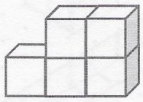
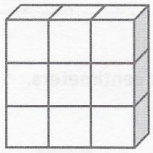
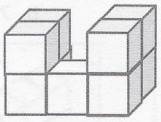
Name _____ Date _____

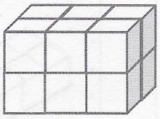
1. Use your centimeter cubes to build the figures pictured below on centimeter grid paper. Find the total volume of each figure you built, and explain how you counted the cubic units. Be sure to include units.

A. 

B. 

C. 

D. 

E. 

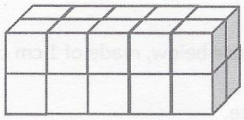
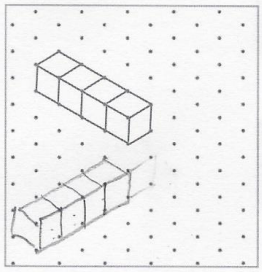
F. 

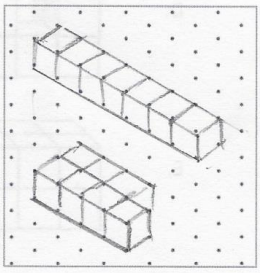
Figure	Volume	Explanation
A	1 cm^3	It's only one cube
B	5 cm^3	There are 5 cubes
C	9 cm^3	6 in front, 6 in the back
D	9 cm^3	5 in front, 4 in back
E	12 cm^3	6 in front, 6 in the back
F	20 cm^3	10 in front, 10 in the back

2. Build 2 different structures with the following volumes using your unit cubes. Then, draw one of the figures on the dot paper. One example has been drawn for you.

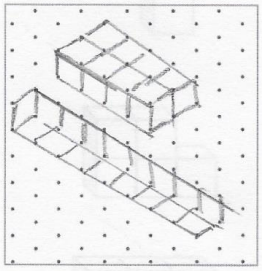
a. 4 cubic units



b. 7 cubic units



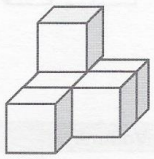
c. 8 cubic units



3. Joyce says that the figure below, made of 1 cm cubes, has a volume of 5 cubic centimeters.

a. Explain her mistake.

There is one cube that is not seen. It is placed below the one standing out.

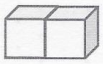


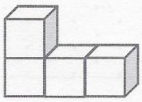
b. Imagine if Joyce wants to build a second layer of the same structure identical to the figure above. What would its volume be then? Explain how you know.

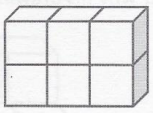
The volume would be 12 cm^3. There are 6 cm^3 in the lower level. So there would be 12 cm^3 in two layers.

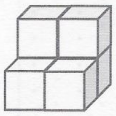
Name _____ Date _____

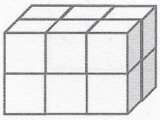
1. The following solids are made up of 1 cm cubes. Find the total volume of each figure, and write it in the chart below.

A. 

B. 

C. 

D. 

E. 

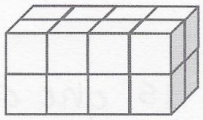
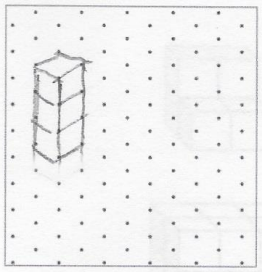
F. 

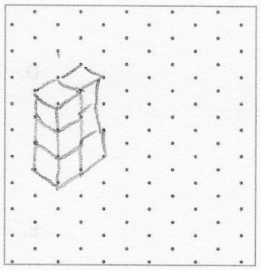
Figure	Volume	Explanation
A	2 cm^3	There are 2 cubes
B	4 cm^3	There are 3 in the lower, 1 in the upper level.
C	6 cm^3	3 in the lower level, 3 in the upper.
D	6 cm^3	4 in the lower level, 2 in the upper
E	12 cm^3	6 in the front, 6 in the back
F	8 cm^3	4 in the front, 4 in the back

2. Draw a figure with the given volume on the dot paper.

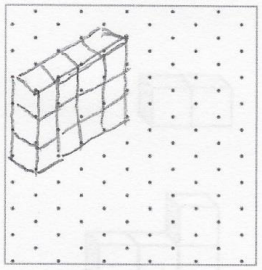
a. 3 cubic units



b. 6 cubic units

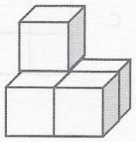


c. 12 cubic units

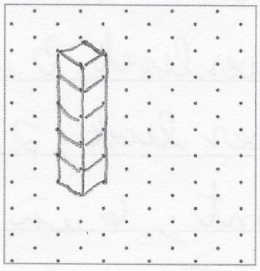


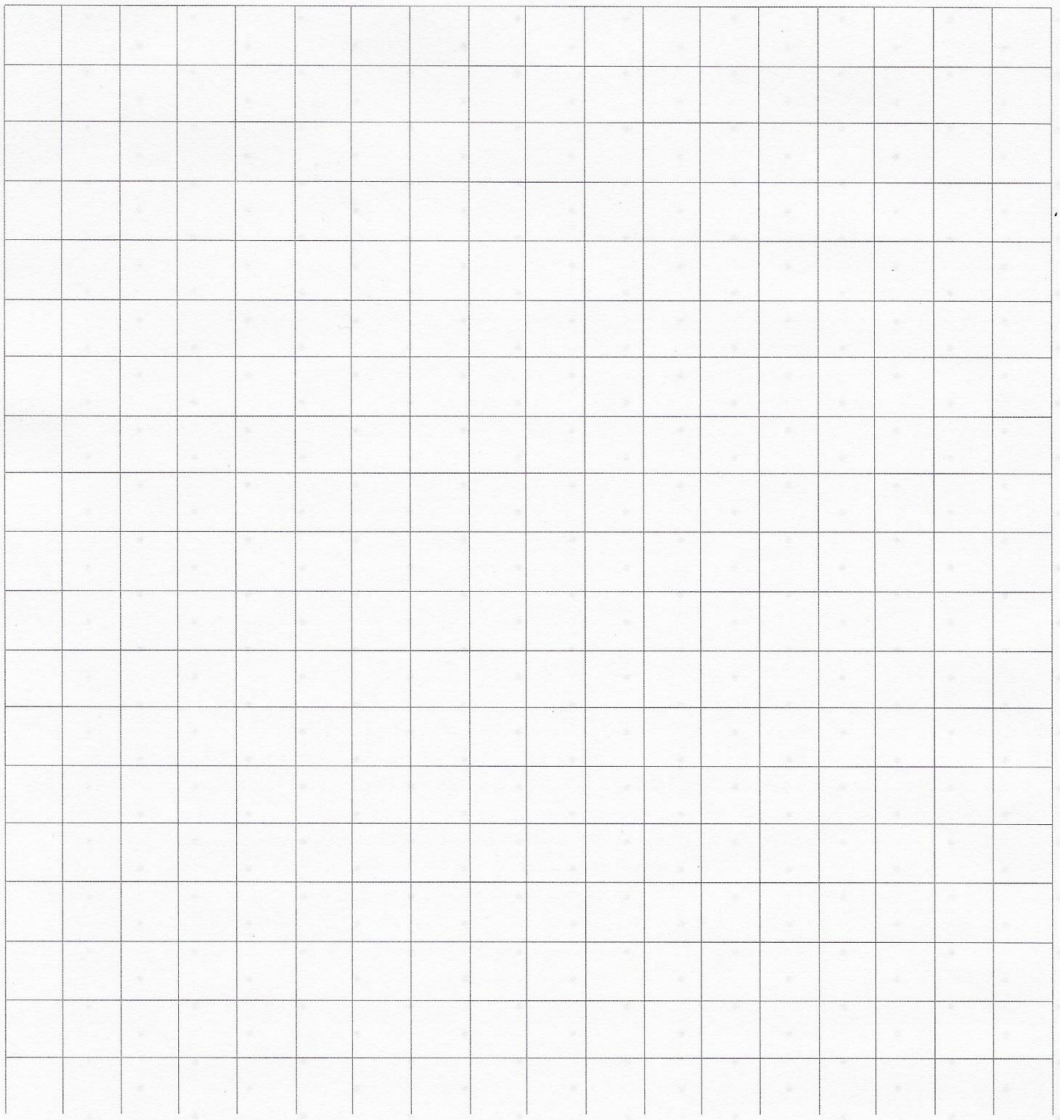
3. John built and drew a structure that has a volume of 5 cubic centimeters. His little brother tells him he made a mistake because he only drew 4 cubes. Help John explain to his brother why his drawing is accurate.

There is one cube under the one standing out

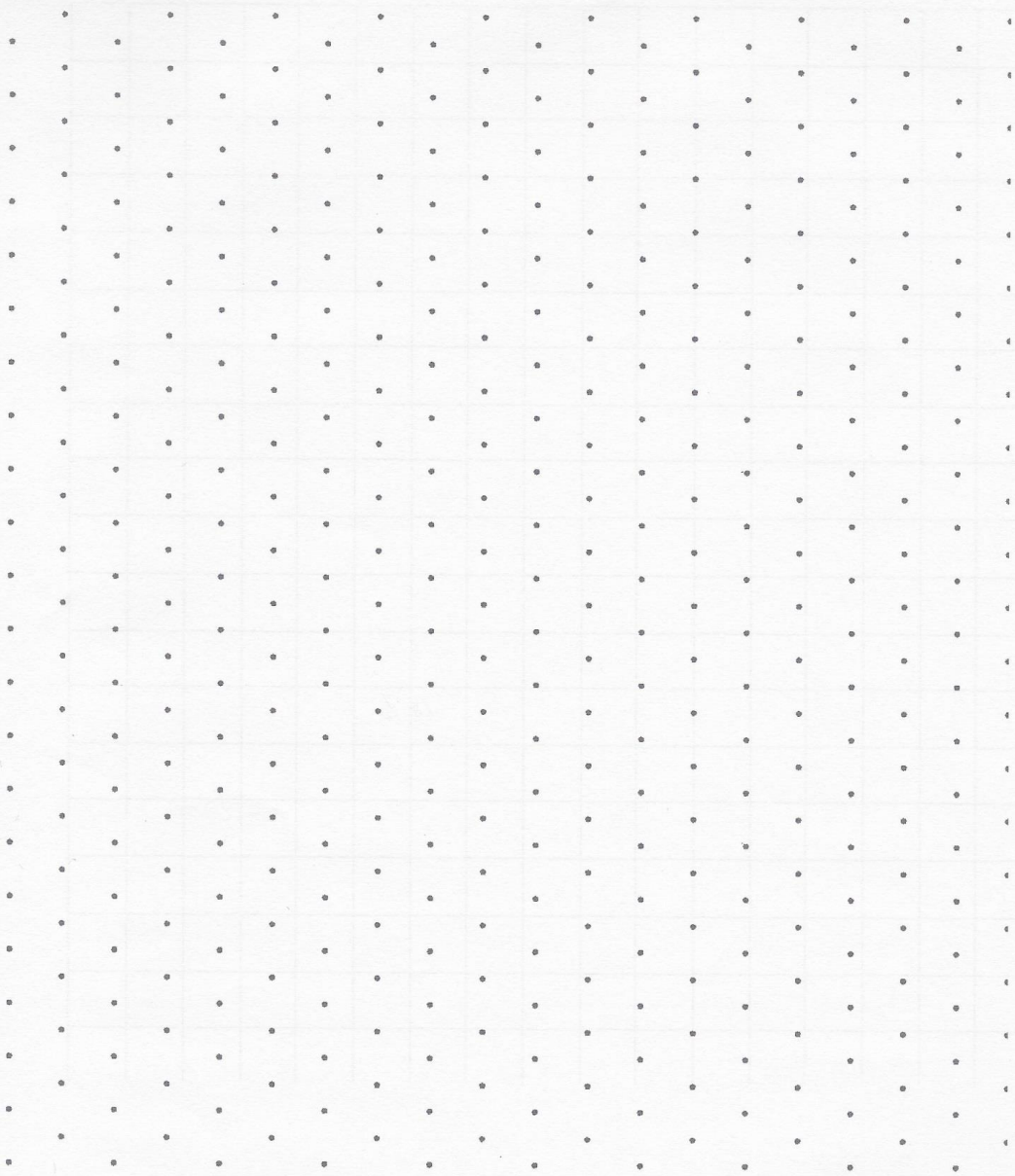


4. Draw another figure below that represents a structure with a volume of 5 cubic centimeters.





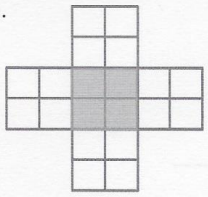
centimeter grid paper



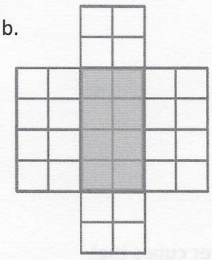
isometric dot paper

Name _____ Date _____

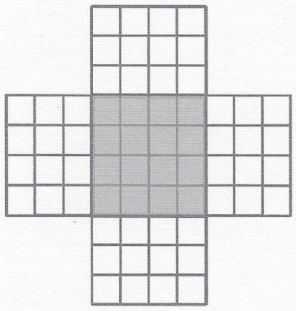
1. Shade the following figures on centimeter grid paper. Cut and fold each to make 3 open boxes, taping them so they hold their shapes. Pack each box with cubes. Write how many cubes fill the box.

a. 

Number of cubes: 8

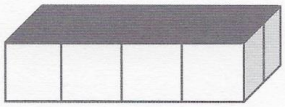
b. 

Number of cubes: 16

c. 

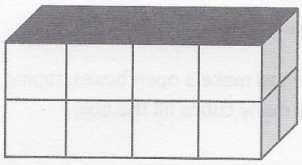
Number of cubes: 48

2. Predict how many centimeter cubes will fit in each box, and briefly explain your prediction. Use cubes to find the actual volume. (The figures are not drawn to scale.)

a. 

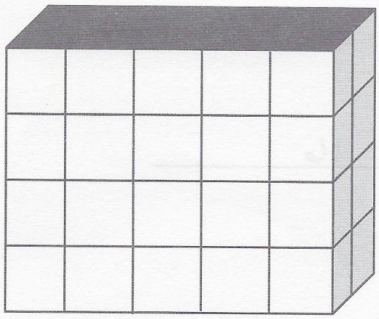
Prediction: 4

Actual: 8

b. 

Prediction: 8

Actual: 16

c. 

Prediction: 20

Actual: 40

3. Cut out the net in the template, and fold it into a cube. Predict the number of 1-centimeter cubes that would be required to fill it. Test your prediction using as few cubes as possible. What did you discover?

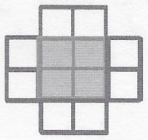
Prediction: _____

What I discovered:

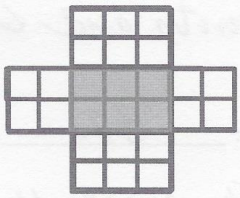
Name _____ Date _____

1. Make the following boxes on centimeter grid paper. Cut and fold each to make 3 open boxes, taping them so they hold their shapes. How many cubes would fill each box? Explain how you found the number.

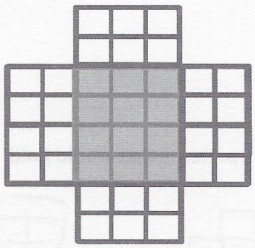
a. Number of cubes: 4



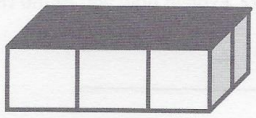
b. Number of cubes: 12



c. Number of cubes: 24

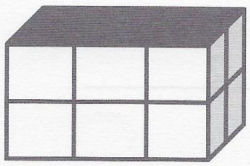


2. How many centimeter cubes would fit inside each box? Explain your answer using words and diagrams on the box. (The figures are not drawn to scale.)

a. 

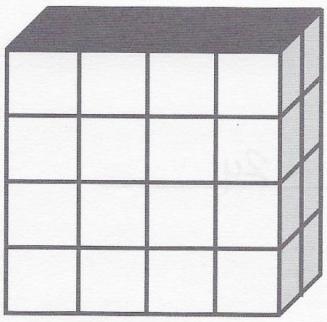
Number of cubes: 6

Explanation: There are 3 cubes in the front, and 3 in the back

b. 

Number of cubes: 12

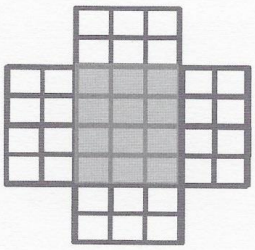
Explanation: There are 6 cubes in the front, and 6 in the back

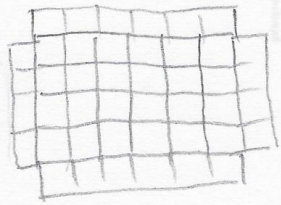
c. 

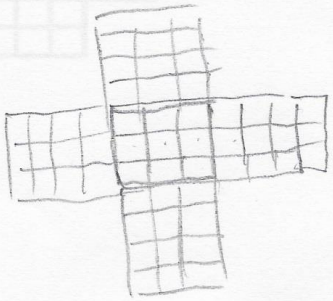
Number of cubes: 32

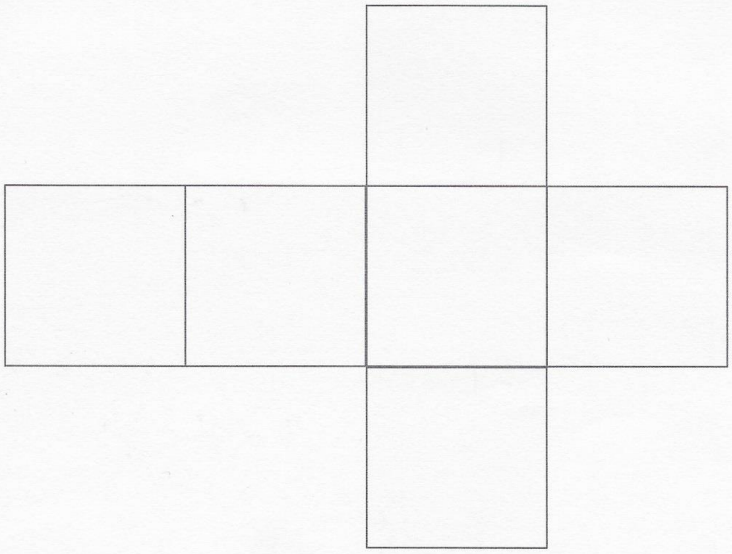
Explanation: There are 16 cubes in the front, and 16 in the back

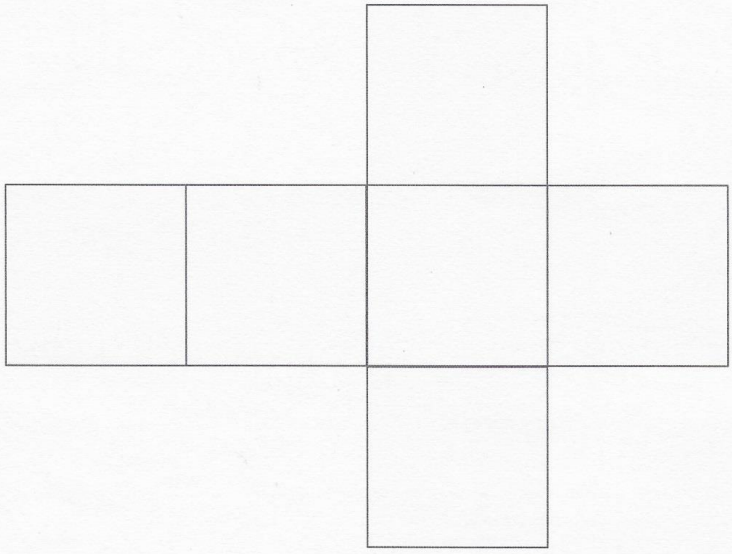
3. The box pattern below holds 24 1-centimeter cubes. Draw two different box patterns that would hold the same number of cubes.



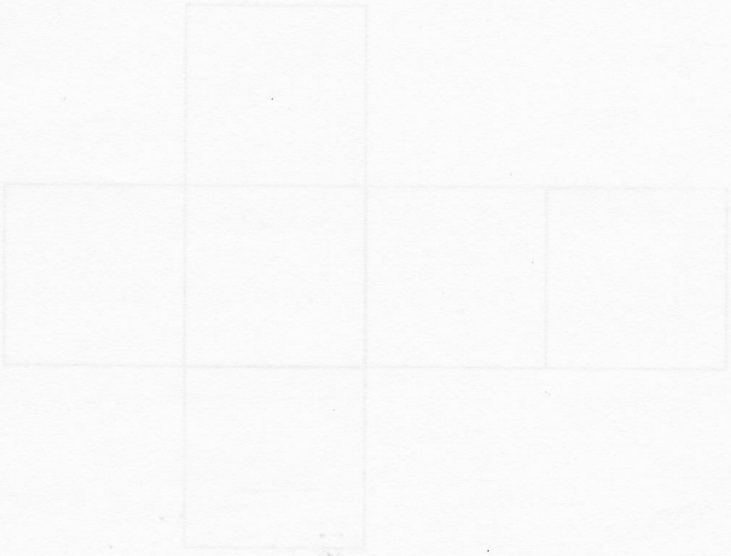








net

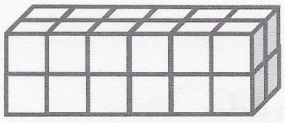


Name _____ Date _____

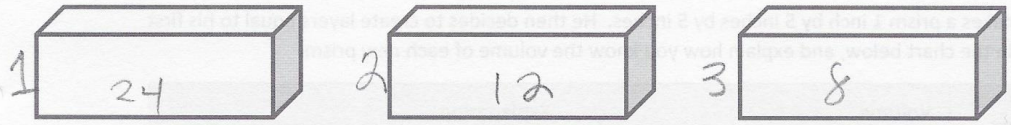
1. Use the prisms to find the volume.

   - Build the rectangular prism pictured below to the left with your cubes, if necessary.
   - Decompose it into layers in three different ways, and show your thinking on the blank prisms.
   - Complete the missing information in the table.

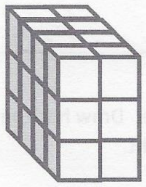
a.



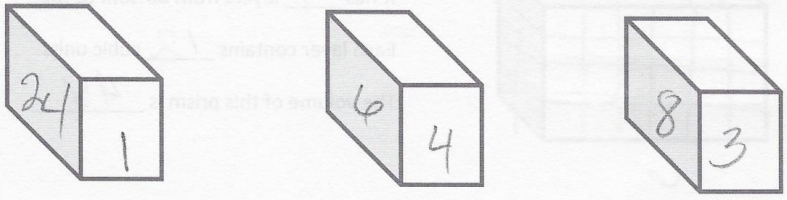
Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
1	24	cubic cm
2	12	cubic cm
3	8	cubic cm



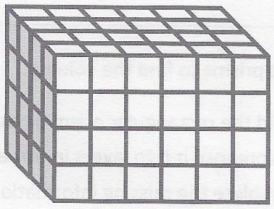
b.



Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
1	24	cubic cm
4	6	cubic cm
3	8	cubic cm



2. Josh and Jonah were finding the volume of the prism to the right. The boys agree that 4 layers can be added together to find the volume. Josh says that he can see on the end of the prism that each layer will have 16 cubes in it. Jonah says that each layer has 24 cubes in it. Who is right? Explain how you know using words, numbers, and/or pictures.

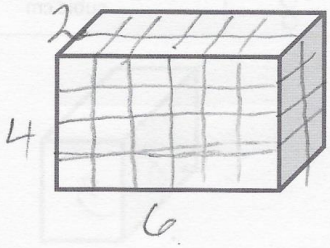


Jonah is right. The base is a rectangle of 6 by 4. So there are 24 cubes in one layer.

3. Marcos makes a prism 1 inch by 5 inches by 5 inches. He then decides to create layers equal to his first one. Fill in the chart below, and explain how you know the volume of each new prism.

Number of Layers	Volume	Explanation
2	50	one layer is 25, 2 are 50 cm^3
4	100	four layers times 25 is 100 cm^3
7	175	seven layers times 25 is 175 cm^3

4. Imagine the rectangular prism below is 6 meters long, 4 meters tall, and 2 meters wide. Draw horizontal lines to show how the prism could be decomposed into layers that are 1 meter in height.



It has 4 layers from bottom to top.

Each layer contains 12 cubic units.

The volume of this prism is 48.

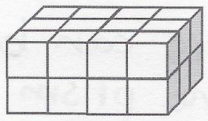
Name _____ Date _____

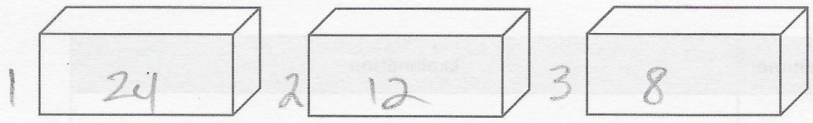
1. Use the prisms to find the volume.

   - The rectangular prisms pictured below were constructed with 1 cm cubes.
   - Decompose each prism into layers in three different ways, and show your thinking on the blank prisms.
   - Complete each table.

a.

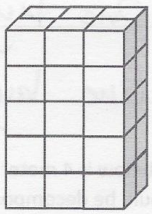
Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
1	24	cubic cm
2	12	cubic cm
3	8	cubic cm

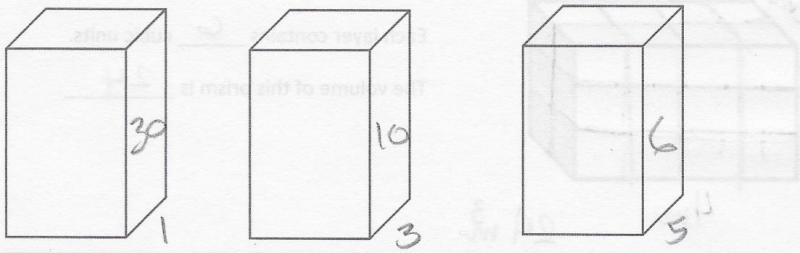




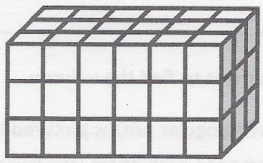
b.

Number of Layers	Number of Cubes in Each Layer	Volume of the Prism
1	30	cubic cm
3	10	cubic cm
5	6	cubic cm





2. Stephen and Chelsea want to increase the volume of this prism by 72 cubic centimeters. Chelsea wants to add eight layers, and Stephen says they only need to add four layers. Their teacher tells them they are both correct. Explain how this is possible.



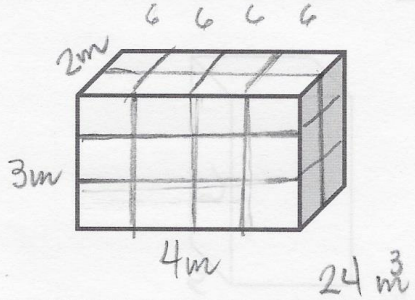
8 layers of 9 are $72 cm^3$
4 layers of 18 are $72 cm^3$ as well.

The layers can be added to the top of the prism or to the side.

3. Juliana makes a prism 4 inches across and 4 inches wide but only 1 inch tall. She then decides to create layers equal to her first one. Fill in the chart below, and explain how you know the volume of each new prism.

Number of Layers	Volume	Explanation
3 ×16	$48 cm^3$	One layer of 16 times 3
5 ×16	$80 cm^3$	One layer of 16 times 5
7 ×16	$112 cm^3$	One layer of 16 times 7

4. Imagine the rectangular prism below is 4 meters long, 3 meters tall, and 2 meters wide. Draw horizontal lines to show how the prism could be decomposed into layers that are 1 meter in height.



$24 m^3$

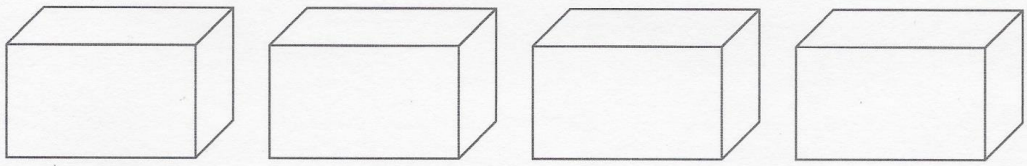
It has 4 layers from left to right.

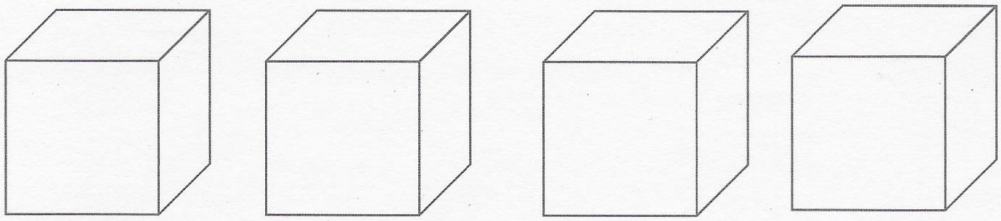
Each layer contains 6 cubic units.

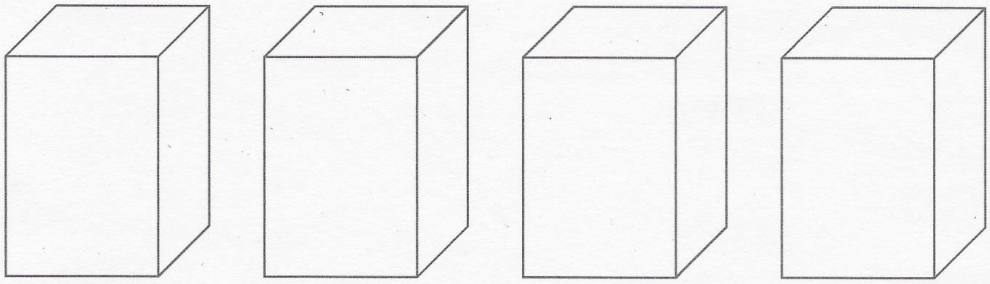
The volume of this prism is 24.

Name _____ Date _____

Use these rectangular prisms to record the layers that you count.







rectangular prism recording sheet