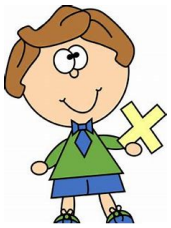


Chapter 6

Geometry & Measurement

Lesson 9

Day 1

- 1) a) If a table has a width of 90 cm and a length of 120 cm, then what is the area of the rectangular table?

W = 90 cm
L = 120 cm
A = ?

$A = L \times W$
$= 120\text{cm} \times 90\text{cm}$
$= 10800\ \text{cm}^2$

b) If a rectangle has an area of 54.6 cm^2 and a width of 6 cm, what is the length of the rectangle? (Show work)

$A = 54.6\ \text{cm}^2$
$W = 6\ \text{cm}$
$L = ?$

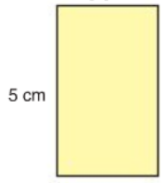
$L = A \div W$
$= 54.6\text{cm}^2 \div 6\text{cm}$
$L = 9.1\text{cm}$

$A = L \times W$
$54.6\text{cm}^2 = ? \times 6\text{cm}$
$? = 9.1\text{cm}$

Practice

1. Find the area of each rectangle.

a)



A = L x W

= 3 cm x 5 cm

= 15 cm^2

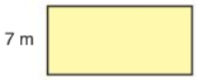
b)

A = L x W

= 18 mm x 10 mm

= 180 mm^2

c)



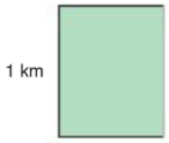
A = L x W

= 15 m x 7 m

= 105 m^2

2. Which rectangle below do you think has the greatest area?
Estimate first. Use a formula to check.
Order the areas from least to greatest.
How does the order compare with your prediction?

a)



A = L x W

= 1 km x 0.8 km

= 0.8 km^2

middle

b)

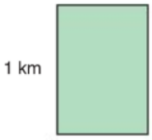
A = L x W

= 0.5 km x 2 km

= 1 km^2

greatest

c)



A = L x W

= 1 km x 0.7 km

= 0.7 km^2

least

3. Copy and complete this chart.

Rectangle	Length (cm)	Width (cm)	Area (cm^2)
A	7	5	?
B	?	6	12.6
C	3	?	13.5
D	5.3	7	?

Which strategy did you use to find the missing number each time?

A) A = L x W

= 7 cm x 5 cm

= 35 cm^2

B) A = L x W

12.6 cm^2 = ? cm x 6 cm

length = Area ÷ base

Length = 12.6cm^2 ÷ 6 cm

= 2.1 cm

C) A = L x W

13.5 cm^2 =3 cm x ? cm

Base = Area ÷ Length

Base = 13.5cm^2 ÷ 3 cm

= 4.5 cm

D) A = L x W

= 5.3 cm x 7cm

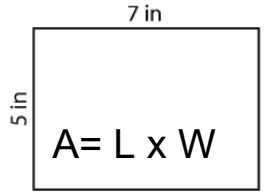
= 37.1 cm^2

Worksheet

Area of a Rectangle

Find the area of each rectangle.

1)

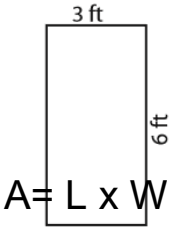


A= L x W

= 5 in x 7 in

= 35 in^2

2)

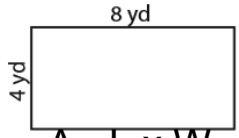


A= L x W

= 6 ft x 3 ft

= 18 ft^2

3)

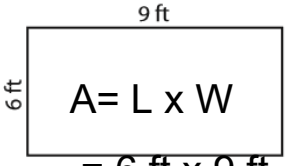


A= L x W

= 4 yd x 8 yd

= 32 yd^2

4)

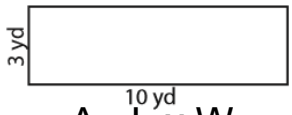


A= L x W

= 6 ft x 9 ft

= 54 ft^2

5)

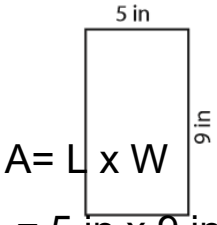


A= L x W

= 3 yd x 10 yd

= 30 yd^2

6)



A= L x W

= 5 in x 9 in

= 45 in^2

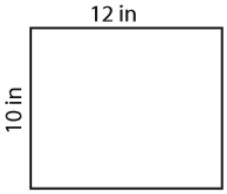
7)

A= L x W

= 5 yd x 4 yd

Area = = 20 yd^2

8)

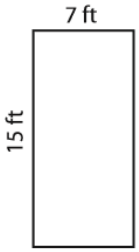


A= L x W

Area = = 10 in x 12 in

= 120 in^2

9)

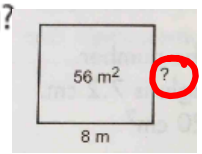


A= L x W

Area = = 15 ft x 7 ft

= 105 ft^2

4. Matt's dog has a rectangular dog run.
The length of the dog run is 8 m. The total area enclosed is 56 m^2.
How wide is the dog run? Draw a diagram.
How can you use a number sentence to show your thinking?



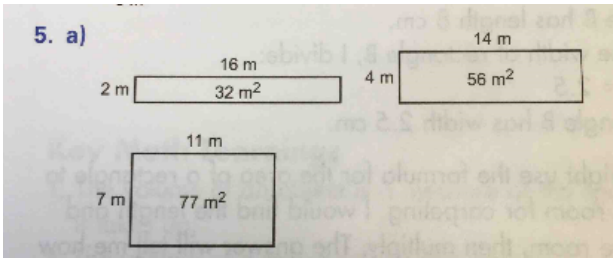
Area = L x W

56 m^2 = 8 x W

OR W = A ÷ L
= 56cm² ÷ 8cm
= 7cm

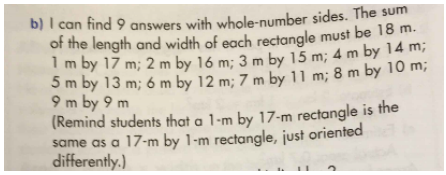
we know 8 x 7 = 56, so the dog run has width of 7m

5. Lena used 36 m of fencing to enclose a rectangular vegetable garden on her farm in Battleford, Saskatchewan.
   a) Sketch some possible rectangles and label their side lengths. What is the area of the enclosed section in each case?
   b) How many different answers can you find?



b) per = 36
= 2(L+W)
= 2(18)

so sum of L and W must be 18

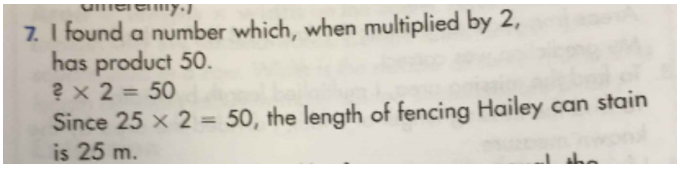

b) I can find 9 answers with whole-number sides. The sum of the length and width of each rectangle must be 18 m. 1 m by 17 m; 2 m by 16 m; 3 m by 15 m; 4 m by 14 m; 5 m by 13 m; 6 m by 12 m; 7 m by 11 m; 8 m by 10 m; 9 m by 9 m
(Remind students that a 1-m by 17-m rectangle is the same as a 17-m by 1-m rectangle, just oriented differently.)

6. A banner for the Vancouver 2010 Olympics has length 226 cm and width 72 cm. What is the area of the banner?

A = L x W
= 226 cm x 72 cm
= 16 272 cm^2

Area of the banner is 16 272 cm^2

7. Hailey bought a can of stain. The stain will cover 50 m^2 of fencing. The fence has height 2 m.
What length of fencing can Hailey stain before she runs out of stain? How did you find out?


7. I found a number which, when multiplied by 2, has product 50.
? × 2 = 50
Since 25 × 2 = 50, the length of fencing Hailey can stain is 25 m.

9)

W = 4cm

$A = 28.8cm^2$

L = ?

$A = L \times W$

$28.8_{cm^2} = ? \times 4cm$

↓

7.2cm

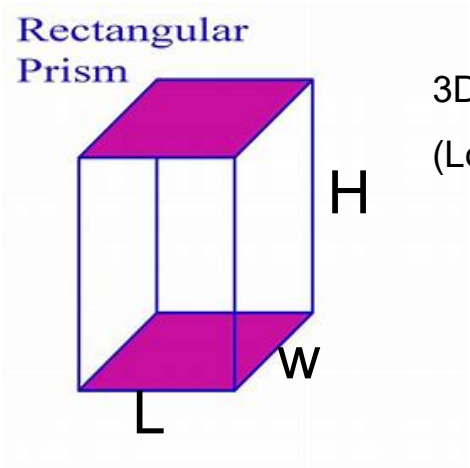
$L = A \div W$

$= 28.8cm^2 \div 4cm$

$L = 7.2cm$

The length of the banner is 7.2cm

Rectangular Prism



3D shape

(Looks like a box)

6 sides

Top = Bottom

Left side = Right side

Front = Back

Connect

A rectangular prism is 10 cm long, 5 cm wide, and 6 cm high.

The length is 10 cm.
It is 1 row of 10 cubes.
Volume of 1 row = 10 cm^3

The width is 5 cm.
Five rows of 10 cubes
make 1 layer of 50 cubes.
Volume of 1 layer = 5 × 10 cm^3
= 50 cm^3

The height is 6 cm.
Six layers of 50 cubes make
a volume of 300 cubes.
Volume of 6 layers = 6 × 50 cm^3
= 300 cm^3

(5 × 10) × 6
50 × 6
300

We can use the descriptions above to develop a formula for the volume of a rectangular prism.

Volume of Rectangular Prism

Volume is the amount of space inside a 3D object

(How much to fill up a box)

- it is measured in cubic units

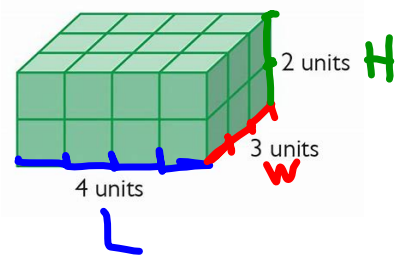
example) mm^3, cm^3, m^3, km^3

Study

Volume of rectangular Prism = L x W X H

Demonstrate with paper stack

Ex) Find the volume



$V = L \times w \times H$ (area of base)

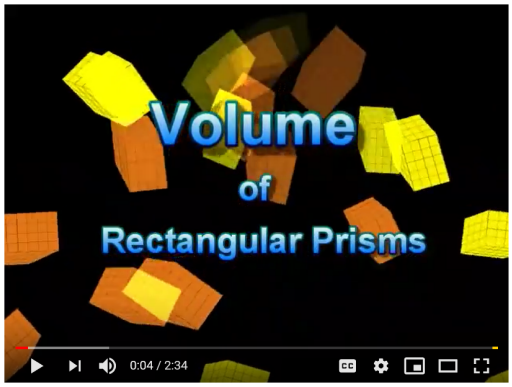
$= 4\text{units} \times 3\text{units} \times 2\text{units}$

$= 12\ \text{units}^2 \times 2\text{units}$

$= 24\ \text{units}^3$

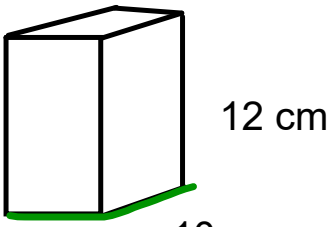
$V = L \times w \times H$

$= \text{Area base} \times H$



Volume - Rectangular Prisms

Find the volume of each shape (Show work)



$V = L \times w \times H$

$= 7cm \times 10cm \times 12cm$

$= 70cm^2 \times 12cm$

$= 840cm^3$

L w H

#2) If a shed has dimensions of 8 m by 8 m by 15 m, what is the volume of the shed?

$V = L \times w \times H$

$= 8m \times 8m \times 15m$

$= 64m^2 \times 15m$

$= 960m^3$

Class/Homework

Test May 9

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#1,2,3

no estimates Check V=LxwxH

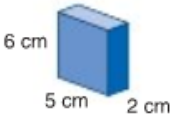
New Calculators
→ cheap one from Dollar Store

Practice

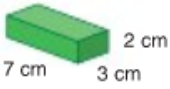
TIP

1. Find the volume of each rectangular prism.

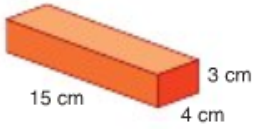
a)



b)



c)



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

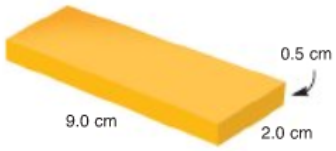
3. A dog box is built to fit in the back of a pick-up truck. It is used to transport sled dogs and supplies to a race. A dog box that holds 3 dogs is 117 cm long, 97 cm wide, and 61 cm tall. Each dog compartment is 38 cm long, 97 cm wide, and 46 cm tall.
   a) What is the volume of each dog compartment?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

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?

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?

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?

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?



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

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?