LESSON MAKER PRO

Volume Factor Lab

Track how one changed dimension changes volume.

GRADE 7 · 7.MG.1.d

7.MG.1.d "Describe how the volume of a rectangular prism is affected when one measured attribute is multiplied by a factor of 14, 13, 12, 2, 3, or 4, including those in contextual situations."

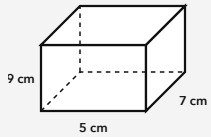
NAME _____ DATE _____

ONE DIMENSION CHANGES

Find volume by multiplying length × width × height. When one dimension is multiplied by a factor, the volume is multiplied by that same factor. A factor less than 1 makes the volume smaller.

WORKED EXAMPLE

The rectangular prism is shown. Its height is multiplied by 4. What is its new volume?



1. Original volume = 5 × 7 × 9 = 315 cm^3.
2. New height = 9 × 4 = 36 cm.
3. New volume = 5 × 7 × 36 = 1,260 cm^3.
4. The volume was multiplied by 4.

Answer: 1,260 cm^3

PRACTICE 4 problems

1 A prism measures 6 cm by 8 cm by 3 cm. Its length is multiplied by 2. Find the new volume.

ANSWER _____

2 A prism has a volume of 400 cm^3. Its width is multiplied by 1/2. What is the new volume?

ANSWER _____

3 A prism measures 12 cm by 10 cm by 6 cm. Its height is multiplied by 1/3. Find the new volume.

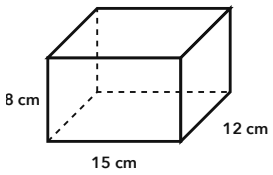
ANSWER _____

4 A prism measures 11 cm by 6 cm by 2 cm. Its width is multiplied by 3. Find the new volume.

ANSWER _____

APPLY IT Show your work

1 A game club's storage box is shown. Its height is multiplied by 1/4. What is the new volume?



ANSWER _____

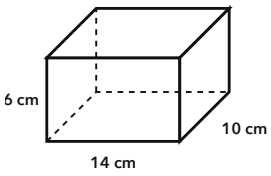
2 A maker club's supply bin has a volume of 1,080 cm^3. For a redesign, its height is tripled while its length and width stay the same. What is the new volume?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The prism is shown. Its length is multiplied by 2 and its width is multiplied by 1/2. Is the volume changed? State the new volume and explain.



WORK SPACE AND ANSWER

ANSWER KEY

Volume Factor Lab

GRADE 7 · 7.MG.1.d

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A prism measures 6 cm by 8 cm by 3 cm. Its length is multiplied by 2. Find the new volume.	**288 cm^3**
2	A prism has a volume of 400 cm^3. Its width is multiplied by 1/2. What is the new volume?	**200 cm^3**
3	A prism measures 12 cm by 10 cm by 6 cm. Its height is multiplied by 1/3. Find the new volume.	**240 cm^3**
4	A prism measures 11 cm by 6 cm by 2 cm. Its width is multiplied by 3. Find the new volume.	**396 cm^3**

PART 2 · APPLY IT

1. **360 cm^3** The original volume is 15 × 12 × 8 = 1,440 cm^3. Multiply 1,440 by 1/4.
2. **3,240 cm^3** Only one dimension is tripled, so multiply the volume by 3.

CHALLENGE

No. The new volume is 840 cm^3 because 2 × 1/2 = 1, so the volume stays the same.

Accept equivalent multiplication reasoning. For the challenge, students must state that the factors 2 and 1/2 have a product of 1.