learning focus:
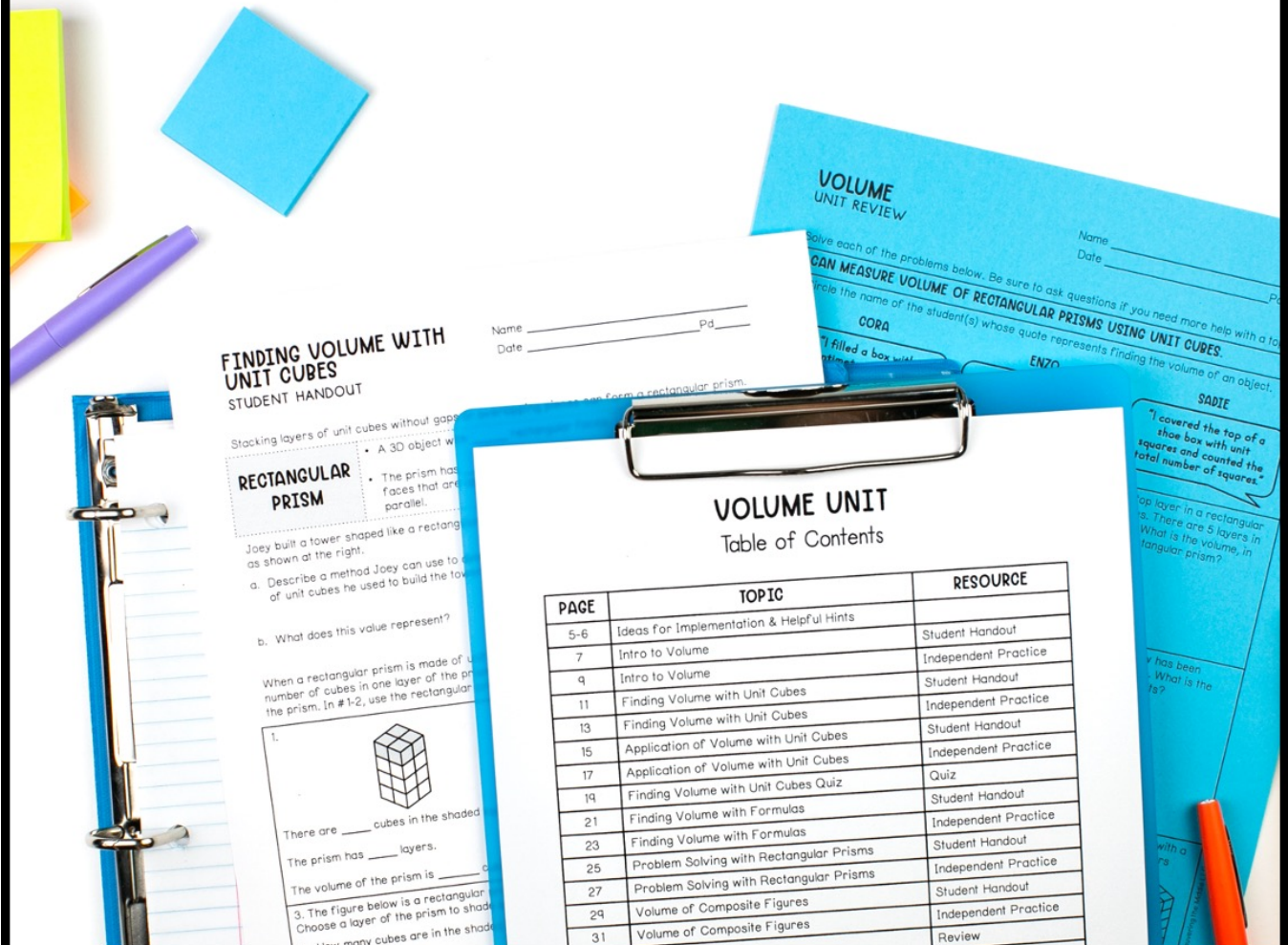
✓ solve problems involving volume with unit cubes

✓ find the volume of rectangular prisms with unit cubes and formulas

✓ determine the volume of composite figures made up of rectangular prisms

VOLUME UNIT 5th GRADE
8 DAY CCSS-ALIGNED UNIT

VOLUME
UNIT REVIEW

Name
Date

VOLUME UNIT
Table of Contents

FINDING VOLUME WITH UNIT CUBES
STUDENT HANDOUT

Name _____ Pd _____
Date _____

Stacking layers of unit cubes without gaps

RECTANGULAR PRISM
- A 3D object w...
- The prism has...
- ...faces that are...
- ...parallel.

Joey built a tower shaped like a rectangular as shown at the right.

a. Describe a method Joey can use to of unit cubes he used to build the tower

b. What does this value represent?

When a rectangular prism is made of number of cubes in one layer of the pr the prism. In #1-2, use the rectangular

1.

There are _____ cubes in the shaded

The prism has _____ layers.

The volume of the prism is _____

3. The figure below is a rectangular
Choose a layer of the prism to shade

CAN MEASURE VOLUME OF RECTANGULAR PRISMS USING UNIT CUBES.

...cle the name of the student(s) whose quote represents finding the volume of an object.

CORA
"I filled a box with...times."

ENZO

SADIE
"I covered the top of a shoe box with unit squares and counted the total number of squares."

...top layer in a rectangular ...s. There are 5 layers in ...What is the volume, in ...tangular prism?

...y has been ...What is the ...ts?

VOLUME

an 8 day CCSS-aligned unit
CCSS: 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5a, 5.MD.5b, 5.MD.5c

5th GRADE

ready-to-go, scaffolded student materials

VOLUME UNIT
Table of Contents

A MANEUVERING THE MIDDLE® RESOURCE

VOLUME

5th GRADE

an 8 day CCSS-aligned unit
CCSS: 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5a, 5.MD.5b, 5.MD.5c

student friendly + real-world application

scaffolded concepts

INTRO TO VOLUME
STUDENT HANDOUT

Name _____
Date _____ Pd _____

Tamar hangs a painting on a wall in her apartment and wants to determine the amount of area it covers using a unit square. Each side of a unit square measures 1 unit and has an area of 1 unit². Find the area of Tamar's painting as shown at the right.

UNIT SQUARE
☐ 1 unit
1 unit

TAMAR'S PAINTING

Area is a helpful measurement for 2D figures. Similarly, volume can be a helpful measurement for 3D figures as described below:

AREA	VOLUME
• The amount of space a 2D object _____ .	• The amount of space a 3D object _____ or the amount of space _____ of a 3D object.
• Area is described using _____ _____ . Each side of a unit square measures 1 unit and has an area of _____.	• Volume is described using _____ _____ . A unit cube has side _____ unit and a volume of one cubic un___
UNIT SQUARE 1 UNIT² ☐ 1 unit / 1 unit	UNIT CUBE 1 UNIT³ 1 unit / 1 unit / 1 unit

Sort cards A-D based on whether they describe finding the area or the volume of an o___

| A | The amount of space inside a fish tank. | B | The amount of floor space a rug covers. | AREA |
| C | The amount of butcher paper used for a banner. | D | The amount of space a box takes up inside a truck. | |

The number of unit cubes that form a figure without gaps or overlaps is equal to the _____ of the figure. The figures in #1-3 are made of unit cubes. Find the volume of each figu___

1.

Volume = _____

2.

Volume = _____

3.

Volume = _____

APPLICATION OF VOLUME WITH UNIT CUBES
INDEPENDENT PRACTICE

Name _____
Date _____ Pd _____

Each of the cards on the left has the same volume as one of the cards on the right. Find the cards with matching volumes to complete the sentences below.

KEY
☐ = 1 cm³

A

E

B
A rectangular prism was built by stacking 3 total layers identical to the base layer shown.

F

C

G
The base layer in a rectangular prism has a length of 9 cm and width of 4 cm. There are 6 layers in this rectangular prism.

D

H

1. Card A and Card _____ have the same volume of _____ cm³.
2. Card B and Card _____ have the same volume of _____ cm³.
3. Card C and Card _____ have the same volume of _____ cm³.
4. Card D and Card _____ have the same volume of _____ cm³.

self-checking practice

VOLUME

an 8 day CCSS-aligned unit
CCSS: 5.MD.3a, 5.MD.3b, 5.MD.4, 5.MD.5a, 5.MD.5b, 5.MD.5c

5th GRADE

unit study guide + assessments

✓ quizzes

✓ editable unit test

FINDING VOLUME WITH UNIT CUBES
QUIZ

Name _____
Date _____ Pd_____

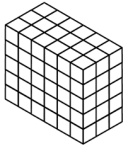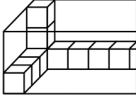Answer the questions below. Be sure to show your work.

1. Which of these could best be measured with unit cubes?

a. The amount of fabric used to cover a bulletin board.
b. The amount of space inside a refrigerator.
c. The amount of space a welcome mat takes up on a porch.
d. The amount of space a calendar take...

Answers
1. _____
2. _____
3. _____

2. The figure shown is made of 1-inch cu...
cubes need to be added to the figure so t...
of 17 cubic inches?

3. The figure shown is a rectangular pris...
What is the volume of the figure?

Figures A-C are rectangular prisms that have been partially packed with 1-inch cubes. Figure B is a cube.

FIGURE A

4. Which figure has a volume of 84 cubic inches?	5. How ... fit insi...
a. Figure A	
b. Figure B	
c. Figure C	
d. Figures A and C	

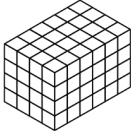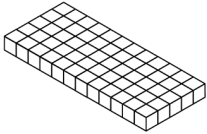### VOLUME
UNIT REVIEW

Name _____
Date _____ Pd_____

Solve each of the problems below. Be sure to ask questions if you need more help with a topic.

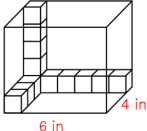#### I CAN MEASURE VOLUME OF RECTANGULAR PRISMS USING UNIT CUBES.

1. Circle the name of the student(s) whose quote represents finding the volume of an object.

CORA   **ENZO**   **SADIE**

"I filled a box with centimeter cubes and counted the total number of cubes."

2. The figure shown is a rectangular... made of 1-centimeter cubes. What is... volume of the figure?

4. A model of a high-rise building wa... blocks that each have a volume of 1... The prism was made by stacking 50... identical to the base layer shown bel... is the volume of the model?

6. Gus and Russell built a rectangular... base layer of 10 cubic units. Russell b... does Gus need for his figure to have...

FINDING VOLUME WITH FORMULAS
STUDENT HANDOUT

Name **Answer Key**
Date _____ Pd_____

The rectangular prism shown below contains several unit cubes that each measure 1 cubic inch. Use the cubes to label the dimensions of the prism and then complete a-b.
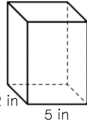
a. Multiply the length and the width (l × w) to determine the number of cubes in the base layer. Use your knowledge of area formulas to describe what this value represents.
6 × 4 = 24; This represents the area of the base.

b. Describe the next step needed to find the volume of the prism.
I need to multiply the area of the base by the height of the prism.

4 in
6 in

Using ___**formulas**___ can be an efficient method to find certain measurements such as volume. Packing a prism with unit cubes helps to visualize and make sense of the formulas that can be used to find the volume of a rectangular prism.
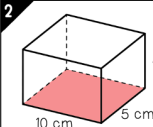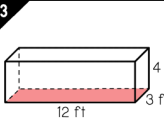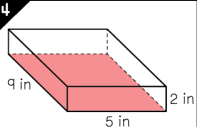
VOLUME OF RECTANGULAR PRISMS	$V = l \times w \times h$	$V = Bh$
	l: __length__ of one base w: __width__ of one base h: __height__ (distance between the two __bases__)	B: area of one base h: __height__ (distance between the two __bases__)

1. Use both formulas to find the volume of the prism. Compare your answers and explain how the formulas relate to each other.

8 in
2 in
5 in

$V = l \times w \times h$	$V = Bh$
$V = 5 \times 2 \times 8$	$V = 10 \times 8$
$V = 80 \text{ in}^3$	$V = 80 \text{ in}^3$

In a rectangular prism the base is a rectangle, so B = l × w. In both formulas the area of the base is being multiplied by the height.

In #2-4, shade the base of the prism and label the height of the prism. Then find the volume.

	2	**3**	**4**
	4 cm 10 cm 5 cm	4 ft 12 ft 3 ft	9 in 5 in 2 in
FORMULA	V = Bh	V = Bh	V = Bh
PLUG-IN VALUES	V = 50 × 4	V = 36 × 4	V = 45 × 2
VOLUME	V = 200 cm³	V = 144 ft³	V = 90 in³

---

answer keys included

A MANEUVERING THE MIDDLE® RESOURCE