learning focus:

✓ describe 2D figures that result from slicing 3D figures

✓ determine the volume of prisms

✓ understand and apply volume of rectangular and triangular prisms to real-world situations

VOLUME UNIT
8 DAY CCSS-ALIGNED UNIT

7th GRADE

VOLUME UNIT
Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation & Helpful Hints	
7-16	Binder Covers, Dividers, and Spine Labels	
17-18	Cross Sections of 3D Figures	Student Handout 1
19	Cross Sections of 3D Figures	Homework 1
21-22	Volume of Rectangular Prisms	Student Handout 2
23	Volume of Rectangular Prisms	Homework 2
25-26	Volume of Triangular Prisms	Student Handout 3
27	Volume of Triangular Prisms	Homework 3
29-30	Volume of Prisms Quiz	Quiz 1
31-32	3D Composite Figures	Student Handout 4
33	3D Composite Figures	Homework 4
35-36	Problem Solving with Volume	Student Handout 5
37	Problem Solving with Volume	Homework 5
39-42	Volume Unit Study Guide	Study Guide
43-45	Volume Unit Test	Test

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an 8 day CCSS-aligned unit
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ready-to-go, scaffolded student materials

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student friendly + real-world application

graphic organizers

Unit: Volume
Student Handout 1

Name _____
Date _____ Pd ___

CROSS SECTIONS OF 3D FIGURES

Mac and Jack are each chopping a log shaped like a cylinder to build a campfire. Use the cylinders representing each log below to answer a and b.

a. Mac chops a log in half and the 2D shape he sees is a circle. Sketch a line to show where Mac might have made a cut in his log.

MAC   JACK

b. Jack chops a log in half and the 2D [shape he] sees is a rectangle. Sketch a line [to show] where Jack might have made [a cut.]

CROSS SECTIONS
• A _____
  The shape of the 2D _____
• A figure can be slice[d] _____ the base, or at an _____

The direction of the cut and its effect on _____

PARALLEL TO BASE	PERPEN[DICULAR]
The cross section will match the shape of the _____.	The cro[ss section] the shap[e] face.

In 1-2, describe the direction of the cut a[nd]

1. DIRECTION:

CROSS SECTION:

3. For each 3D figure in a-c, sketch the cross section based on the given direction of the cut.

	PARALLEL TO BASE	PERPENDICULAR TO BASE	AT AN ANGLE
A. RECTANGULAR PRISM			
B. RECTANGULAR PYRAMID			
C. CUBE			

4. Three students each sliced one of the 3D figures shown at the right. Use the clues below to write the name of the student under their figure.

Harper and Randy will have the same cross section shape if they each cut perpendicular to the base of their figure.

S[u...] will [...] pa[...]

5. Antoinette sliced the square pyrami[d]

a. Describe the direction of the cut a[nd]

b. Give an example of another 3D fig[ure] to result in the same cross section

Summarize today's lesson:

Unit: Volume
Homework 1

Name _____
Date _____ Pd ___

CROSS SECTIONS OF 3D FIGURES

Solve each question. Use the letter of each correct answer choice to fill in the corresponding blank(s) of the riddle at the bottom.

1 Which is true about the cross section shown?

I. The cut is parallel to the base.
J. The cross section is a triangle.
K. Both A and B.
L. Neither A nor B.

2 Tony wants to cut the square prism shown in order to create a cross section that is a square. Which direction should he make the cut?

A. Parallel to the base
B. Perpendicular to the base
C. At a diagonal angle
D. Any of the above would work

3 Which of the following could be a possible cross section of a cylinder?

L. A circle
M. An oval
N. A rectangle
O. All of the above

4 Deena is going to slice a triangular prism. If she makes the cut perpendicular to the base, what shape will the cross section be?

A. A triangle
B. A square
C. A rectangle
D. None of the above

5 Scout wants to slice the square pyramid shown to create a cross section that is a triangle. Which direction should she make the cut?

D. Parallel to the base
E. Perpendicular to the base
F. Both choices above would work
G. Neither choice above would work

6 Which is true about the cross section shown?

Q. The cut is parallel to the base.
R. The cut is perpendicular to the base.
S. Both A and B.
T. Neither A nor B.

7 Nina cut a 3D figure perpendicular to the base and the resulting cross section was a rectangle. Which could NOT have been the 3D figure?

F. A rectangular prism
G. A triangular prism
H. A rectangular pyramid
I. A cylinder

8 A cut parallel to the base of the cube shown would have the same cross section as a cut parallel to the base of which figure?

M. A square pyramid
N. A triangular pyramid
O. A cone
P. A cylinder

WHAT IS AN INSECT'S FAVORITE SUBJECT?

___ ___ ___ ___ ___ ___ ___ ___ ___ S
 8   3   6   7   5   8   2   6   1   4

self-checking practice

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streamline your planning process with unit overviews

VOLUME
OVERVIEW

STANDARDS

7.G.6 Solve real-world and mathematical problems involving area, volume. and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

BIG IDEAS

- The volume of a 3D figure is
- Formulas can be used to fin

ESSENTIAL QUESTION

- How are the volumes of a re
- The formulas for finding the process is different. Explain

✓ **key vocabulary**

✓ **vertical alignment**

sample pacing calendar

VOLUME
PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Cross Sections of 3D Figures	Volume of Rectangular Prisms	Volume of Triangular Prisms	Volume of Prisms Quiz	3D Composite Figures
Student Handout 1 Homework 1	Student Handout 2 Homework 2			

DAY 6	DAY 7			
Volume Application	Volume Unit Study Guide			
Student Handout 5 Homework 5	Unit Study Guide			

VOLUME
OVERVIEW

TOPIC	TEACHING TIPS
Rectangular Prisms	• Since volume is the space that a 3D object occupies, there are lots of great hands-on options. From a rubix cube to filling an object with unit cubes, have students explore with their hands. • Search www.pbslearningmedia.org for "Volume of Prisms" to find a few short videos to share. • Students struggle to understand that "B" represents the area of the base. I liked to have students shade the base in each and every problem. Then, sketch the base separate with its dimensions. This helped students to remember to find the area of the base, rather than just using the measurement of the base. • Although many students want to use V = lwh, try to encourage the use of V = Bh for future lessons.
Triangular Prisms	• Using a rectangular prism and a triangular prism with the same height and base measurements, ask students to predict how many triangular prisms can fit inside a rectangular prism. Help connect the B in each formula to the area of each base.
Composite Volume	• This is a great lesson for using unit cubes or other snapping cubes. Students can build various figures and then determine the area of the figure. Students need to be able to understand that even if a portion of the figure is not shown in the picture, it is still a part of the figure and therefore counted in the volume.

teaching ideas

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unit study guide + assessments

✓ quizzes

✓ editable unit test

Unit: Volume
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: VOLUME OF PRISMS

Answer the questions below. Be sure to show your work.

Answers

1. _____
2. _____
3. _____

1. If the rectangular pyramid is sliced perpendicular to the base, which describes the resulting shape of the cross section?

A. A trapezoid
B. A triangle
C. Both A and B are possible
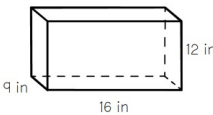D. Neither A nor B is possible

2. Which is a true statement about the cr____ shown?

A. The cut was made parallel to the base.
B. The cross section shape is a circle.
C. Both A and B are true.
D. Neither A nor B is true.

3. Elliott is finding the volume of the trian____ following equations will give him the corre____

A. V = 30(12)   B. V = 15(12)

4. What is the volume of the prism belo____

12 in
9 in
16 in

A. 1,728 in³
B. 300 in³
C. 1,252 in³
D. 864 in³

Unit: Volume
Review

Name _____
Date _____ Pd _____

VOLUME UNIT STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

I CAN DESCRIBE THE 2D FIGURES THAT RESULT FROM SLICING 3D FIGURES.

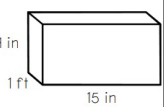1. Describe the direction of the slice and the resulting 2D figure of the cross section.

2. Max is going to slice a cylinder. State the direction he should slice the cylinder in order ____

3. Sofia is going to slice the square p____ shown. Describe the shape of the cr____ section based on the direction of her ____

a. Parallel to the base:

b. Perpendicular to the base:

I CAN DETERMINE THE VOLUME OF RE____

5. The copy paper is delivered to sch____ box with the dimensions shown.

9 in
1 ft
15 in

Area of the base: _____

Height of the prism: _____

Volume of the prism: _____

SEVENTH GRADE CURRICULUM

VOLUME

UNIT NINE: ANSWER KEYS

answer keys included