UNIT 6

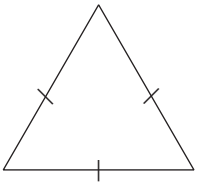
STUDENT BOOK 1 LESSON

Exploring Triangles

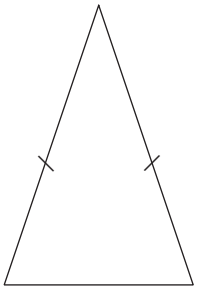
Quick Review

At Home At School

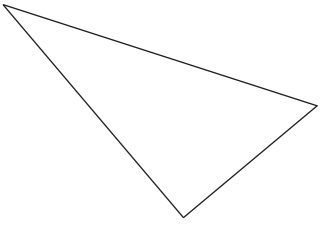
➤ We can name triangles by the number of equal sides.



An **equilateral triangle** has 3 equal sides.
It has three 60° angles.
It has 3 lines of symmetry.



An **isosceles triangle** has 2 equal sides.
It has 2 equal angles.
It has 1 line of symmetry.



A **scalene triangle** has no equal sides, no equal angles, and no lines of symmetry.

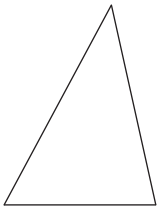
Try These

1. Name each triangle as equilateral, isosceles, or scalene.

a)

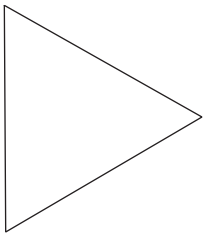
_____

b)



_____

c)



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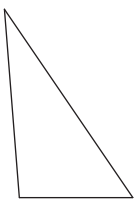
d)



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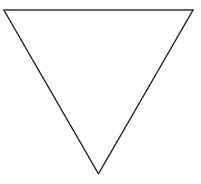
e)



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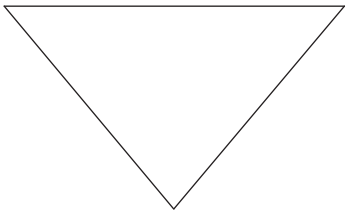
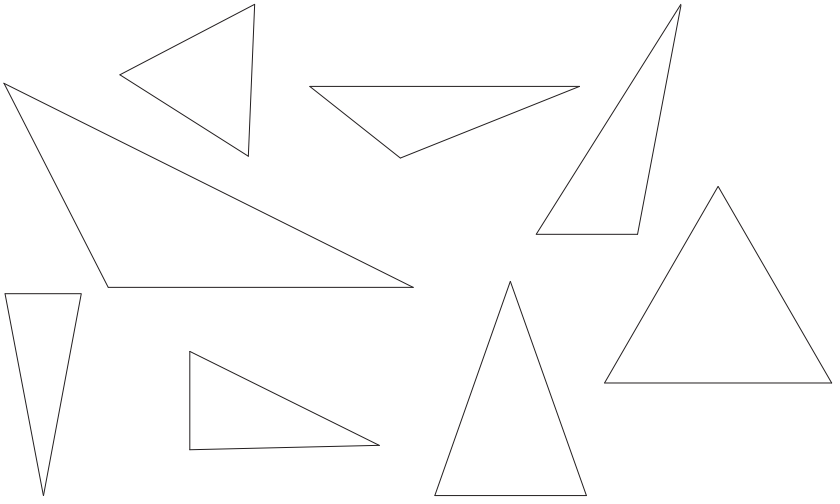
f)



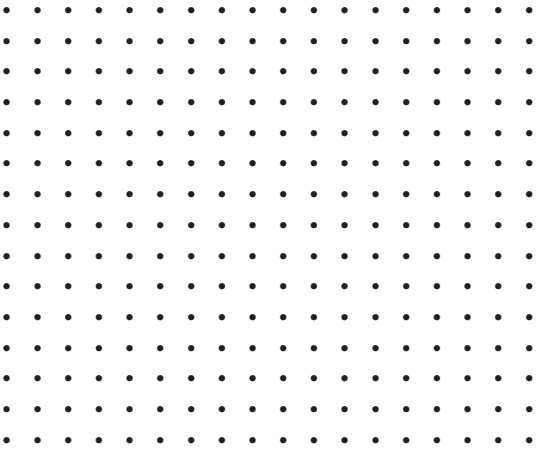
_____

Practice

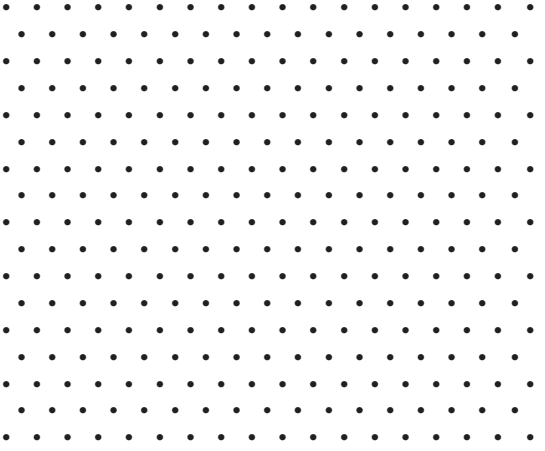
1. Write an S inside the triangles that are scalene.
Write an I inside the triangles that are isosceles.
Write an E inside the triangles that are equilateral.



2. **a)** Draw 3 different isosceles triangles.



b) Draw 3 different equilateral triangles.



Stretch Your Thinking

Explain why it is not possible to make an equilateral triangle on a geoboard.

UNIT 6

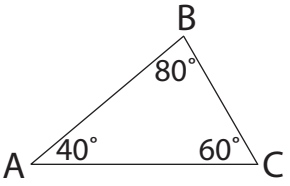
STUDENT BOOK 2 LESSON

Naming and Sorting Triangles by Angles

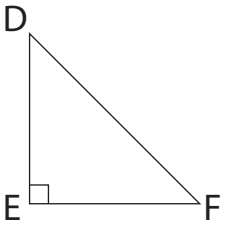
Quick Review

At Home At School

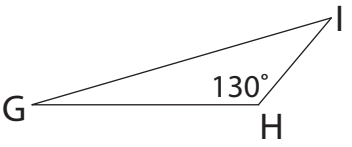
An **acute triangle** has all angles less than 90°.



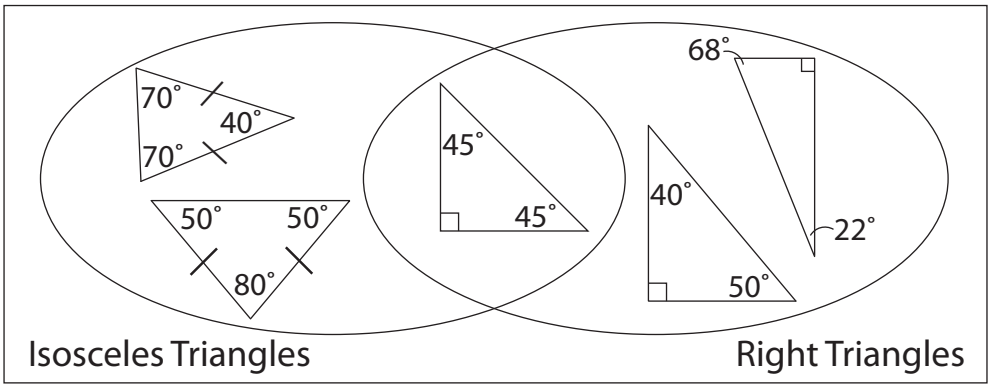
A **right triangle** has one 90° angle.



An **obtuse triangle** has one angle greater than 90°.



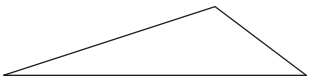
We can sort triangles in a Venn diagram.



Try These

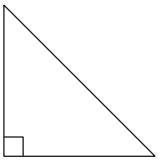
1. Name each triangle as an acute, a right, or an obtuse triangle.

a)



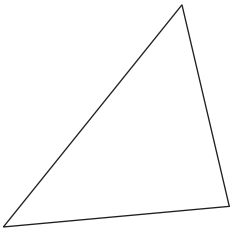
_____

b)



_____

c)



_____

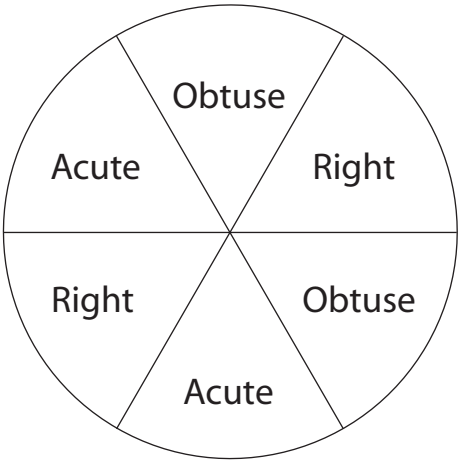
2. Which triangle in question 1 is isosceles? How do you know?

_____

Practice

1. Play this game with a partner.
You will need pencils and an open paper clip to use as a pointer.

- ➤ Player A spins the pointer and draws whichever triangle the pointer lands on.
- ➤ Player B takes a turn. Player B's triangle can touch, but not overlap.
- ➤ Continue taking turns. If you are unable to draw a triangle, you lose your turn.
- ➤ The last person to successfully draw a triangle is the winner.



Stretch Your Thinking

Can you draw each triangle?

a) A triangle with an obtuse angle and 2 equal sides. _____

b) A triangle with a right angle and no equal sides. _____

c) A triangle with 3 acute angles and 2 of the angles are equal. _____

d) A triangle with 3 right angles. _____

e) A triangle with 3 equal sides and 1 obtuse angle. _____

UNIT 6

STUDENT BOOK 3 LESSON

Drawing Triangles

Quick Review

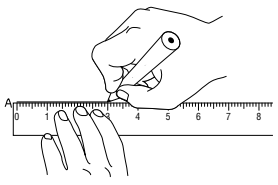
At Home At School

You can use a ruler and a protractor to construct a triangle.
Construct triangle ABC with these measures:

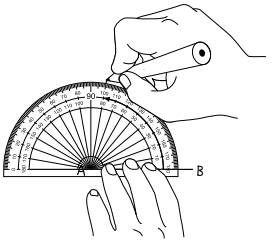
- AB = 3 cm
- ∠A = 80°
- AC = 2.5 cm

Sketch the triangle first.
Label each side and angle.

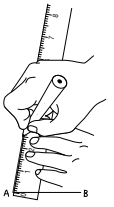
Draw side AB. Make it 3 cm long.



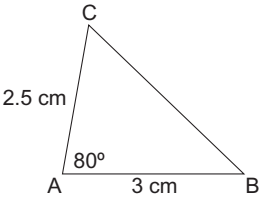
Measure an 80° angle at A.



Draw side AC. Make it 2.5 cm long.



Join C to B to make side BC.



Try These

1. Use a ruler and protractor.
Construct triangle EFG.
Side EF is 7 cm long.
Angle F is 90°.
Side FG is 5.3 cm long.

2. What is the measure of:

a) angle E? _____ **b)** angle G? _____

3. How long is side EG? _____

Practice

1. Construct each triangle using a ruler and a protractor.
Label each triangle with the measures of all the sides and angles.

a) Triangle JKL
- JL = 4 cm
- $\angle L = 60°$
- JK = 4 cm

b) Triangle XYZ
- XY = 5.8 cm
- $\angle X = 90°$
- $\angle Y = 25°$

c) Triangle TUV
- UV = 6.2 cm
- $\angle T = 70°$
- $\angle U = 45°$

d) Triangle PQR
- $\angle P = 70°$
- PQ = 3.5 cm
- $\angle Q = 70°$

Stretch Your Thinking

Suppose you double the side lengths of a regular triangle.
What happens to the measure of the angles? Explain.

UNIT 6

STUDENT BOOK 4 LESSON

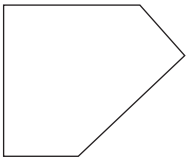
Investigating Polygons

Quick Review

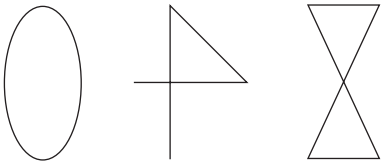
At Home At School

- A polygon is a closed shape with sides that are straight line segments. Exactly 2 sides meet at each vertex. The sides intersect only at the vertices.

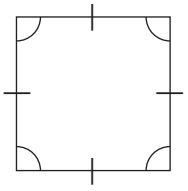
This shape is a polygon.



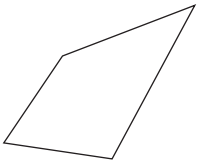
These shapes are **non-polygons**.



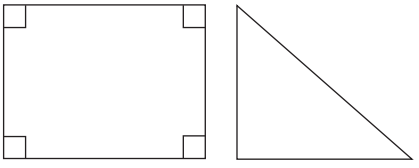
- A **regular polygon** has all sides and all angles equal.
It also has line symmetry.



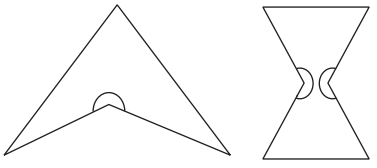
An **irregular polygon** does not have all sides equal and all angles equal.



- A **convex polygon** has all angles less than 180°.

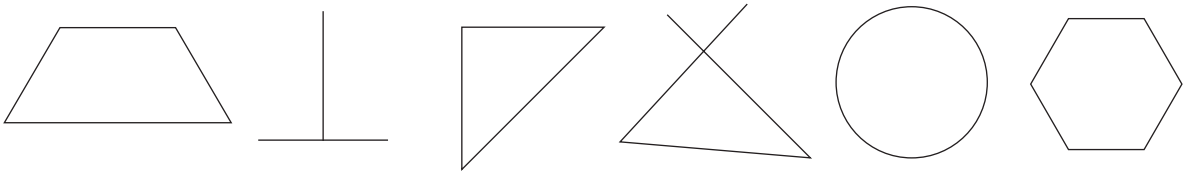


A **concave polygon** has at least one angle greater than 180°.



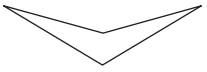
Try These

1. Circle each polygon.

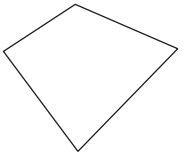


Practice

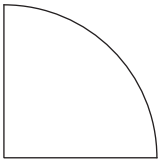
1. Match each shape to its description.

a) 

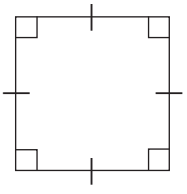
regular polygon

b) 

non-polygon

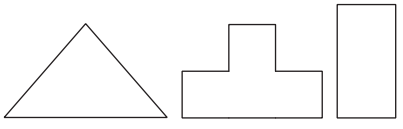
c) 

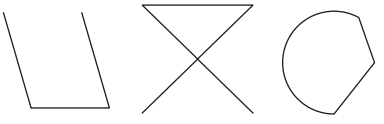
concave quadrilateral

d) 

convex quadrilateral

2. Draw a different shape that belongs in each set.

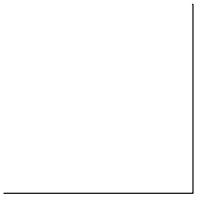
a) 

b) 

Stretch Your Thinking

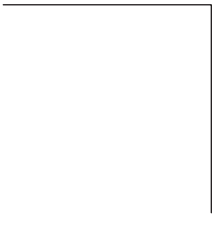
Complete each polygon.

a) a convex polygon



b) a concave polygon

c) a regular polygon



UNIT 6

STUDENT BOOK 5 LESSON

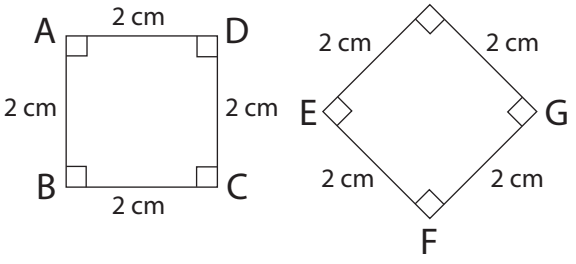
Congruence in Regular Polygons

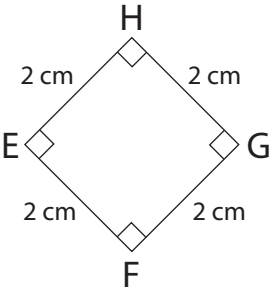
Quick Review

At Home At School

Here are 2 ways to show 2 squares are **congruent**.

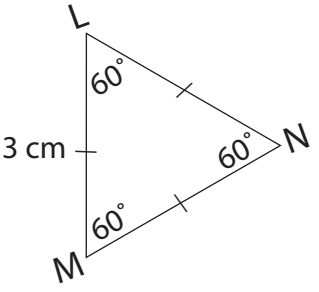
- Place one square on top of the other.
  If they match exactly, they are congruent.
- Compare the side and angle measures.
  If all sides are equal and all angles are equal, the squares are congruent.

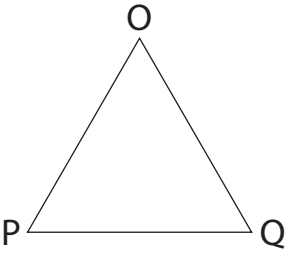




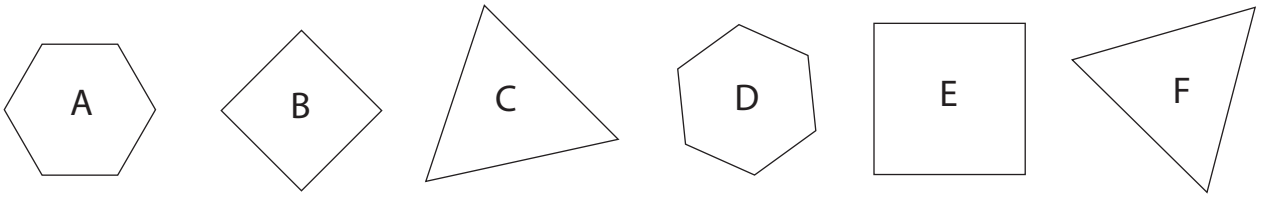
Try These

1. Triangles LMN and OPQ are congruent.
Write the measure of each angle and the length of each side in OPQ.



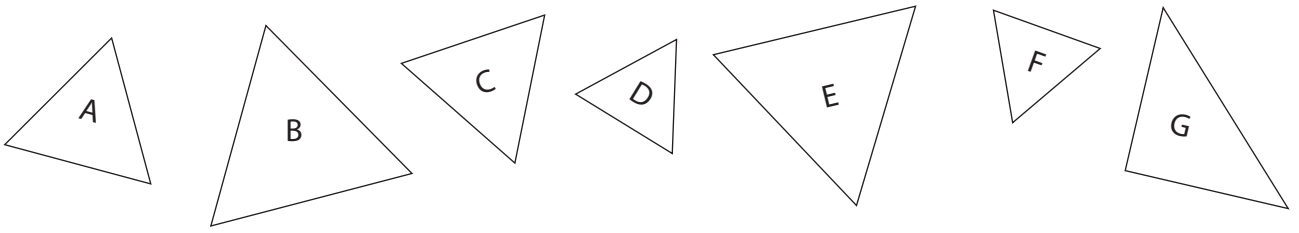


2. Which of these polygons are congruent? Explain how you know.

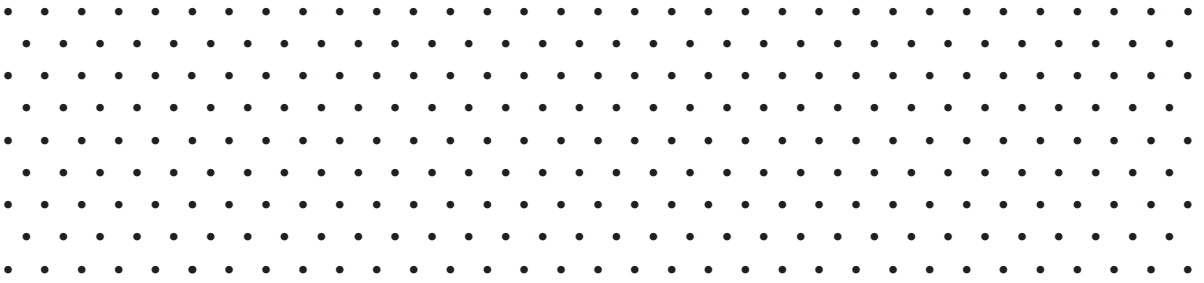


Practice

1. Find pairs of congruent triangles. Join each pair with a line.

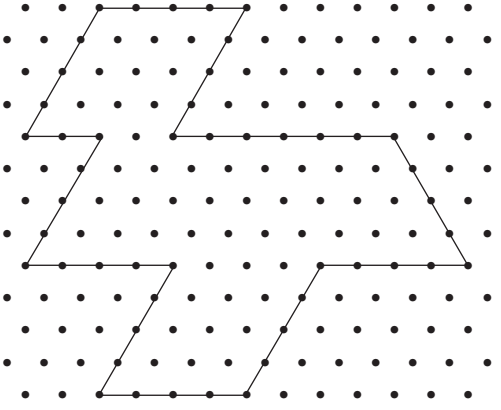


2. Draw 3 congruent regular triangles.
Label the angle measures and side lengths of each.



Stretch Your Thinking

Draw lines to divide this shape into 9 congruent triangles.



UNIT 6

STUDENT BOOK 7 LESSON

Perimeters of Polygons

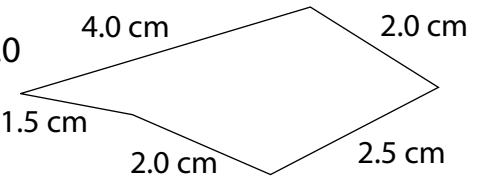
Quick Review

At Home At School

➤ We can find the perimeter of any polygon by adding the side lengths.
For this pentagon:

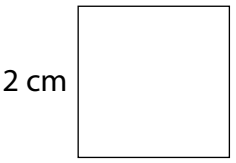
Perimeter $= 4.0 + 1.5 + 2.0 + 2.5 + 2.0$
$= 12$

The perimeter is 12 cm.



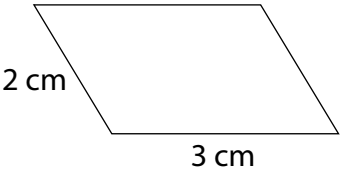
➤ We can use a formula to find the perimeter of some polygons.

Square



$P = s \times 4$
$P = 2 \times 4$
$= 8$

Parallelogram



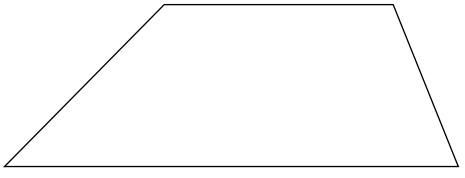
$P = 2 \times (\ell + s)$
$P = 2 \times (3 + 2)$
$= 2 \times 5$
$= 10$

The perimeters of the polygons are 8 cm and 10 cm.

Try These

1. Find the perimeter of each polygon.

a)



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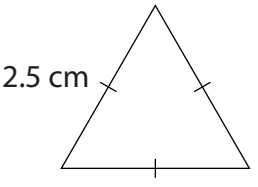
b)



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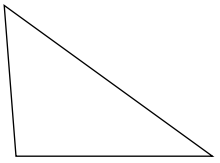
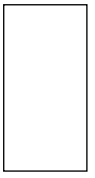
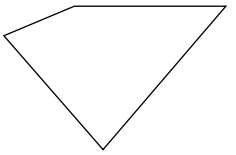
_____

Practice

1. Find the perimeter of each polygon.

a) 

b) 

c) 

_____ _____ _____

_____ _____ _____

2. Kerry skates laps around the playground.
The playground is 150 m long and 50 m wide.
How many laps will it take Kerry to skate 1 km? _____

_____

3. The perimeter of an equilateral triangle is 5.1 m. How long are its sides?
Give your answer in as many different units as you can.

_____

_____

4. The perimeter of an atlas is 1.4 m.
How long might each side be? _____

_____

5. Suppose the side lengths of a rectangle are halved.
What would happen to the perimeter?

_____

Stretch Your Thinking

One side of Kirby's rectangular
garden measures 5 m.
The perimeter of the garden is 27 m.
Draw a sketch of Kirby's garden.
Label the side lengths.

UNIT 6

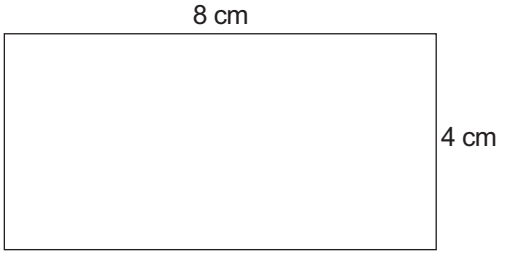
STUDENT BOOK 8 LESSON

Area of a Rectangle

Quick Review

At Home At School

Here is one way to find the area of a rectangle.



➤ Multiply the length by the width.
$8 \times 4 = 32$
So, the area of the rectangle is 32 cm^2.

Rule: To find the area of a rectangle, multiply the length by the width.

Formula: Area = length × width
$A = \ell \times w$

Try These

Find the area of each rectangle.
Complete the chart.

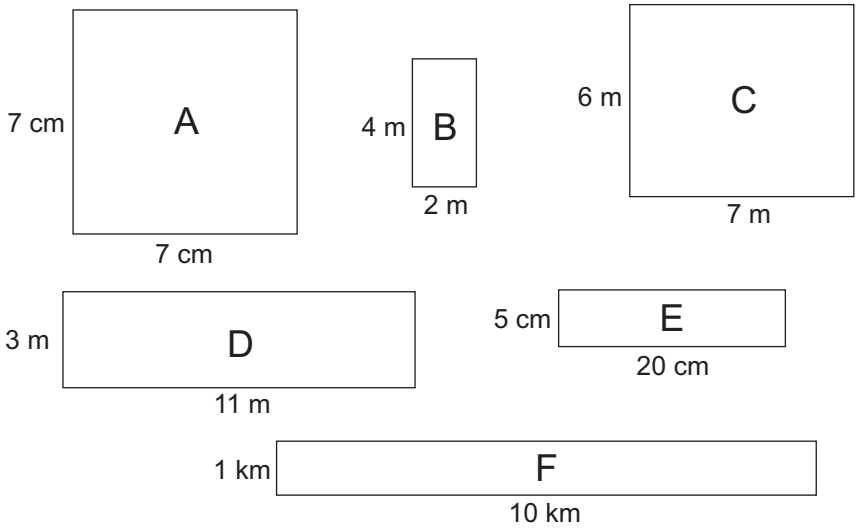
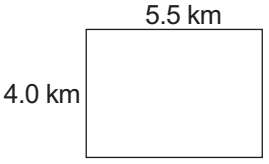


Figure	Area
A	
B	
C	
D	
E	
F	

Practice

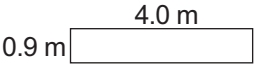
1. Find the area of each rectangle.

a)



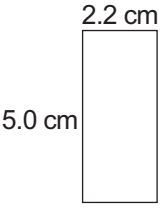
Area = _____

b)



Area = _____

c)



Area = _____

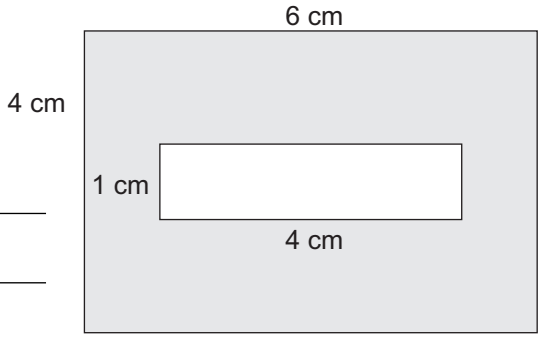
2. Measure the length and width of each object to the nearest unit. Use these dimensions to find the area. Record your work in the chart.

Object	Length	Width	Area
a tabletop			
the classroom floor			
a sheet of paper			
a page from a magazine			

3. Draw a rectangle with an area of 12 cm^2. Label the side lengths.

Stretch Your Thinking

Find the area of the shaded part of the rectangle. Show all your work.



UNIT 6

STUDENT BOOK 9 LESSON

Volume of a Rectangular Prism

Quick Review

At Home At School

You can use a formula to find the volume of a rectangular prism. The volume is the product of the prism's length, width, and height.

Volume = length × width × height

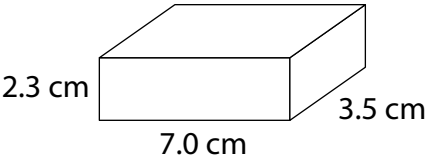
$V = \ell \times w \times h$

This rectangular prism is 7.0 cm long, 3.5 cm wide, and 2.3 cm high.

Volume = 7.0 cm × 3.5 cm × 2.3 cm

= 24.5 cm^2 × 2.3 cm

= 56.35 cm^3

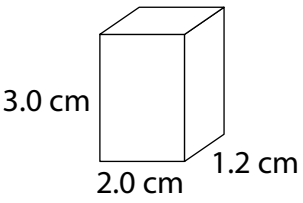


The volume of the prism is 56.35 cm^3.

Try These

1. Find the volume of each rectangular prism.

a)



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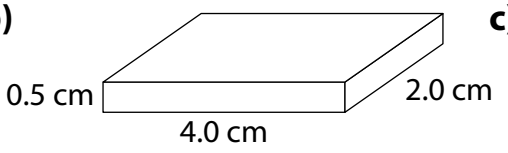
b)



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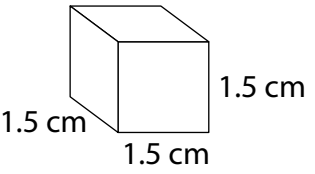
c)



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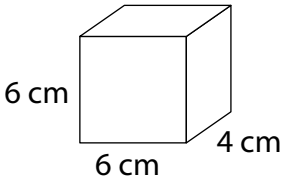
d)



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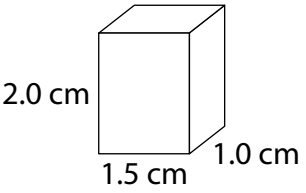
e)



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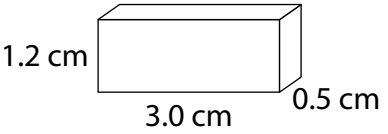
f)

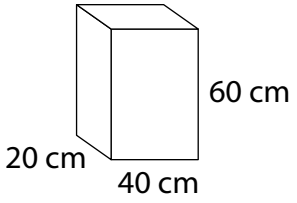


_____

Practice

1. Find the volume of each box.

a)



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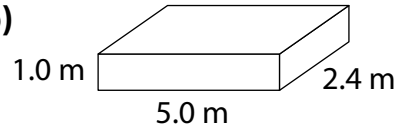
b)



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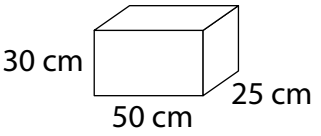
c)



_____

2. Work with a partner.

a) Find 4 small boxes. Label the boxes A, B, C, and D.

b) Measure the dimensions of each box. Estimate, then calculate, each volume. Record your results in the table.

Box	Length	Width	Height	Estimated Volume	Actual Volume
A					
B					
C					
D					

3. Complete each table.

a)

Length (cm)	Width (cm)	Height (cm)	Volume (cm^3)
6	9	3	
8		2	80
4	3		48
	5	5	125

b)

Length (cm)	Width (cm)	Height (cm)	Volume (cm^3)
5.3	4.0	7.1	
6.0	3.2		96
	2.0	1.1	22
12.0		4.0	120

Stretch Your Thinking

Jocelyn built a rectangular prism with 36 centimetre cubes.
What might be the dimensions of the prism? Give as many answers as you can.

_____

_____