and simplify algebraic expressions	Students can solve problems, including practical problems, involving volume and surface area of rectangular prisms and right cylinders	Students can solve problems, including practical problems, involving volume and surface area of cones and square-based pyramids.

Understanding the Learning Trajectory

Big Ideas:

- Calculating volume and surface area has many applications in real life.
- Understanding the dimensions of a 2D net can be useful in determining surface area and volume of the 3D solid.
- Students learn how these figures are used in the real world and understand the applications of volume and surface area in regards to these figures.

Formative Assessment:

- VDOE Just in time Quick Check [SOL 8.6a](#) (Word) / [PDF](#) / [Desmos](#)

Important Assessment Look Fors:

- Students can determine applications for volume and surface area figures
- Students can calculate volume and surface area for cones given specific dimensions
- Students can calculate volume and surface area for square-based pyramids with given dimensions

Purposeful Questions:

- What information helped you determine if this problem involved volume or surface area?
- How are the methods for finding the volume of a cone and a square based pyramid similar and different?

Bridging Activity to Support Standard	Instructional Tips
Routine Same But Different	Teachers can guide the students in a discussion regarding the similarities and differences between cones and square-based pyramids. Conversations could continue with discussion about the differences between the uses of surface area and the applications of volume
Rich Tasks Flower Vases	Students practice working with the volume formulas in a practical situation. This task involves spheres in addition to cones. As spheres are not explicitly a part of this standard, teachers can use this portion as enrichment. Teachers can extend this task to include applications for surface area and the material needed to create the vases. This task also includes changing dimensions so this task can be used with standard 8.6b as well.
Games/Tech Desmos: Pyramid Party Surface Area Desmos: Pyramid Party Volume Desmos: Going Cone Crazy Surface Area Desmos: Going Cone Crazy Volume	Students explore the relationship between pyramids and rectangle pyramids. Students practice determine which formula is needed for a given problem and develop the surface area formula for a square based pyramid Students follow a step-by-step process for calculating the volume of a square-based pyramid Students explore the relationship between cylinders and cones. Students develop the surface area formula for a cone through a step-by-step process Students calculate the volume for a cone through a step-by-step process

Other Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [8.6a - Volume and Surface Area of Cones and Pyramids](#) (Word) / [PDF Version](#)
- VDOE Algebra Readiness Remediation Plans
 - [Cones and Square Pyramids](#) (Word) / [PDF](#)
 - [Relational Solids](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: Grade 8 ([Word](#)) | ([PDF](#))
 - Pyramid
 - Cone
- Other VDOE Resources
 - [Area, Volume, and Surface Area: Find the Volume of Rectangles inside Rectangles \[eMediaVA\]](#)

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.
- Clements, D. H., & Sarama, J. (2019). Learning and teaching with learning trajectories [LT]2. Marsico Institute, Morgridge College of Education, University of Denver. <https://www.learningtrajectories.org/>
- 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.
- Richardson, K. (2012). How Children Learn Number Concepts: A Guide to Critical Learning Phases. Bellingham: Math Perspectives Teacher Development Center.
- 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 \(SOL\)](#)