Chapter 6

Geometry & Measurement

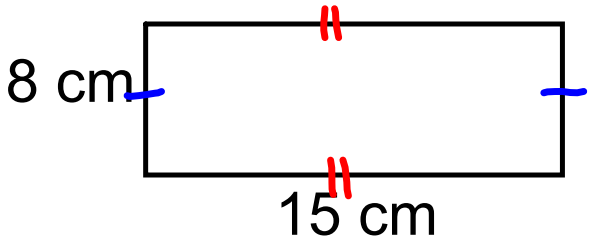
Day 1

Test Review

May 9

1) a) Classify the shape as polygon or non-polygon (Explain why?)

b) Find the perimeter and the area of the following Rectangle



$P = 2(L+w)$

$= 2(15\text{cm} + 8\text{cm})$

$= 2(23\text{cm})$

$= 46\text{cm}$

OR

$P = s + s + s + s$

$= 8\text{cm} + 15\text{cm} + 8\text{cm} + 15\text{cm}$

$= 46\text{cm}$

$A_{Rec} = L \times w$

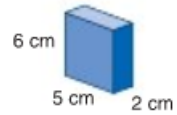
$= 8\text{cm} \times 15\text{cm}$

$= 120\text{cm}^2$

Practice

1. Find the volume of each rectangular prism.

a)

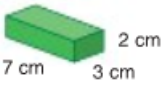


V= L x W x H

= 5cm x 2 cm x 6cm

= 60 cm^3

b)

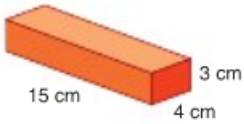


V= L x W x H

= 7cm x 3 cm x 2cm

= 42 cm^3

c)



V= L x W x H

= 15cm x 4 cm x 3cm

= 180 cm^3

2. Estimate, then calculate, the volume of a rectangular prism with these dimensions.

	Length (cm)	Width (cm)	Height (cm)
a)	6	2	2
b)	9	4	7
c)	18	9	12
d)	30	15	6

2a) V= L x W x H

= 6cm x 2 cm x 2cm

= 24 cm^3

2b) V= L x W x H

= 9cm x 4 cm x 7cm

= 252 cm^3

2c) V= L x W x H

= 18cm x 9 cm x 12cm

= 1944 cm^3

2d) V= L x W x H

= 30cm x 15cm x 6cm

= 2700 cm^3

3. A dog box is built to fit in the back of a pick-up truck. It is used to transport sled dogs and supplies to a race. A dog box that holds 3 dogs is 117 cm long, 97 cm wide, and 61 cm tall. Each dog compartment is 38 cm long, 97 cm wide, and 46 cm tall.
   a) What is the volume of each dog compartment?
   b) What is the volume of the dog box that is not used to hold dogs? How did you find out?

a) Compartment

V = L x W x H

= 38cm X 97 cm X 46 cm

= 169 556 cm^3

x 3

= 508 668 cm^3

b) Total box volume

V = L x W x H

= 117cm X 97 cm X 61 cm

= 692 289 cm^3

692 289 cm^3 - 508 668 cm^3

= 183 621 cm^3

118 621 cm^3 is the volume of the box that does not hold dogs

4. During the buffalo hunt, the Métis used a Red River cart to carry buffalo meat and fur. The cart was made of wood and was usually pulled by oxen. The top of this cart has the shape of a rectangular prism with volume 1 350 000 cm^3. The area of its base is about 13 500 cm^2. About how high is the top of the cart? Which strategy did you use to find out?

$V = 1\,350\,000 cm^3$

$A_{base} = 13500 cm^2$

$H = ?$

$H = V \div A_{base}$

V= L x W x H

= Area of base x Height

1 350 000 cm^2 = 13 500 cm^2 x H

100 cm

OR

H = Volume ÷ area of base

1 350 000 cm^2 ÷ 13 500 cm^2 = 100 cm

The top of the cart is 100 cm high

5. A rectangular prism has volume 90 cm^3. The prism has length 9 cm and width 5 cm. What is its height? How do you know?

$V = 90 cm^3$

$L = 9 cm$

$W = 5 cm$

$H = ?$

$A_{base} = L \times W = 9 cm \times 5 cm = 45 cm^2$

V= L x W x H

= 9cm x 5 cm x __cm

90cm^3 = 45 cm^2 x ___ cm

2

the height is 2 cm

$H = V \div A_{base}$

$= 90 cm^3 \div 45 cm^2$

$H = 2 cm$

6. A rectangular prism has volume 192 cm^3.
   a) The prism is 16 cm high. What is the area of its base? How do you know?
   b) What other possible measurements of height and base area could the rectangular prism have? What strategy did you use to find out?

$V = 192 cm^3$

$H = 16 cm$

$A_{base} = ?$

V= L x W x H

= Area of base x Height

192 cm^3 = ____ cm^2 x 16 cm

12

The area of the base is 12 cm^2

OR

area of base= Volume ÷ height

192 cm^3 ÷ 16 cm

= 12 cm^2

b) For example: To have volume of 196 cm^3

Height 2 cm, base area 96 cm^2,

Height 3 cm with base area 64 cm^2,

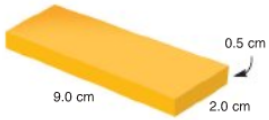
Height 4 cm with base area 48 cm^2,

Height 6 cm with base area 32 cm^2,

Height 8 cm with base area 24 cm^2,

7. Canada's Food Guide recommends that we eat 2 to 4 servings of dairy products every day.
   a) This piece of cheese is 1 serving of dairy products. What is its volume?

V= L x W x H
= 3.0 cm x 2.5 cm x 2.0 cm
= 15 cm^3



V= L x W x H
= 9.0 cm x 2.0cm x 0.5 cm
= 9 cm^3

   b) Is the block of cheese at the right more or less than 1 serving? How do you know?

b) Since 9 cm^3 is smaller than 15cm^3, the block of cheese is less than 1 serving.

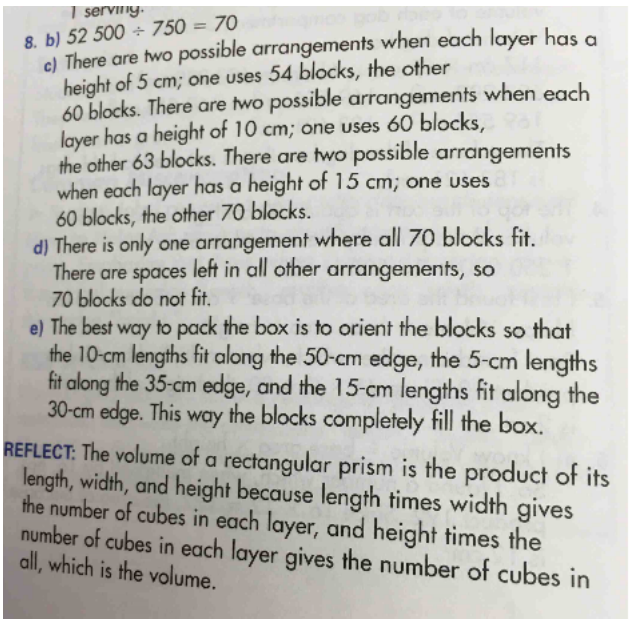
8. Each block in a child's set of building blocks is 15 cm long, 10 cm wide, and 5 cm high. Suppose you put the blocks in a box that is 50 cm long, 35 cm wide, and 30 cm high.

   a) What is the volume of each block? Of the box?
   b) Suppose you only consider the volume. How many blocks would you expect to fit in the box?
   c) Suppose you arrange the blocks neatly in layers. How many different ways can you layer the blocks? How many blocks fit in the box each way?
   d) Compare your answers to parts b and c. Explain any differences.
   e) Which is the best way to pack the blocks? Why?

Block
V= L x W x H
= 15 cm x 10 cm x 5 cm
= 750cm^3

Box
V= L x W x H
= 50 cm x 35 cm x 30 cm
= 52 500 cm^3

b) 52 500 cm^3 ÷ 750cm^3 = 70 you would expect 70 blocks to fix in the box



1 serving.

8. b) 52 500 ÷ 750 = 70

c) There are two possible arrangements when each layer has a height of 5 cm; one uses 54 blocks, the other 60 blocks. There are two possible arrangements when each layer has a height of 10 cm; one uses 60 blocks, the other 63 blocks. There are two possible arrangements when each layer has a height of 15 cm; one uses 60 blocks, the other 70 blocks.

d) There is only one arrangement where all 70 blocks fit. There are spaces left in all other arrangements, so 70 blocks do not fit.

e) The best way to pack the box is to orient the blocks so that the 10-cm lengths fit along the 50-cm edge, the 5-cm lengths fit along the 35-cm edge, and the 15-cm lengths fit along the 30-cm edge. This way the blocks completely fill the box.

REFLECT: The volume of a rectangular prism is the product of its length, width, and height because length times width gives the number of cubes in each layer, and height times the number of cubes in each layer gives the number of cubes in all, which is the volume.

Class/Homework

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#1, 3, #5, #6, #7, #8 (don't estimate just do)

Test Outline

1) Sort Polygons (Provided pictures) as /3pts /3pts
   - Regular and irregular
   - convex or concave

2) Provide polygons determine which are congruent (Remember you Need to either measure side and angles OR Trace) /4pts

3) Find Perimeter of 3 Shapes (Provide formulas and units). /6pts

4) Find Area of rectangle /2pts

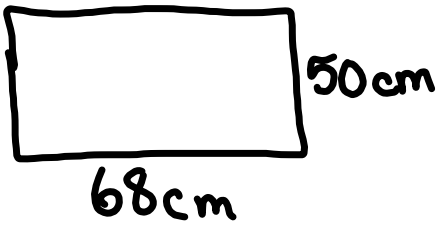
5) Complete Area chart /4pt

Ex)

L cm	W cm	A cm^2
5	6	
?	7	63

6) Find the Volume of 2 Rectangular Prism /4pts

$V = L \times w \times H$



a)

$A = L \times W$

$= 68cm \times 50cm$

$= 3400cm^2$

b) $A_{Flag} = 2500cm^2$

$2500cm^2$

$L \times W = 2500cm^2$

won't fit ← $25cm \times 100cm$ b/c 100cm too big

$250cm \times 10cm$ b/c 250cm too big

$50cm \times 50cm$

WORK