

learning focus:

- ✓ model the relationship between the volume of a rectangular prism & pyramid
- ✓ model the relationship between the volume of a triangular prism and pyramid
- ✓ determine the volume of prisms and pyramids

VOLUME UNIT 7 DAY TEKS-ALIGNED UNIT



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Name _____
Date _____

RECTANGULAR PYRAMIDS

Use the Venn diagram.

TRIANGULAR PYRAMID



Volume of a rectangular prism and a triangular pyramid

A MANEUVERING THE MIDDLE® RESOURCE

VOLUME



a 7 day TEKS-aligned unit
TEKS: 7.8A, 7.9A, 7.9B

ready-to-go, scaffolded
student materials

VOLUME UNIT

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a 7 day TEKS-aligned unit
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student friendly + real-world
application

scaffolded
concepts

Unit: Volume
Student Handout 3

Name _____
Date _____ Pd _____

VOLUME OF RECTANGULAR PYRAMIDS

A The prism and pyramid have the same dimensions.

$V = 150 \text{ cm}^3$ $V = 50 \text{ cm}^3$

Describe what you notice about set A and of a rectangular prism and a rectangular pyramid.

B The prism and pyramid have the same dimensions.

C The prism and pyramid have the same dimensions.

D The prism and pyramid have the same dimensions.

Each of the cards on the left has the same solution as one of the cards on the right. Find the matching expressions to complete the sentences below.

A $V = \frac{1}{3}(8 \cdot 15)(10)$

B $V = \frac{1}{3}(11 \cdot 17)(8)$

E $V = \frac{1}{3}(8 \cdot 15)(10)$

F $V = \frac{1}{3}(11 \cdot 17)(8)$

Card A and Card _____

Card B and Card _____

Card C and Card _____

Card D and Card _____

Use the figures below to mark each set.

3. Devon is planning to fill two different rectangular pyramids with sand. The sand weighs 1.6 grams per cubic centimeter.

STATEMENT
a. The area of the base of pyramid A is 28 cm^2 larger than pyramid B.
b. If pyramid B was filled with sand, then it would weigh 1,228.8 grams.
c. The combined volume of pyramid A and B is 436 cm^3 .
d. If pyramid A and B are filled with sand, then pyramid A will weigh 1.6 grams more than pyramid B.

Use your understanding of volume to determine the volume, V .

1. $V = \frac{1}{3}(3.5 \cdot 8)(13)$

$B = \frac{1}{3}(3.5 \cdot 8)(13)$

$V = \frac{1}{3}(3.5 \cdot 8)(13)$

self-checking
practice

Unit: Volume
Homework 3

Name _____
Date _____ Pd _____

VOLUME OF RECTANGULAR PYRAMIDS

Set up and solve the questions related to volume of rectangular pyramids. Use the number bank to help you check your solutions. Not all numbers will be used.

1995 10 2 7 9 2.25 54 1.5 3 $245\frac{1}{3}$ 665 4

1. The rectangular prism and rectangular pyramid below have the same volume. Determine the value of x , the height of the pyramid.

$x = \frac{1}{3}(12 \cdot 6)(3)$

2. What is the volume of the rectangular pyramid below?

Volume: $\frac{1}{3}(14 \cdot 9.5)(15)$

3. Determine the missing value, x , of the rectangular pyramid below if the volume is 280 cm^3 .

$x = \frac{3}{14 \cdot 6}(280)$

4. A square pyramid has a base that measures 8 inches on each side. The height of the pyramid is 11.5 inches. Determine the volume of the pyramid.

Volume: $\frac{1}{3}(8 \cdot 8)(11.5)$

5. What is the volume of the square pyramid below if the height is 2 cm?

Volume: $\frac{1}{3}(1.5 \cdot 1.5)(2)$

6. The rectangular prism and rectangular pyramid shown below have the same volume. Determine the value of x , the length of the prism.

Length: $x = \frac{1}{3}(12 \cdot 14)(4)$

VOLUME



a 7 day TEKS-aligned unit
TEKS: 7.8A, 7.9A, 7.9B

streamline your planning process with unit overviews

VOLUME OVERVIEW



READINESS STANDARDS

7.9A Solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids.

SUPPORTING STANDARDS

7.8A Model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas.

7.8B Explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to formulas.

BIG IDEAS

- The volume of a 3D figure depends on the area of its base and its height.
- Formulas can be used to find volumes.

ESSENTIAL QUESTION

- How are the volumes of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids related?
- What are the different variables involved in finding the volume of a 3D figure, and what do they represent?
- How is finding the volume of a 3D figure related to the area of its base?

VOLUME PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Volume of Rectangular Prisms	Volume of Triangular Prisms	Volume of Prisms Quiz	Volume of Rectangular Pyramids	Volume of Triangular Pyramids
Student Handout 1 Homework 1	Student Handout 2 Homework 2			
DAY 6	DAY 7			
Volume Unit Study Guide	Volume Unit Test			
Unit Study Guide	Unit Test			

VOLUME OVERVIEW



TOPIC	TEACHING TIPS
Rectangular Prisms	<ul style="list-style-type: none">• Search www.pbslearningmedia.org for "Volume of Right Rectangular Prisms" for a quick video. If you have time for exploration, allow groups to create their own prism with unit blocks.• This should be a review from sixth grade, including the formula $V=Bh$. Students tend to struggle with "B" as the unit goes on and the base changes shape. Consider printing a class set of measurement charts on cardstock and laminating them so students can become confident using the chart and decoding the variables.
Triangular Prisms	<ul style="list-style-type: none">• It can be hard for students to remember that "B" in the formula requires an extra step of calculating the area of the base. I like to tell students that a capital letter in the formula usually means that there will be work involved to find it.• The biggest challenge is when the triangle is not actually pictured to be on the bottom. Students tend to associate the bottom with the base. Ask students to shade the base of each and every figure and sketch a figure if necessary.
Rectangular Pyramids	<ul style="list-style-type: none">• If you own a set of geometry figures, then take the pyramid and fill it with rice or water. Then, pour the pyramid into the prism to demonstrate that it is only filled one-third of the way.• Check out the blog post on www.maneuveringthemiddle.com entitled "20 Must Have Math Teacher Supplies" for the specific set that I used.
Triangular Pyramids	<ul style="list-style-type: none">• This can be the most difficult figure to calculate the volume. Students should be very familiar with how to substitute the values for each variable and the various steps. Require students to show each and every step.• I really like connecting the triangular prism to the triangular pyramid. Then, it is just one more step. So, students can think of this like finding the volume of a prism and then dividing by three. It sometimes seems a bit less overwhelming.

teaching
ideas



key vocabulary



vertical alignment



sample
pacing
calendar

VOLUME



a 7 day TEKS-aligned unit
TEKS: 7.8A, 7.9A, 7.9B

unit study guide + assessments



quizzes



editable unit test

Unit: Volume
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: VOLUME OF PRISMS

Match the three-dimensional figures to the appropriate volume equation below.

1.

2.

3.

Answers

1. _____
2. _____
3. _____

A. $V = (5)(2.5)$
C. $V = (6.25)(2.5)$
E. $V = (15)(10)$

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

4. What is the volume of the prism below?

A. $1,728 \text{ in}^3$
B. 300 in^3
C. $1,252 \text{ in}^3$
D. 864 in^3

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 MODEL THE RELATIONSHIP BETWEEN THE VOLUME OF A RECTANGULAR PRISM AND A RECTANGULAR PYRAMID. 7.8A

1. Fill out the formulas used to find the volume of a rectangular prism and a rectangular pyramid.

PRISM
$V = \text{length} \times \text{width} \times \text{height}$

PYRAMID
$V = \frac{1}{3} \times \text{length} \times \text{width} \times \text{height}$

3. Describe how the volume of a rectangular prism and a rectangular pyramid are related.

I CAN DETERMINE THE VOLUME OF A RECTANGULAR PRISM.

4. The copy paper is delivered to school in a box with the dimensions shown.

Area of the base: _____

Height of the prism: _____

Volume of the prism: _____

SEVENTH GRADE CURRICULUM

VOLUME

UNIT SEVEN: ANSWER KEYS

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answer keys
included

