

Common Core Geometry Hooks Grades 6-12

6th grade

6GA. Solve real-life and mathematical problems involving area, surface area, and volume.



Hook: Bubbles

Blow bubbles (consider coloring bubbles with food coloring or using unpopable bubbles) with a round bubble wand. Review the meanings of area, surface area, and volume with the bubble wand and bubbles.

7th grade

7GA. Draw, construct, and describe geometrical figures and describe the relationship between them.



Hook: Mickey Mouse

Put up pictures of the hidden Mickey Mouses at Disneyland (or Disney World). Ask the students: Who is this? How do you know? Try drawing Mickey Mouse together. How do you make Mickey bigger or smaller, but keep him looking the same? How do you know his ears are the same size? (You can use this activity to lead into congruency, scale drawings, similarity, and constructions.)

Reference: Disneyland Hidden Mickeys <http://findingmickey.squarespace.com/hidden-mickeys-disneyland/> (includes a Hidden Mickey checklist)

Reference: How to Draw Mickey Mouse <http://www.wikihow.com/Draw-Mickey-Mouse>

7GB. Solve real-life and mathematical problems involving angle measure, surface area, and volume.




Hook: More Popcorn


Create 2 rectangular prisms (open bases) made with an $8\frac{1}{2} \times 11$ piece of paper—one should be folded hotdog style and the other should be folded hamburger style. Show the students that when the papers are unfolded that they have the same surface area. (Put one paper on top of the other.) Ask them which prism will have more popcorn. Challenge them to prove their answer by the end of this unit using math. Put the popcorn in the prisms have them measure their amounts to see if they are correct.

Reference: NCTM Illuminations <http://illuminations.nctm.org/>


8th grade


8GA. Understand congruence and similarity using physical models, transparencies, or geometry software.

 Hook: Parent Trap & Austin Powers

 Show a clip from Parent Trap to represent congruency and another clip from Austin Powers to represent similarity.


8GB. Understand and apply the Pythagorean Theorem.


 Hook: PT Origami

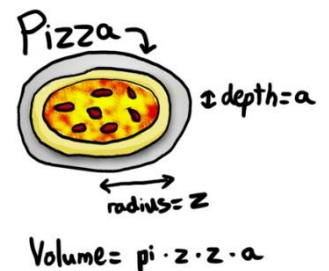
 Fold a square piece of paper to show that the Pythagorean Theorem is true.

Reference: *The Joy of Mathematics* by Theoni Pappas “Mathematics & paperfolding” p.49

8GC. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.


 Hook: Pizza

 Wear a “Volume = pizza” shirt. Volume of a disc with radius= z and depth= a . Ask the students to explain why the volume of pizza is $\pi \cdot z \cdot z \cdot a$.

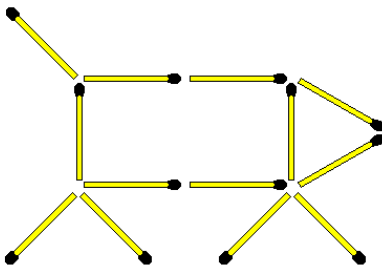


High School

HSG.CO.A. Experiment with transformations in a plane.

 Hook: Oink, Oink

 Rearrange two matchsticks or toothpicks so that the pig faces in the opposite direction.



Reference: *Uncle John's Bathroom Puzzles* p.77 “Oink, Oink”

HSG.CO.B. Understand congruence in terms of rigid motion.



Hook: Spin, Flip, Slide

Look at M.C. Escher Tessellations. What happens with the individual images? How are the pieces alike and different?

HSG.CO.C Prove geometric theorems.



Hook: The Scarecrow

Watch this clip from the Wizard of the Oz in which the Scarecrow receives his diploma 1:29:24-1:30:20. Encourage the students to break apart what he says and write it on the board. Revisit this clip at the end of the unit. Ask the students if what he says makes sense. They should justify their ideas with evidence.

HSG.CO.D. Make geometric constructions.



Hook: ABCs

Tell the story of Durer and Calligraphy/Typography. Ask the students to look at some sample letters and describe how they were made.

Reference: *The Joy of Mathematics* by Theoni Pappas p.16 “Calligraphy, Typography, and Mathematics”

HSG.SRT.A. Understand similarity in terms of similarity transformations.



Hook: Kickball

How many pumps will it take to fill up a playground ball? In addition to enlargement and reduction, you can also discuss volume here.

HSG.SRT.B Prove similarity theorems.



Hook: Similar Triangles Rap

Show students the youtube video “Similar Triangles Rap- The Adventures of Ernie and Stu” at <https://www.youtube.com/watch?v=628eYW4O8hM> by Calford Math. Allusions are made to AA Similarity, Trigonometry, and Congruency.

HSG.SRT.C. Define trig ratios and solve problems with right triangles.



Hook: Irrational Cover Up

Relate the story of Hippasus.

Reference: *The Joy of Mathematics* by Theoni Pappas p.1 “The Irrational Number Cover-up”

HSG.SRT.D. Apply trigonometry to general triangles.



Hook: Crime Scene Investigations

Put blood splatter on white paper taped to the wall. How do you know from what point the blood originated? (String Methodology)

Reference: <http://science.howstuffworks.com/bloodstain-pattern-analysis3.htm>

HSG.C.A. Understand and apply circle theorems.



Hook: Star Trek

Show students the Star Trek Wolf in the Fold episode clip where an evil spirit invades the ship’s computers, but is defeated by pi. Tie this to the idea of all circles being similar.

HSG.C.B. Find arc lengths and areas of sectors of circles.



Hook: Slice of Cake

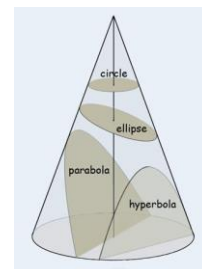
Examine 2 pieces of cake. One slice is from a 10 in cake and has a central angle of 60° and the other is from a 12 in cake and has a central angle of 45° . Which piece is bigger?

HSG.GPE.A. Translate between the geometric description and the equation for a conic section.



Hook: Rice Crispy Cones

Shape rice krispy treats into sno-cone containers. Use a plastic knife to slice them and form a circle, ellipse, parabola, or hyperbola.



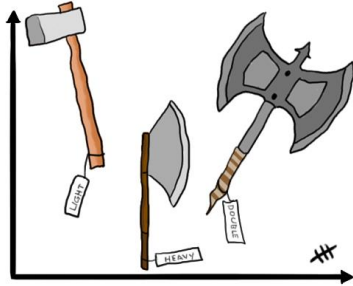
HSG.GPE.B Use coordinates to prove simple geometric theorems algebraically.



Hook: Always Label Your Axes

Put this picture up or print it onto a t-shirt.

Always label your axes



HSG.GMD.A. Explain volume formulas and use them to solve problems.



Hook: Take a Drink

Students must calculate the surface area and volume of a can of soda and then they can drink it.

HSG.GMD.B. Visualize relationships between 2D and 3D objects.



Hook: Flatland

Show students the clip from Flatland where the point, line, and square are restricted by what they can see.

HSG.MG.A. Apply geometric concepts in modeling situations.



Hook: 3D Printers Give a Hand

<http://www.foxnews.com/health/2014/10/19/texas-kindergartner-gets-3d-printer-iron-man-hand/>

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