



# Mathmakers!



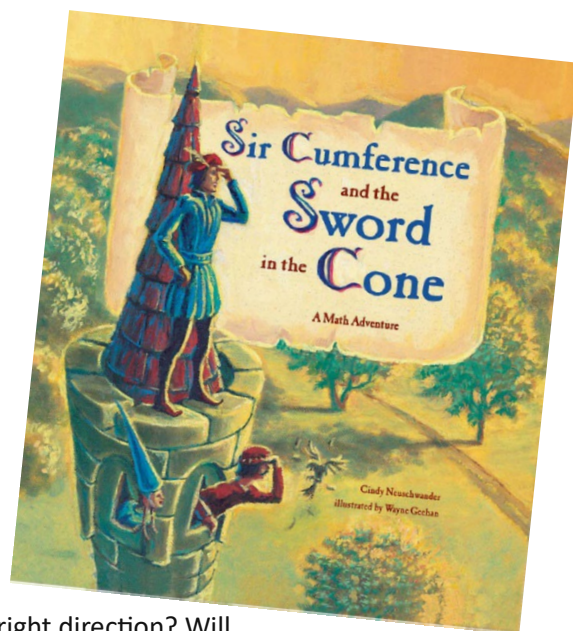
**Instructors:** Don't forget to make an Achievery account for each student! [Make your account for the Achievery in English](#) or [Make your Account for the Achievery in Spanish](#)

**Objective:** Students will identify geometric solids. They'll find the volume of geometric solids and the volume of a composite geometric solid. They will design and build their city while practicing both plane and solid geometry. Students will use many types of geometric skills, such as building nets to create buildings and structures along with designing parts of a city with shapes, lines, angles, and more.

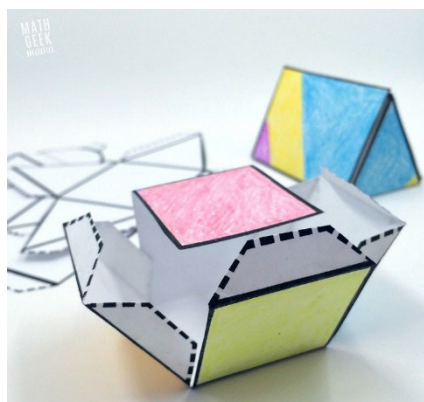
**Grade Span:** 9-12, with tips and resources for modifying for other grade levels included.

**Subjects:** Math (Geometry)

**Lesson Introduction: Watch this!** Introduce the concept of solid geometric shapes by watching a read-aloud of [Sir Cumference and the Sword in the Cone](#). A funny and pun-filled retelling of "The Sword and Stone" that introduces readers to mathematical angles. King Arthur hid his sword, Edgecalibur, and issued a challenge to the knights. The first knight to find the sword will be the next king. Can Sir Cumference and Lady Di point Radius's best friend Vertex in the right direction? Will Vertex's sharp thinking give him the edge? Join Sir Cumference, Lady Di of Ameter, and their son, Radius, in this new adventure where they race to help Vertex find the sword and discover the secrets of cubes, pyramids, cylinders, and cones.



**Lesson:** Use the Achievery lesson [Solids](#) to explore shapes with students. Living in a two-dimensional world might be boring. Thankfully, all the physical objects that you see and use every day, such as computers, phones, cars, and shoes, exist in three dimensions. They all have length, width, and height. (Even very thin objects like a piece of paper are three-dimensional. The thickness of a piece of paper may be a fraction of a millimeter, but it exists.) In the world of geometry, it is common to see three-dimensional figures. In this lesson, you'll identify geometric solids. You'll also find the volume of geometric solids and the volume of a composite geometric solid.



**Resource: Free 3D Shape Nets Printable Pack.** Being able to recognize a 3D shape's net is important for

visual-spatial development. Using the net is also a helpful way to explore surface area. Includes: Cube, Rectangular Prism, Triangular Prism, Cylinder, Triangle-Based Pyramid, Square-Based Pyramid, Pentagon-Based Pyramid, Cone.

**Activity: Skill Building!** Challenge students to use solid geometric shapes and build a model of a city.



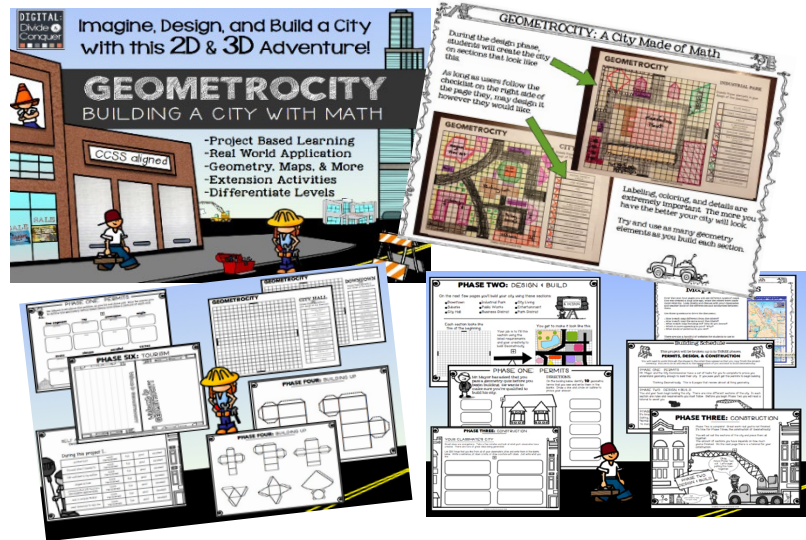
**Additional Resources:** Incorporate the geometric solids into the in-depth project from Corvillens:

[Building a City with Math](#). (Gr 3-6+) Geometrocity is a project-based learning activity where students will take their geometry skills and design their own city.

This multi-tiered activity allows for immediate differentiation because of its size, and students may complete parts, or the entire project based on the

instructor's choosing. This project doesn't just focus on math skills, as there are components of social studies (mapping skills), writing, problem-solving, collaboration, and comprehension skills too.

Students create a city that uses 2D and 3D, practicing both plane and solid geometry. Students will use many types of geometric skills, such as building nets, to create buildings and structures along with designing parts of a city with shapes, lines, angles, and more.



**Take it farther!** Build on this lesson with additional resources such as:

The Achievery lesson [Exploring 3D Geometry](#) (Gr 6-12): Learn with Scooby-Doo and Craig of the Creek. Students consider the attributes of three-dimensional figures, make connections, and use this information to calculate area and volume.



[PBS Kids Shapes Games](#)

The Achievery Lesson [Writing & Advocacy](#) (Gr 9-12): Writing is a powerful tool to use when advocating for change in your community. In this lesson, you will draft an informative email to your local city council or representative, sharing your perspective on an issue you'd like to improve.



The Achievery Lesson [Community Heros](#) (Gr 6-8): Young people have been the beating heart of social change movements for decades. In this lesson, you will learn more about a young person making a positive impact on their community and develop your topic using concrete details and relevant facts.