General Information

Lesson Parts & Duration

Total Duration: 2 to 2 ½ hours

- Segment 1: Volume of Geometric Solids: Introduction to geometric vocabulary and the formula for finding the volume of right rectangular prisms *(45-60 Minutes)*
- Segment 2: Investigating Real Life Problems with Solids *(45-60 Minutes)*
- Segment 3: Activity: Make Your Own Rectangular Prism *(40-60 Minutes)*

Subject(s)

- Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. (5.MD.5)

Objective

- Students will be able to identify the elements of a right rectangular prism: vertex, edge, base, face.
- Students will apply their multiplication and addition skills to find the volume of a right rectangular prism with whole-number edge lengths.
- Students will use the formula V = l x w x h to find the volume of right rectangular prisms in the context of real life and mathematical problems.
- Students will be able to identify right rectangular prisms in the classroom environment, measure their edges and turn them into mathematical problems.

Materials

- pencil & crayons/colored pencils
- blank paper a few per student
- right rectangular prism model or a rectangular tissue box
- document camera/projector or whiteboard
- **Optional:** printable "Exit Slips" (page 12)
- **Optional:** printable "Volume" practice sheet (page 13) (Segment 1)
- **Optional:** printable "Break Up Your Day" brain/movement break ideas (page 14)

Instructional Setting

- Students should be seated with or near another student for partner work.

Throughout these lessons, you will find:

- ***Scripted Text*** indicates things that need to be said directly. Bullets starting with a **"T"** followed by *italicized type* indicate scripted text
- **Clarifiers** within scripted text are in orange
- **Teacher Directions** indicate things you should be doing
- **Side notes** provide helpful hints, ELL strategies, differentiation and information
- **Break Up Your Day** (Brain/Movement Breaks) are in green boxes (at the end)

Remember!

Quality over quantity. All components do not have to be accomplished; lessons may be ended at any time and resumed later.

Instructional Plan: Segment 1: 45-60 minutes

Subject

- Volume of Geometric Solids: Introduction to geometric vocabulary and the formula for finding the volume of right rectangular prisms

Objective

- Students will be able to identify the elements of a right rectangular prism: edge, base, face, vertex.
- Students will apply their multiplication and addition skills to find the volume of a right rectangular prism with whole-number edge lengths.

Materials

- blank paper (2 per student)
- pencil & crayons/colored pencils
- document camera or whiteboard
- right rectangular prism model or a rectangular Tissue box
- **Optional:** printable "Exit Slip" (page 12)
- **Optional:** printable "Volume Practice" (page 13)

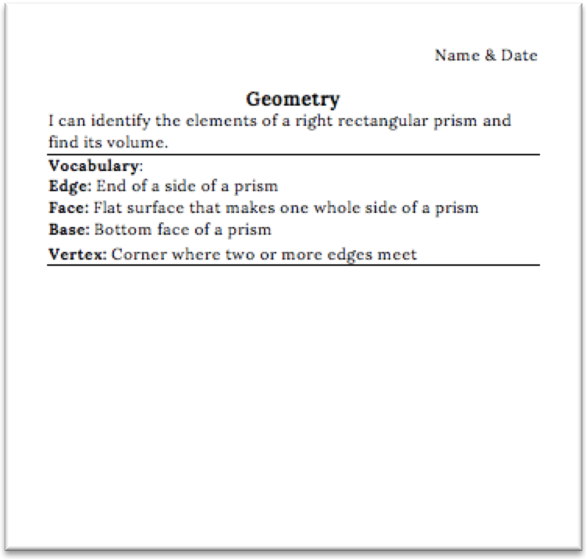
Pass out 2 pieces of paper per student. One will be for "Notes" and the other for practice.

Introduction

T *Today we will explore one of the geometric solids, the right rectangular prism.*
T *Does anyone know what a rectangular prism is and can share with the class?* **Call on students.**
T *A great example of this would be a tissue box.*
T *Although some are shaped more like a cube, most tend to be shaped like a rectangular prism.*
T *We will start by identifying its elements, some of which you might already know.*
T *Then, we will move on to finding the volume of a right rectangular prism using whole numbers.*

Setting up Paper

T *Write your name and date in the top right hand corner of your paper.* **See example & model so students can follow.**
T *On the top center of your paper, title it "Geometry."* **See example & model so students can follow.**
T *Underneath your title write the statement, "I can identify the elements of a right rectangular prism and find its volume."* **See example & model so students can follow.**
T *Below your "I can" statement, write "Vocabulary."* **See example & model so students can follow.**
T *The first vocabulary word we need to know is "edge."*
T *An edge is the side of a prism.* **Point to the edges of the prism.**
T *If you look at each side of the prism, what do you see?* **Call on several students.**

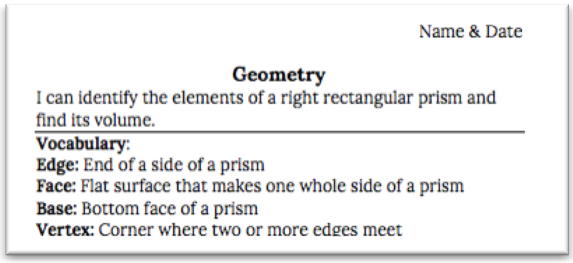

Name & Date

Geometry

I can identify the elements of a right rectangular prism and find its volume.

Vocabulary:
Edge: End of a side of a prism
Face: Flat surface that makes one whole side of a prism
Base: Bottom face of a prism
Vertex: Corner where two or more edges meet

T *Each flat square or rectangle that the prism has; is called a face.*
T *Let's add "face" to the vocabulary list.*
T *A face is the flat surface that makes one side of a prism.*
T *The next word in our list is going to be "base."*
T *Write down "base."*
T *Talk to the person next to you; what do you think is the difference between a "base" and a "face?"* Call on several students. Answer: The bottom face is called a "base." This is true not only for rectangular prisms, but for other solids as well.


Name & Date

Geometry

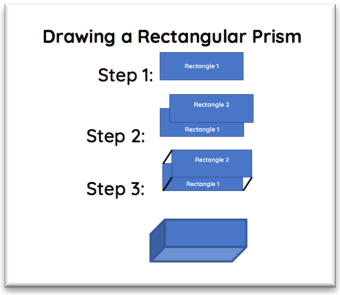
I can identify the elements of a right rectangular prism and find its volume.

Vocabulary:
Edge: End of a side of a prism
Face: Flat surface that makes one whole side of a prism
Base: Bottom face of a prism
Vertex: Corner where two or more edges meet

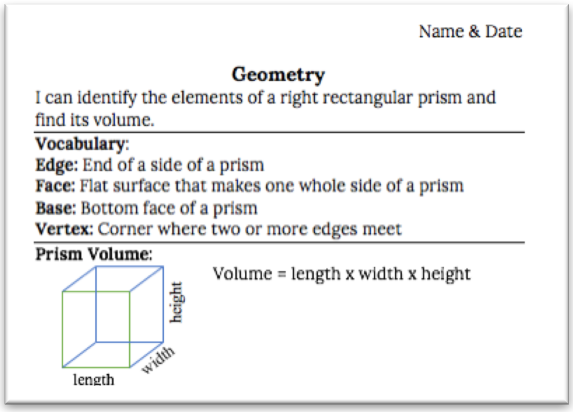
T *Underneath the definition of "base" you can write: "The bottom face of a prism."*
T *Finally, let's write down "vertex."*
T *We have already established what edges, faces, and bases are; let's think for a moment what a vertex might be.* Call on several students. Answer: The corner where two or more edges meet.
T *Let's write that definition down.*
T *A vertex is "the corner where two or more edges meet."*
T *Now that we have all the elements of a right rectangular prism, let's take a look at the model one more time: edge, face, base, and vertex.* Use either a model of a rectangular prism or a rectangular tissue box. Point to each of the vocabulary items corresponding to the model.

Finding the Volume of a Rectangular Prism

T *Moving on, let's consider our model and draw our own rectangular prism in our notes.*
T *Draw a line under your vocabulary words that we just defined and write, "Prism Volume"* Model this so that students can follow.



T *In order to draw a right rectangular prism, we will start by drawing a rectangle.*
T *Then, moving about a quarter of the way up our rectangle and over slightly to the right, we will draw a new rectangle.*
T *Last, we need to connect our corners by drawing 4 lines.*
T *We are now going to explore how to determine the volume of a rectangular prism.*
T *In order to do this, we need to know some measurements of this geometric solid.*
T *To find the volume, one must first know the measurements of the length, the width, and the height of the figure.*
T *Looking at the base of the prism, I can measure each edge.*
T *Let's begin by measuring our base.*
T *For the base, I will measure the length; we will measure across our prism in inches.* Point to the length of the prism model.
T *Let's say that the prism we have drawn is 3 inches in length.* Label the length of the prism you have drawn "3 inches".


Name & Date

Geometry

I can identify the elements of a right rectangular prism and find its volume.

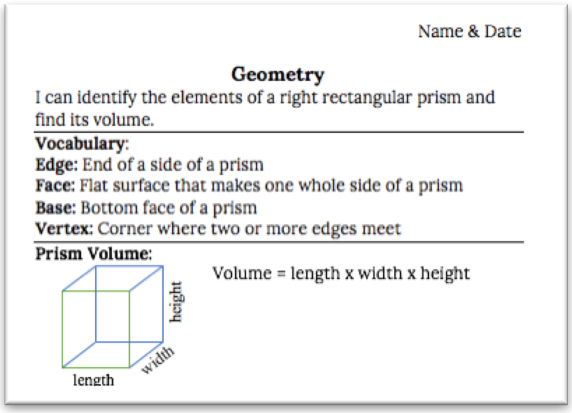
Vocabulary:
Edge: End of a side of a prism
Face: Flat surface that makes one whole side of a prism
Base: Bottom face of a prism
Vertex: Corner where two or more edges meet

Prism Volume:

Volume = length x width x height

T *Now we must determine the width of our prism in inches.*
T *Width means how wide an object is.* Point to the width of the prism model.
T *Let's say that the prisms' width is 2 inches wide.* Label the width of the prism you have drawn "2 inches".

- ***T*** *Let's look at the edge that is going upward.*
- ***T*** *Last, we need to determine the height of our prism.* Point to the height of the prism model.
- ***T*** *Let's say the height of our prism is 4 inches.* Label the height of the prism you have drawn "4 inches".
- ***T*** *Knowing the measurements of the edges, more specifically, the length, width, and the height will let us calculate the volume of the prism.*
- ***T*** *On your paper, write down "Volume = length x width x height"*
- ***T*** *Now let's see how we can apply these measurements to our formula to find the volume of our prism.*
- ***T*** *Think about it for a moment and write down your ideas.*


Name & Date

Geometry

I can identify the elements of a right rectangular prism and find its volume.

Vocabulary:
Edge: End of a side of a prism
Face: Flat surface that makes one whole side of a prism
Base: Bottom face of a prism
Vertex: Corner where two or more edges meet

Prism Volume:

Volume = length x width x height

Give time to complete this task. Monitor students and provide assistance as needed.

- ***T*** *What are your ideas for finding the volume of the prism?* Call on one or two students.
- ***T*** *Do you agree or disagree with those ideas?*
- ***T*** *Let's write these measurements down by following our formula of length x width x height.*
- ***T*** *Using our formula we can calculate the volume in cubic units.*
- ***T*** *Volume = 3 x 2 x 4. V = 24 cubic inches.*
- ***T*** *The shorthand way to write this answer is: 24 in^3*
- ***T*** *Now let's think about that volume of 24 cubic inches.*
- ***T*** *Do you think that two prisms that look different can have the same volume?*
- ***T*** *Write down your ideas and show your work to prove how it either is or is not possible for them to have the same volume.*

Give time to complete this task. Monitor students and provide assistance as needed.

Call on several students to share their answers. Write different possibilities on the board.

- ***T*** *Were you able to see that prisms with different lengths of their edges can have the same volume?*
- ***T*** *This year we will only use whole numbers as the length of the different edges, but in sixth grade, you will be able to use fractions or decimals as well.*
- ***T*** *Let's practice this with another example.*
- ***T*** *With the person sitting next to you, I would like you to see if you could come up with 2 rectangular prisms that would have a volume of 84 cubic inches.*

Give time to complete this task. Monitor students and provide assistance as needed.

- ***T*** *Who would like to share their answers?* Call on students. Possible Answers: 2, 6, 7 & 4, 3, 7 (Several other answers exist. Ensure that the product of the 3 numbers is 84)
- ***T*** *You may have noticed that, your prior knowledge of fact families helped you to know that the order of multiplying the numbers doesn't change the product. The product is the answer to a multiplication equation.*
- ***T*** *So, I can have a length of 2, a width of 6, and a height of 7, giving me a volume of 84 cubic inches.*
- ***T*** *Or I could have a length of 7, a width of 2, and a height of 6, and the product or volume would still be 84 cubic inches.*
- ***T*** *However, you would notice that visually the two rectangular prisms look different.*
- ***T*** *Let's try one more practice independently this time!*
- ***T*** *See if you can find two rectangular prisms with a volume of 72 cubic units.*

Give time to complete this task. Monitor students and provide assistance as needed.

T *Who would like to share their answers?* **Call on students.** Possible Answers: 6, 3, 4 & 3, 3, 8 (Several other answers exist. Ensure that the product of the 3 numbers is 72)

T *Who can tell me a strategy they used to help solve this problem that either worked or did not work?* **Call on students.** They should explain what they did to try to solve the problem and justify why they believe it either worked or did not work.

Differentiation:

For struggling students, you can try to give them 1 or 2 of the variables and see if they can find the other 1 or 2.
For example:
72 cubic units = 6 x __ x ___
-or- 6 x 4 x ___

Draw another right rectangular prism on the board and shade the base.

T *Now let's investigate the formula for volume a little bit more.*

T *Write the formula V = l x w x h.*

T *Let's look at the first part, length times width.*

T *What does this remind you of?* **Call on one or two students.**

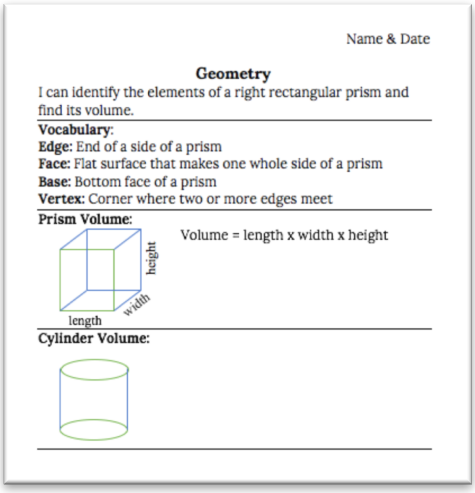
T *We can notice that the volume is equal to the surface area of the base times the height.*

T *So, let's write on the side that Volume = length x width x height and Volume = Base x height.*

T *Do you think that this rule can be applied to other solids as well? Let's explore.*

T *Let's think about a cylinder as the title of the next section.*

T *Let us draw a circle for a base of another solid, but this time we will not make a prism, but a cylinder.* Model this step so students can follow along with your example. Shade the circle.


Name & Date

Geometry

I can identify the elements of a right rectangular prism and find its volume.

Vocabulary:
Edge: End of a side of a prism
Face: Flat surface that makes one whole side of a prism
Base: Bottom face of a prism
Vertex: Corner where two or more edges meet

Prism Volume:

Volume = length x width x height

Cylinder Volume:

T *What differences do you notice between a prism and a cylinder?*

T *Can we use the same formula for volume, Volume = length x width x height –or– Volume= base x height to determine the volume of a cylinder?*

T *Turn and talk about this with a partner sitting next to you, remember to defend your answer with explanations.*

Give time to complete this task. Monitor students and provide assistance as needed.

Call on several students to share their answers.

T *It looks like we cannot determine the volume of a cylinder using the same formula because there are no "edges" for us to measure!*

T *If we wanted to find the volume of a cylinder we would need to use a different formula to determine the area of a circle, because a circle is the base of a cylinder.*

T *At the beginning of this lesson I told you that today we would be using a formula to determine the volume of rectangular prisms, so we will not be determining the volume of a cylinder today.*

T *What I would like to do is to have you practice a few more examples either independently or with a partner.*

T *After you finish these examples, you can create some of your own for a partner or another student in class to try to solve!*

On your feet/ Get ready to meet/ Go and Greet (should take less than one minute)

- Students stand up and put their hand up in the air
- Students find another student that has their hand up to have a "new" partner (and get them moving around)
- Once they are with their new partner, they put their hands down and face the teacher

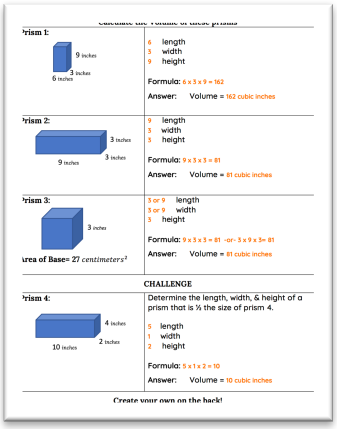
T *Remember the units of a measurement are very important.*

T *Does anyone remember what units we were using earlier?* **Call on students. Answer: cubic inches.**

T *Please remember that when working with a partner both partners should be doing equal amounts of work.*

T *For problems like these, I would suggest trying to solve each first independently, and then share and discuss your answers.*

T *If we have time at the end, I will go over the answers with you as a whole class, otherwise I will collect your papers and leave them for your teacher to see your work!*


Prism 1:
9 inches
3 inches
6 inches
6 length
3 width
9 height
Formula: 6 x 3 x 9 = 162
Answer: Volume = 162 cubic inches

Prism 2:
3 inches
9 inches
3 inches
9 length
3 width
3 height
Formula: 9 x 3 x 3 = 81
Answer: Volume = 81 cubic inches

Prism 3:
3 inches
Area of Base= 27 centimeters²
3 or 9 length
3 or 9 width
3 height
Formula: 9 x 3 x 3 = 81 -or- 3 x 9 x 3= 81
Answer: Volume = 81 cubic inches

CHALLENGE

Prism 4:
4 inches
10 inches
2 inches
Determine the length, width, & height of a prism that is ⅕ the size of prism 4.
5 length
1 width
2 height
Formula: 5 x 1 x 2 = 10
Answer: Volume = 10 cubic inches

Create your own on the back!

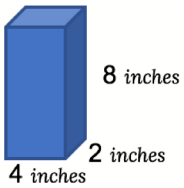
Pass out printable volume practice (page 13) –or- project it for students to copy.

You may use the exit slip at the end of this lesson as a quick assessment of student understanding. Either print them out, or simply have students copy the problems on a half sheet of paper

Name: _ANSWER KEY_____Date: _____

Exit Slip: Segment 1

1) Determine the volume of the rectangular prism by identifying its length, width, and height.

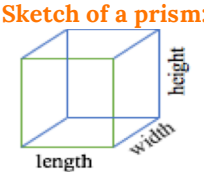


4 length
2 width
8 height
Formula: 4 x 2 x 8 = 112
Answer: Volume = 112 cubic inches

2) Two right rectangular prisms have the same volume of 108 cubic inches.

a. Draw two different possibilities and label the edges respectively so that the volume is the same.
b. Plug in the numbers to check your answer.

Answers will vary based on the number students select.
Sketch of a prism:



As long as the answers are factors of 108 and when multiplied give the correct volume, the student will receive full credit.
For example, 108 = 4 x 3 x 9, so length = 4, width = 3, height = 9.
108 = 2 x 6 x 9, so length = 2, width = 6, height = 9.

Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.

See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 14)

Instructional Plan: Segment 2: 45-60 minutes

Subject

- Investigating Real Life Problems with Solids

Objective

- Students will use the formula V = l x w x h to find the volume of right rectangular prisms in the context of real life and mathematical problems.
- Students will be able to identify right rectangular prisms in the classroom environment, measure their edges and turn them into mathematical problems.

Materials

- blank paper (1 per student)
- rulers (1 per two students)
- pencil & crayons/colored pencils

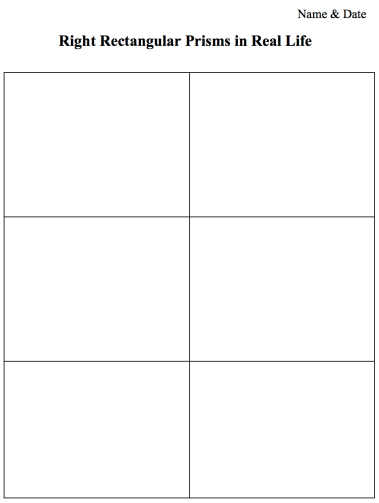
Before passing out any materials, explain the hands-on activity by giving specific step-by-step directions to the students.

Introduction

T *Today we will be building upon what we learned about right rectangular prisms.*
T *Let's quickly remind ourselves, what is a rectangular prism?* **Call on students to share.**
T *What are the elements of a right rectangular prism?* **Call on students to share.** **Answer: edge, face, base, vertex.**
T *Since we already know what rectangular prisms look like, I am sure that we can find examples of them all around us.* **Hand out one piece of blank paper per student.**

Directions for the Activity

T *Write your name and date in the top right hand corner of your paper.* **See example & model so students can follow.**
T *Write the title: Right Rectangular Prisms in Real Life.*
T *We are going to work in pairs and explore the classroom environment to find examples of right rectangular prisms.*
T *Divide your paper into 6 boxes. Each box will represent one item from your investigation.* **See example & model so students can follow.**
T *You and your partner should find a total of 6 rectangular prisms, draw a sketch in the corresponding box, and label the item.*
T *Then, you and your partner will use a ruler to measure the edges of each rectangular prism and record it in the same box.*
T *For example, I see that tissue box and decide to use it as my first example of a rectangular prism in my classroom environment.*
T *I will draw a sketch and label the item in the first box on my paper.* **See example & model so students can follow.**
T *Then, I will use the ruler to measure the edges of the tissue box and record them in the same box.*

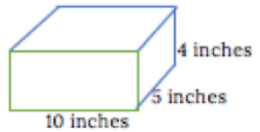


T *Since we are still using whole numbers for our edges, I will round to the nearest unit.*
T *First I will measure the length of the tissue box.*
T *It looks like the length is 10 inches.*
T *Next, I will measure the width.*
T *When rounding to the nearest inch it looks like the width is 5 inches.*
T *Last, we will measure the height of the tissue box.*
T *The height I measured is 4 inches.* **See example & model so students can follow.**

- ***T*** *Even though you and your partner will have the same six items because you are working together, I will expect each person to create an individual report sheet with the items from your exploration with your partner.*
- ***T*** *After you identify, sketch, label and record the measurements, you will find the volume of each right rectangular prism using the formula.*
- ***T*** *So, let's recap, we need to follow four steps for recording our findings of right rectangular prisms in our classroom environment.* Use fingers to recap. 1, 2, 3, 4.
- ***T*** *1) Identify shape, 2) Sketch it on your piece of paper, 3) Label the elements of the prism, and 4) Record the measurements of the object.*
- ***T*** *Now, let's go back to the formula we studied previously.*
- ***T*** *Can someone remind me what the formula for finding the volume of a rectangular prism is?* Call on one or two students.
- ***T*** *My tissue box has dimensions of 5 inches by 10 inches by 4 inches.*
- ***T*** *I will calculate the volume by multiplying the three numbers.*

Name & Date

Right Rectangular Prisms in Real Life

Kleenex box  V = 10 x 5 x 4 = 200 inches^3	

- ***T*** *My result will be 200 in^3.*
- ***T*** *Who can remind me why I write a little 3 as a superscript after inches, a superscript looks like an exponent?* Call on a student to answer. Answer: the superscript 3 stands for the unit for volume -- cubic inches.
- ***T*** *You will work on finding the volume of the six items individually.*
- ***T*** *Once you are done with all six items, make sure you check your work and then share it with your partner.*
- ***T*** *After you are done comparing your answers, we will get back together and share your findings.*
- ***T*** *Any questions before we put our detective hats on?* Give a few seconds wait time before giving out rulers.

Give time to complete this task. Monitor students and provide assistance as needed.

- ***T*** *Now that you had some time to look around the classroom and identify and record your findings, let us take some time to share your findings.*
- ***T*** *Who would like to begin? If you have the same item on your list, show me a thumb instead of interrupting your friends.* Call on a student from each group to answer. Write their ideas on the board.
- ***T*** *Ok, can you also tell me how you found the volume of these objects?* Record steps on the board. Repeat with more volunteers.
- ***T*** *Thank you to those of you who volunteered to share. Now I would like to collect your papers.*
- ***T*** *Make sure they have your name.* Collect papers and use them as exit slips for this segment. Give them to the teacher to review later on.
- ***T*** *Great! Now that we have seen so many examples we can finish this lesson with a bit of movement!*
- ***T*** *So, let's get up and stretch.*

Make sure to "Break Up Your Day!"

Now is a great time to take a break and get students re-energized.

See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 14)

Instructional Plan: Segment 3: 40-60 minutes

Subject

- Activity: Make Your Own Rectangular Prism

Objective

- Students will be able to identify the elements of a right rectangular prism: vertex, edge, base, face.
- Students will apply their multiplication and addition skills to find the volume of a right rectangular prism with whole-number edge lengths.
- Students will use the formula V = l x w x h to find the volume of right rectangular prisms in the context of real life and mathematical problems.

Materials

- blank paper
- pencil & crayons/colored pencils
- rulers
- projector
- computer
- whiteboard & markers
- **Optional:** "Moving Truck... Volume of a Rectangular Prism" video on YouTube by the AllAroundMathGuy

This lesson can be done using this video link https://www.youtube.com/watch?v=IJt4RgvDyoI Or, if you have access –or- you can use the verbal recap option. Below you will find "Introduction with Video" & "Introduction without Video.".If using the video, we suggest that you test the link on your computer first to ensure you can access it on the school district's network without being blocked. If the video does not work, simply follow the "Introduction without Video" for the students.

Introduction with Video

T *Today we will be talking about rectangular prisms and build upon what we already know about them.*
T *Let's start by watching this video:* https://www.youtube.com/watch?v=IJt4RgvDyoI .
T *Listen to what the person is going to explain and we will discuss it afterwards. You can take notes if you want to help yourself remember something.* **Play video from the link above.**
T *Ok, let's make a chart on the board.*
T *We will have two columns – things we noticed and things we wonder about.* Draw two columns on the whiteboard. One should be called "I noticed" and the other one "I wonder."
T *Turn to your partner and share one thing that you noticed and then one thing that you wonder about from the video.* **Give students a minute or two.**
T *Who would like to share what you and your partner noticed?* **Call on a few students and write down their statements in the left column: I noticed.**
T *So, after all these things that you noticed, what about things that you or your partner wonders about?*
T *Let's take a moment to write some wonderings on the board.*
T *Who would like to share?* **Call on a few students and write down their statements in the left column: I wonder.**

Introduction without Video This is a recap of what is covered in the video.

T *Today we will be talking about rectangular prisms and build upon what we already know about them.*
T *I saw this video once about a guy who was helping someone move.*
T *He was using a box truck.*
T *Does anyone know what a box truck is?* **Call on students to share ideas.** If no one seems to know, clarify what it looks like for them. A box truck is a truck that essentially has a back end that looks like a box or a rectangular prism.
T *A box truck is what you typically see people using when they are moving.*

- ***T*** *The back part of the truck is a rectangular prism.*
- ***T*** *When movers determine how much a box truck can hold, they are identifying the box portion of the trucks volume.*
- ***T*** *In the video, the All Around Math Guy brings out what looks like a moving box.*
- ***T*** *He says that when volume is being measured they are essentially trying to see how many of a certain size of box will fit inside of the rectangular prism.*
- ***T*** *So essentially these would be your units of measurement.*
- ***T*** *You could have cubic inches, meaning a cube where every side is 1 inch in length.*
- ***T*** *You could have cubic feet, cubic yards, etc.*
- ***T*** *So, then the man opens up the back of the truck and gets in the box part.*
- ***T*** *The truck is currently empty and he decides to measure the length of his truck.*
- ***T*** *He measures 16 feet in length and tells us that it makes sense because when he rented it he rented a 16 ft truck.*
- ***T*** *Then he proceeds to measure the width of the truck.*
- ***T*** *This truck had a width of 8 feet.*
- ***T*** *Last, he measures the height of the truck.*
- ***T*** *The last dimension of the truck is 7 feet in height.*
- ***T*** *He then uses those actual measurements to find out the volume of the inside of his truck.*
- ***T*** *He illustrates this using a cube to stand for a box.*
- ***T*** *The box is 1 cubic foot, which means the length, width, and height of this box are all 1 foot in length.*
- ***T*** *He decides he will first examine how many of these 1 cubic foot boxes would fit on just the floor of the truck.*
- ***T*** *He identifies that the floor of his truck is the base and that he needs to find out the area of that base.*
- ***T*** *The base of the truck is 16 feet long and 8 feet wide.*
- ***T*** *He then uses a cool web link to illustrate how you can put cubes inside of a rectangular prism.*
- ***T*** *He does this with a smaller prism first and then shows how you can essentially use the area of the base and continue to stack layers to equal the correct height.* **Draw this on the board so students can see what you mean by layers.**
- ***T*** *To find the area he needs to multiply 16 x 8= 128 sq feet.*
- ***T*** *The bottom layer has 128 boxes.*
- ***T*** *Since his truck is 7 feet in height, there will be 7 layers, each foot is a layer.*
- ***T*** *So, 1 layer is 128 boxes, multiplied by 7 gives us 896 boxes total!*

Real Life Application

- ***T*** *The man's box truck, is one example of a real life rectangular prism.*
- ***T*** *The reason someone would want to find the volume of that rectangular prism would be to find out how many boxes they can fit inside the truck when moving.*
- ***T*** *Let's think about other big objects outside of our classroom that are made of rectangular prisms.*
- ***T*** *Let's list a few of your ideas.* **Write some ideas on the whiteboard. If nobody says "houses," suggest it as an idea and write it down as well.**
- ***T*** *I think that now we are ready to use your creativity!*
- ***T*** *Each one of you is going to plan and design your own dream house.*
- ***T*** *The requirements are that it is composed only of right rectangular prisms and that you use whole numbers for the sides of each prism. You should have at least 2 prisms in your house.*

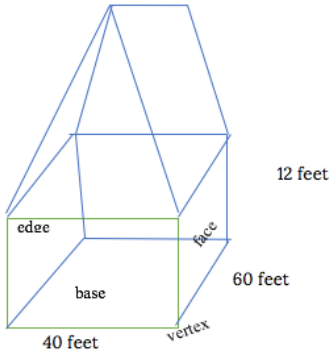
- ***T*** *Try to create a 3D representation on a blank piece of paper, label the parts of the prism that we already know. What are they?* Call on a few students. Answer: edge, vertex, base, face.
- ***T*** *You can design your house as you like and include the layout of each story.*
- ***T*** *Estimate the length, width, and height of each prism and write them down.*
- ***T*** *Then, you will use the formula for volume of a right rectangular prism for each of the prisms you have planned for the house.*

Setting up Paper

- ***T*** *The paper that you will turn in will look similar to this. You will put your name and the date in the right hand corner and write the title – Dream House Design.* See example & model so students can follow.
- ***T*** *Then, you will plan and design your house.*
- ***T*** *This is the time to be creative! Make it colorful and interesting!*
- ***T*** *My house has only one prism, just because I don't want to influence your ideas.*
- ***T*** *However, remember you need to use at least three!*
- ***T*** *Also, don't forget to label the length of each edge, as I have done in the model.* See example & model so students can follow.
- ***T*** *Don't worry about the roof space for now; we can work on this once we learn how to find the volume of a pyramid.*
- ***T*** *For now, we will focus only on the rooms made of rectangular prisms.*
- ***T*** *Time to create your dream house! Make it big and detailed!*

Name & Date

Dream House Design



Volume = length x width x height

Volume = 40 x 60 x 12 = 28,800 ft^3

Give time to complete this task. Monitor students and provide assistance as needed.

- ***T*** *After you are done with the dream house designs, I will collect your papers.* Collect papers and use them as exit slips for this segment. Give them to the teacher to review.
- ***T*** *Eyes on me in 5...4...3...2...1...0. Thank you! We are done with this lesson, so let us get up and move around a little bit!*

Differentiation:

Some students might finish faster than others. Those who are ready can think of furniture inside of the house using rectangular prisms and extend the activity.

Make sure to "Break Up Your Day!"

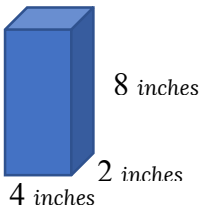
Now is a great time to take a break and get students re-energized.

See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 14)

Name: _____Date: _____

Exit Slip: Segment 1

1) Determine the volume of the rectangular prism by identifying its length, width, and height.



_____ length
_____ width
_____ height
Formula: _____
Answer: Volume = _____

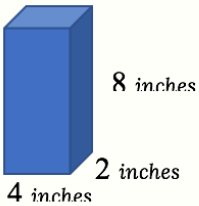
2) Two right rectangular prisms have the same volume of 108 cubic inches.

a) Draw two different possibilities and label the edges respectively so that the volume is the same.
b) Plug in the numbers to check your answer.

Name: _____Date: _____

Exit Slip: Segment 1

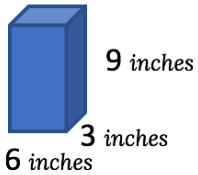
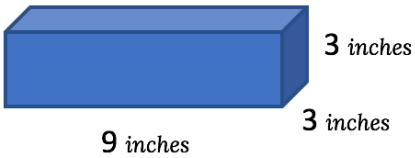
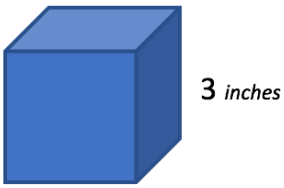
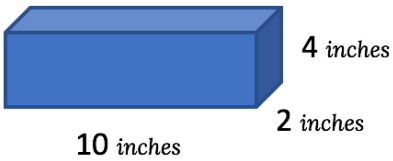
1) Determine the volume of the rectangular prism by identifying its length, width, and height.



_____ length
_____ width
_____ height
Formula: _____
Answer: Volume = _____

2) Two right rectangular prisms have the same volume of 108 cubic inches.

a) Draw two different possibilities and label the edges respectively so that the volume is the same.
b) Plug in the numbers to check your answer.

Calculate the Volume of these prisms	
Prism 1:  	_____ length _____ width _____ height Formula: _____ Answer: Volume = _____
Prism 2:  	_____ length _____ width _____ height Formula: _____ Answer: Volume = _____
Prism 3:  **Area of Base= 27** $centimeters^2$	_____ length _____ width _____ height Formula: _____ Answer: Volume = _____
CHALLENGE	
Prism 4:  	Determine the length, width, & height of a prism that is ½ the size of prism 4. _____ length _____ width _____ height Formula: _____ Answer: Volume = _____
Create your own on the back!	

Make sure to "Break Up Your Day!"

These can be used in the middle of a lesson or at the end of your lesson.

Here are a few engaging movement and brain break ideas to get your students moving and ready to refocus!

Break Up Your Day: Math Outside!

- Students take scratch paper/pencil and find multiplication problems outside.
- Students write multiplication problems they see on the playground. (examples: 3 basketball courts times 6 students equals 18 basketball players, four hopscotches times 5 students equals 20 students playing hopscotch.)

Break Up Your Day: Thumbs Up!

- Student is called on (use name cards or equity cards if available) to state a rounding observation from within the classroom using numbers from 1 to 500.
- Other students signify whether they understand and agree with the observation. (Example: "There are approximately 100 pencils in the classroom because each student has 3 pencils and there are 32 students. 3 times 32 is 96 and 96 rounds to 100.)
- Tally how many students agree with the rounding statements.
- The statement with the most votes or Thumbs Up is the "Round Up Captain"!

Break Up Your Day: Body Stretches!

10 minutes
FORMATION: Standing at desks

- Have students begin the day with a series of simple activities lasting 30 seconds or more: jumping jacks, knee lifts, flap arms like a bird, hopping, scissors (feet apart then cross in front, feet apart then cross in back)…
- Follow each activity with a basic stretching movement:
- Reach for the sky runner's stretch
- Butterfly stretch (sit with bottom of feet together)
- Knee to chest, rotate ankles, scratch your back

Hold stretches for 10 - 30 seconds. Repeat a different simple activity followed by a new basic stretch as many times as desired.