

SD School Geometry

Teacher's Guide



Welcome to Standard Deviants School Geometry! We've developed our educational package to integrate you, your students, the video components and the supplements into an effective learning method. Here's a quick overview of how Standard Deviants School is structured.

The series is a fun, fast-paced way to teach important concepts of geometry. Each program is 25 minutes long and is broken up into main and sub-sections, as shown in the program guide. Standard Deviants School delivers information in a clear, concise, example-filled manner that teaches from the perspective of a learner. The supplemental materials allow students a quick and effective way to keep notes and monitor their progress.

This program contains the following items:

Teacher's Guide: Overview of the course, plus helpful tips for using the programs.

Program Guide: Outline of the entire video series.

QuikNotes: List of major terms, formulas, equations, and concepts for the program.

QuikCheck: Worksheet suitable as either in-class exercise, homework or as a quiz; includes answer key.

Presentation Tips

Few teachers can choose the AV equipment they use or the amount of students they have in a class, but there are a few steps teachers can take to enhance the viewing process.

- Place television at the center of the longest wall in the room.
- Keep a limit of 5 rows of 5 chairs if possible. Further rows to the sides or rear make it difficult to see the program on an average-sized television. If you are using a video projector, adjust accordingly.
- Position chairs in the outside rows at an angle for optimum viewing, as theater seating is angled around a stage.
- Leave the classroom lights on during the viewing.
- Close window blinds, doors, and other sources of outside light to help reduce glare.

Tips for Teachers

It's important to keep in mind that a video is not a replacement for a teacher. Just like any other classroom tool, used effectively, videos attract students' attention, demonstrate difficult concepts and work well as a change of pace. Used incorrectly, however, they can turn off student interest and disrupt the flow of the class. A few tips while using the video in your classroom:

PRE-VIEWING

- Preview the video before presenting it to the class.
- Go over the QuikNotes with your students and make them aware of the main points they should be looking for in the program and the key concepts they need to learn.
- Explain to students that watching videos in a classroom setting is an active viewing experience, not a passive viewing experience. Active viewing involves absorbing information, thinking critically, asking questions, making connections to previous sections, and making predictions of upcoming sections.

SD School Geometry Teacher's Guide



VIEWING

- Require students to jot down their own notes on their QuikNotes sheet.
- Require students to underline key terms and definitions as they appear in the program.
- Pause the video after each section and check students' comprehension. Review main ideas, recycle vocabulary, solve problems and pose questions.
- Keep the students' learning active and encourage them to discuss topics in between each section.
- Students learn at different speeds. Don't hesitate to rewind and view a section again.

POST-VIEWING

- Review the material covered in the program IMMEDIATELY after watching it. Studies show that within 24 hours, people forget 80% of what they've learned unless they practice and apply their new knowledge.
- Have students define terms, explain concepts, summarize the program or practice the material, either with the accompanying QuikCheck or activities or your own design.
- Have students evaluate the program and supplements. What topics did they think were too difficult? Too easy? Did sections contain too many examples or too few? Do the QuikChecks accurately test student comprehension or not?
- Then challenge students to step into the role of the teacher and come up with their own explanations, examples, and questions.

Good luck and good teaching from the Standard Deviants!

SD School Geometry

Program 6: Figuring out Area



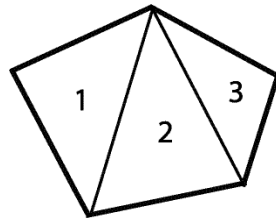
QuikNotes

The **area** of a flat, 2-dimensional figure is the measure of the space inside it.

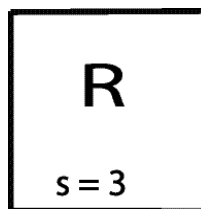
We measure this area in **square units**, because it represents filling the inside with little squares.

The **Area Congruence Postulate** says that if two figures are congruent, then they have the same area. So, if rectangle A is congruent to rectangle B, then their areas are equal.

The **Area Addition Postulate** says that the area of a polygonal region is the sum of the areas of its non-overlapping parts. So the total area of this pentagon is the sum of the area of non-overlapping parts 1, 2, and 3. We find the area of each of these triangles, and add them.



The area of a square is equal to its side length, S , squared. So, the area of square R is side length S squared, or side length S times side length S . So if this square has a side of 3 inches, the area is 3 inches squared, or 9 square inches.



$$A = s^2 = s \times s = 3 \times 3 = 9$$

Student Notes

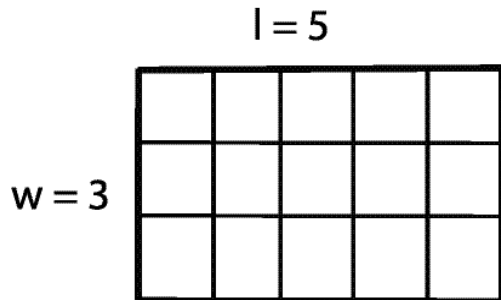
SD School Geometry

Program 6: Figuring out Area

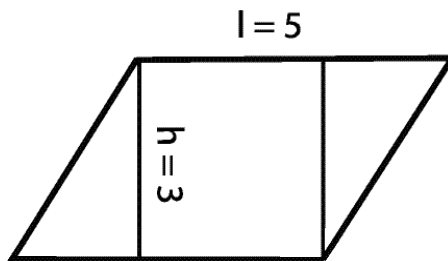


QuikNotes

The **area of a rectangle** is length times width. So for this rectangle we multiply length 5 inches by the width 3 inches. 5 inches times 3 inches equals 15 square inches. Let's take a look at the square inches. Each square on the grid is a square inch. We can count the boxes, and see that we're right; the area is 15 square inches.



A parallelogram's area is the base times the height perpendicular to the base.



The area formula for a trapezoid is: area equals one-half times base 1 plus base 2, times height.

$$A = \frac{b_1 + b_2}{2} \times h$$

The area of a circle equals pi times the square of the radius.

$$A = \pi r^2$$

We approximate π as 3.14

Example: Find the area of this circle with a diameter of 8 feet. The radius will be 4 feet.

$$A = 3.14 \times 4^2$$
$$A = 3.14 \times 16 = 50.24$$

Student Notes



SD School Geometry

Program 6: Figuring out Area

QuikNotes

Surface area is the area of the surface of a three-dimensional object.

Find the surface area by adding the areas of all the sides of the object.

A **cylinder** is just a prism with circles as its bases. Instead of having multiple rectangles as its sides, the portion connecting the two circles is the area of one rolled rectangle.

To find the **surface area of a cylinder**, we add the areas of the circles at the top and bottom, and the area of the rolled up rectangle connecting them.

The width of the rectangle is the same as the circumference, diameter times pi, or $2\pi r$. So the **area of the rectangle** is height times the base, which is diameter times pi, or $2\pi r$.

$$A = 2\pi \times r \times h$$

To get the **surface area of the entire cylinder**, we add the area of the rectangular portion to the area of the two circles.

$$A = (2\pi \times r \times h) + (2\pi r^2)$$

A sphere is a round ball. The **surface area** of a sphere is 4 times the area of a circle, or:

$$A = 4\pi r^2$$

The formula for the **volume of a rectangular prism** is the area of the base, length times width, times the height of the prism.

$$V = l \times w \times h$$

The **volume of a sphere** is $\frac{4}{3}\pi$ times the cube of the radius.

$$V = \frac{4}{3}\pi r^3$$

Student Notes