UNIT 3

STUDENT BOOK 1 LESSON

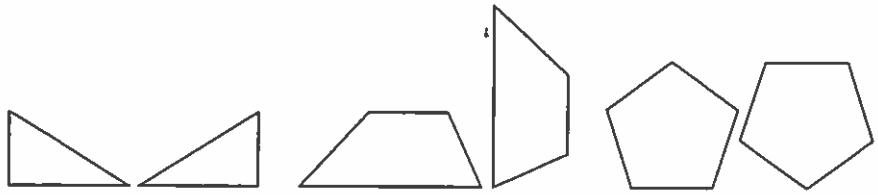
Congruent Figures

Quick Review

At Home At School

Figures that are **congruent** are the same size and shape.

➤ The figures in each pair are congruent.



Sometimes, you have to flip or turn a figure to check if it is congruent to another figure.

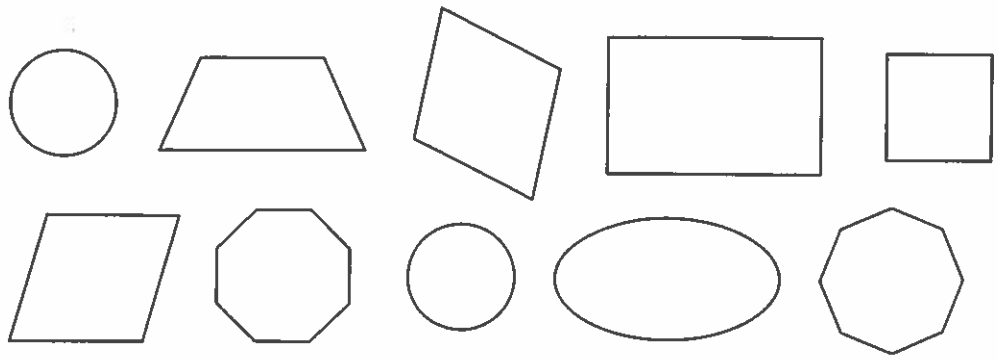
➤ Tracing paper can help you find out if two figures are congruent.

- Trace one of the figures.
- Place the tracing on top of the other figure.

The figures are congruent if they match.

Try These

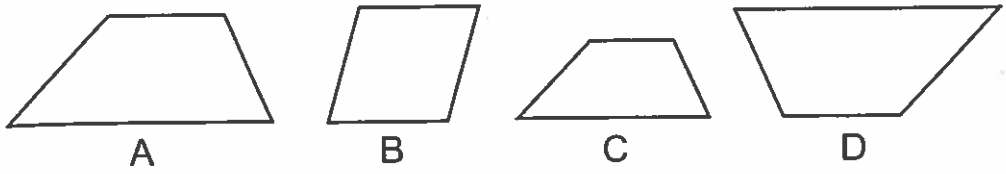
1. a) Find 3 pairs of congruent figures.
Join each pair with a line.
Use tracing paper to check.



b) How do you know the figures are congruent?

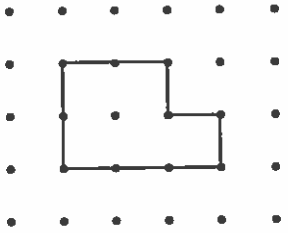
Practice

1. Circle the figure that is congruent to A.

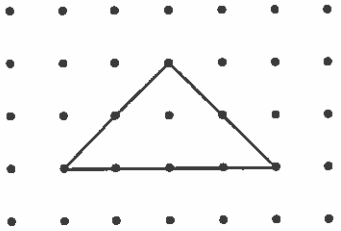


2. Join the dots to divide the figure into

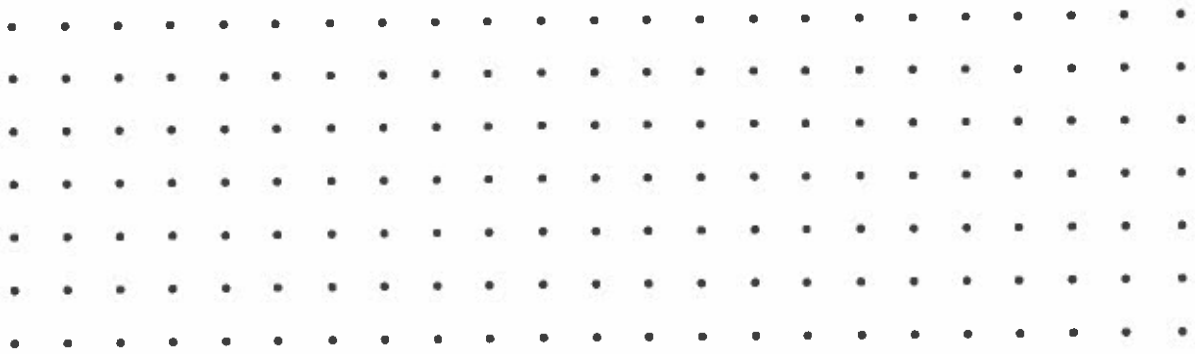
a) 5 congruent squares



b) 2 congruent triangles

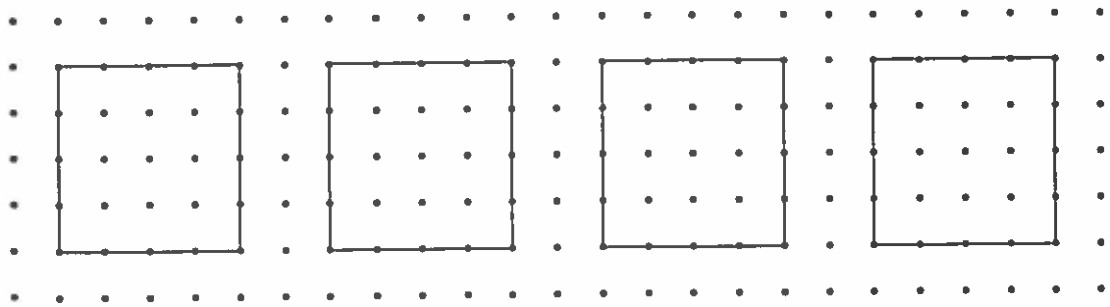


3. Use the dot paper to draw 2 congruent figures.



Stretch Your Thinking

Find a different way to divide each square into 4 congruent parts.



UNIT 3

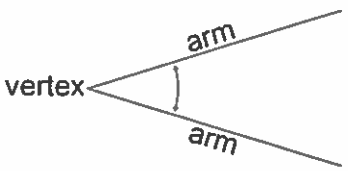
STUDENT BOOK 2 LESSON

Exploring Angles

At Home
At School

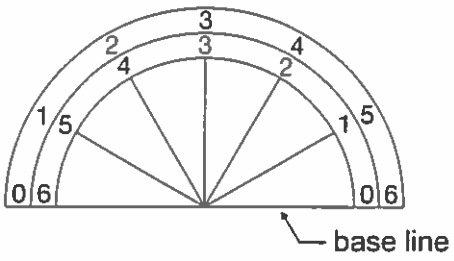
Quick Review

An angle is formed when 2 lines cross.



A **protractor** measures angles.

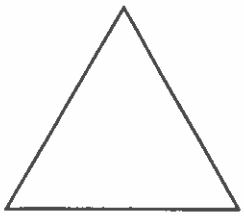
This protractor has units from 0 to 6 clockwise and counterclockwise.



To measure an angle,
count how many units fit the angle.

Try These

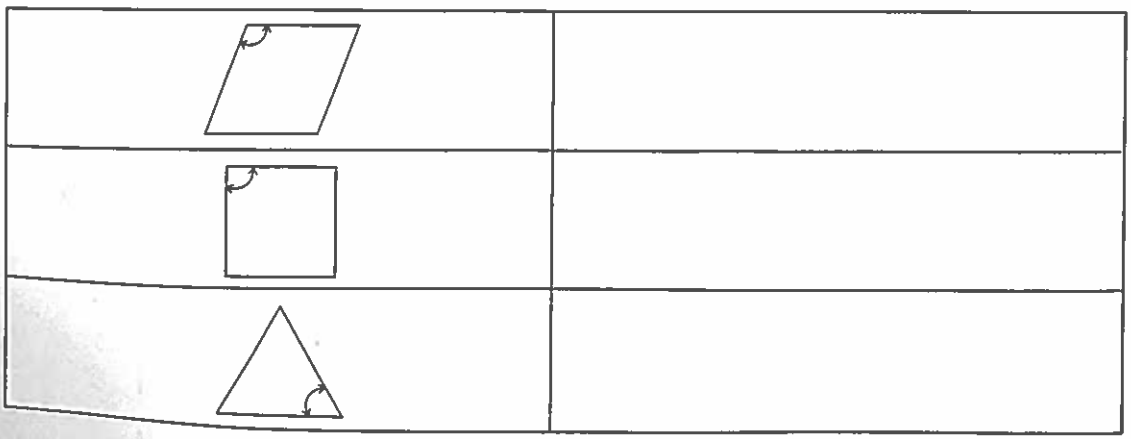
1. Look at this Pattern Block.
What can you tell about the 3 angles?



_____

_____

2. Write whether each angle is *a right angle*, *less than a right angle*, or *greater than a right angle*.

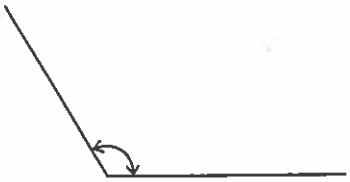


Practice

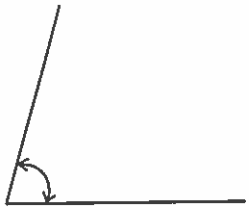
Use the 6-unit protractor your teacher gave you.

1. Measure each angle.

a)

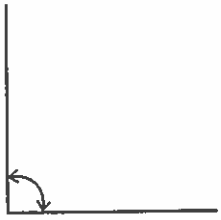


b)



c)

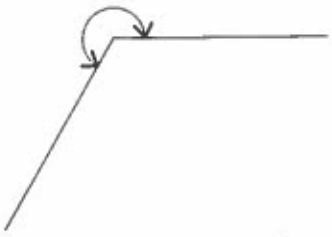
d)



2. Use a ruler. Draw 3 angles. Measure each angle and record your measurements.

Stretch Your Thinking

Explain how you can use your protractor to measure this angle.



UNIT 3

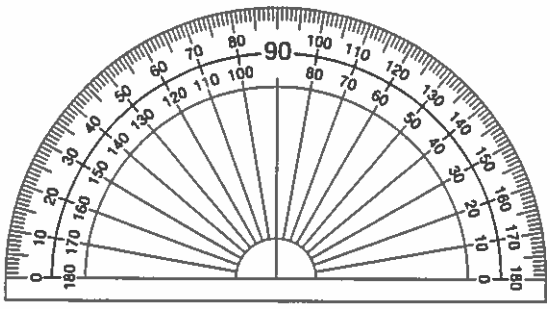
STUDENT BOOK 3 LESSON

Measuring Angles

Quick Review

At Home At School

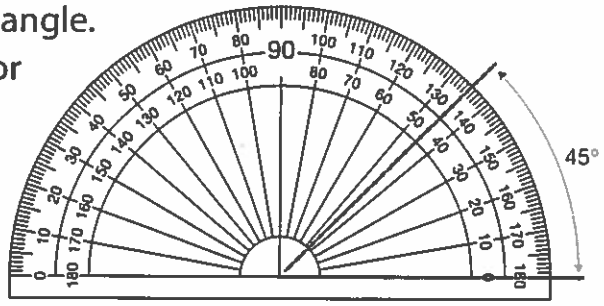
This is a **standard protractor**.
The standard protractor shows angle measures from 0° to 180°, both clockwise and counterclockwise.



Follow these steps to measure an angle with a protractor.

Step 1

Place the protractor on top of the angle.
Line up the centre of the protractor with the vertex of the angle.
Line up the base line of the protractor with one arm of the angle.



Step 2

Find where the other arm of the angle meets the protractor.
Start at 0° on the arm along the base line and read the measure.
This angle measures 45°.

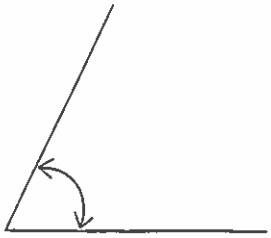
Try These

1. Use a protractor to measure each angle. Record the measurements.

a)

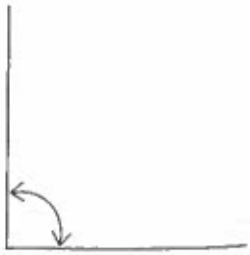
_____

b)



_____

c)

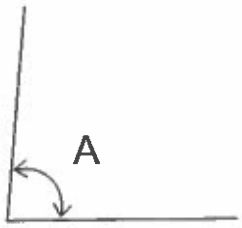


_____

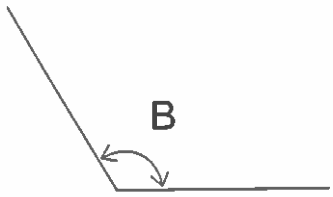
Practice

1. Measure each angle. Record the measurements in the chart.

a)

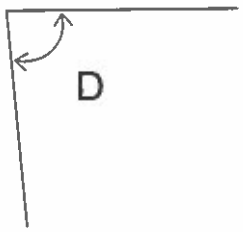


b)



c)

d)



Angle	Measure
A	
B	
C	
D	

2. Use the angle measures from Question 1. Write <, >, or =.

a) B ☐ C **b)** A ☐ D **c)** A ☐ B

3. Use a ruler. Estimate to draw each angle.

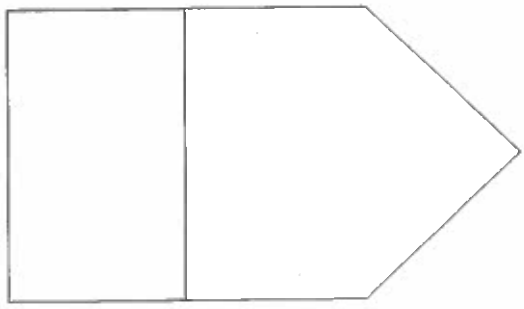
a) a right angle **b)** a 45° angle **c)** a 120° angle

4. Measure each angle you just drew. Record the actual measures.

a) _____ **b)** _____ **c)** _____

Stretch Your Thinking

1. How many of each kind of angle can you find in this picture? Mark each kind in a different colour.



a) 90° _____

b) greater than 90° _____

c) less than 90° _____

UNIT 3

STUDENT BOOK 4 LESSON

Exploring Sides in Quadrilaterals

At Home At School

Quick Review

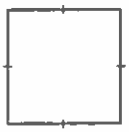
A figure with 4 sides is a **quadrilateral**.

- Some quadrilaterals have 2 pairs of opposite sides that are equal.

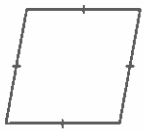
rectangle

parallelogram

A square is a rectangle with 4 sides equal.
A rhombus is a parallelogram with 4 sides equal.
Hatch marks show equal sides.



square

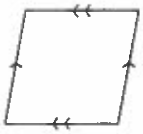


rhombus

- Some quadrilaterals have 2 pairs of parallel sides.
We draw arrows on lines to show parallel sides.

square

rectangle



rhombus

parallelogram

- Trapezoids have 1 pair of parallel sides.

trapezoid

Try These

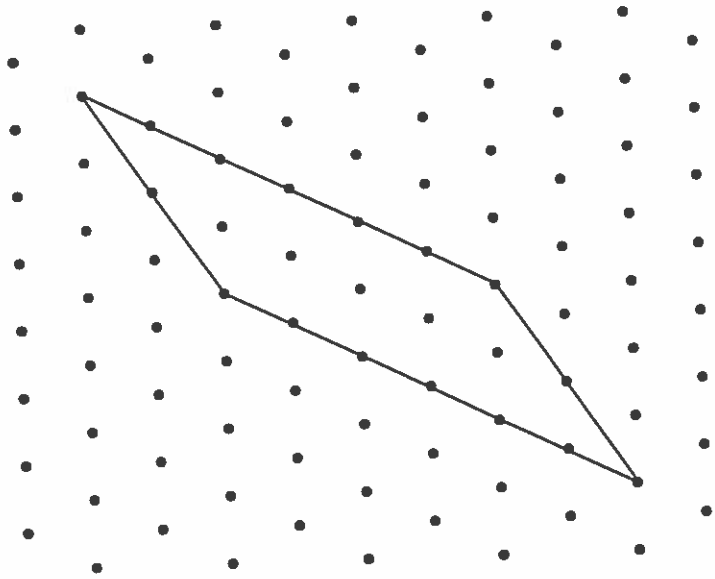
1. Draw 2 different quadrilaterals on the dot paper.
Mark equal sides with hatch marks. Mark parallel sides with arrows.

Practice

1. Play this game with a partner.

You will need:
Dot paper
Pencil

Does it have equal angles?



Player A

➤ Make a quadrilateral on the dot paper without letting your partner see.
The quadrilateral should have at least one pair of equal or parallel sides.

Player B

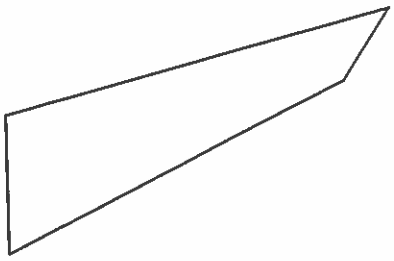
➤ Ask your partner "Yes–No" questions about the quadrilateral.
The questions can be about
- the number of equal sides
- the number of parallel sides
- the diagonals

➤ Keep asking questions until you think you know the quadrilateral.
Guess the quadrilateral. If you are right, you get a point.

Switch roles and play again.
Keep playing until one player has 5 points.

Stretch Your Thinking

Explain why this quadrilateral cannot be called a square, a parallelogram, a rectangle, a rhombus, or a trapezoid.



_____

_____

UNIT 3

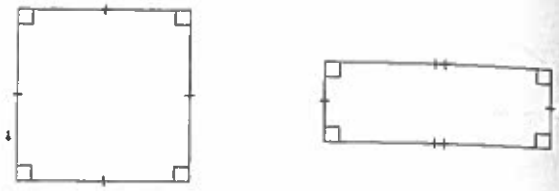
STUDENT BOOK 5 LESSON

Exploring Angles in Quadrilaterals

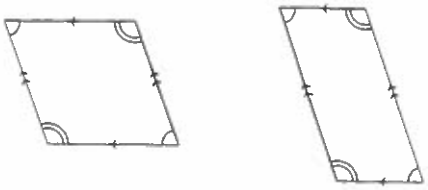
Quick Review

At Home / At School

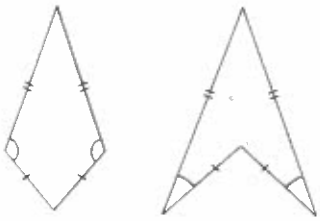
Squares and rectangles have 4 equal angles.
Each angle is 90°.



Parallelograms and rhombuses have opposite angles equal.



Kites have 2 equal angles.



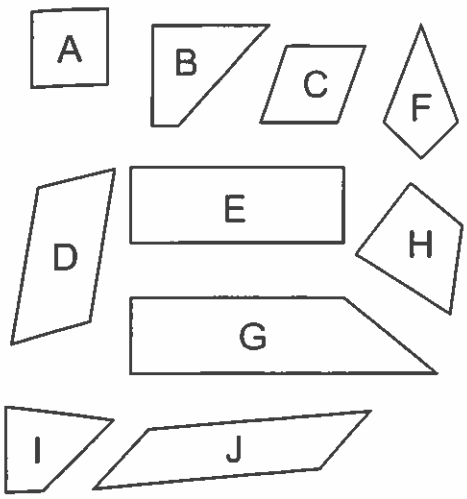
Try These

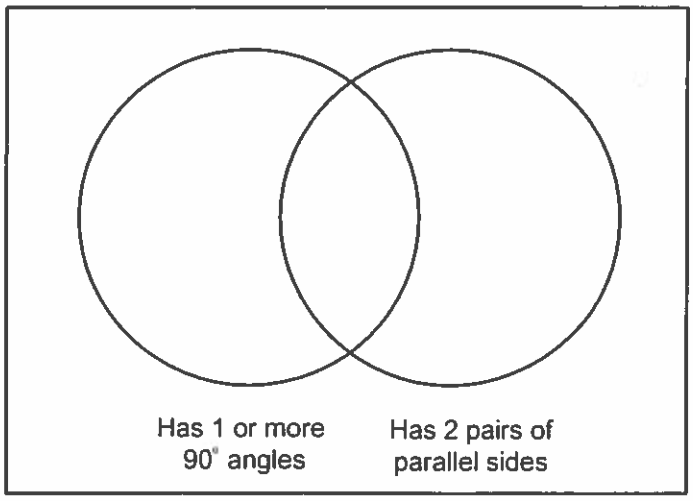
1. Draw a quadrilateral with each attribute.
   a) 4 right angles b) 2 pairs of equal angles c) only 2 right angles

2. Why is a rectangle not a kite?

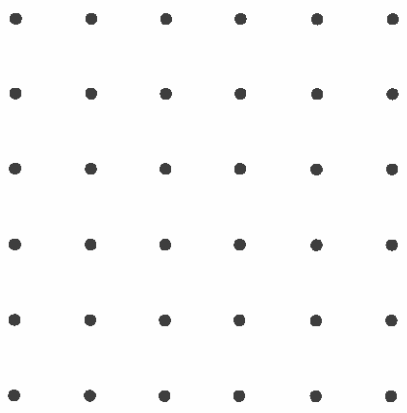
Practice

1. Use the Venn diagram to sort the quadrilaterals.





2. **a)** Draw a trapezoid on the dot grid.



b) Write a statement about your trapezoid that is true.

_____

_____

c) Write a statement about a trapezoid that is never true.

_____

_____

Stretch Your Thinking

Explain why a square is a parallelogram and a rhombus.

_____

_____

_____

UNIT 3

STUDENT BOOK 6 LESSON

Attributes of Quadrilaterals

Quick Review

At Home / At School

Quadrilaterals	Attributes
Trapezoid	1 pair of parallel sides
Parallelogram	2 pairs of parallel sides opposite sides equal opposite angles equal
Rectangle	2 pairs of parallel sides opposite sides equal all right angles
Square	2 pairs of parallel sides all sides equal all right angles
Rhombus	all sides equal opposite angles equal 2 pairs of parallel sides
Kite	2 pairs of equal adjacent sides 1 pair of equal angles

Try These

1. a) How are the figures alike?

_____

_____

_____

A

b) How are they different?

_____

_____

B

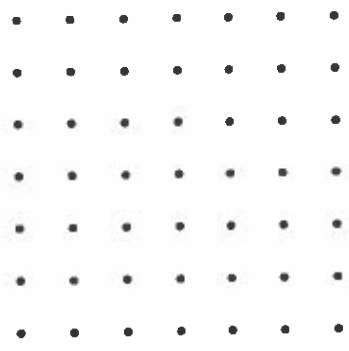
Practice

1. Draw a parallelogram to fit each description.

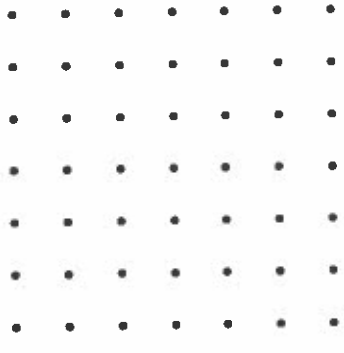
   a) 4 right angles and 4 equal sides

   b) 2 pairs of parallel sides and no right angles

   c) 4 right angles and 2 pairs of equal sides

2. Solve each quadrilateral riddle. There can be more than one answer for each riddle. Can you find all the answers?

   a) I have 1 pair of equal angles.
   I have 2 pairs of equal adjacent sides.

   What am I? _____

   b) I have 2 pairs of parallel sides.
   All of my sides are equal.
   I have no right angles.

   What am I? _____

   c) I have at least 1 pair of parallel sides.
   I have no right angles.

   What am I? _____

Stretch Your Thinking

Jerry said that since a square is a rectangle, then a rectangle must be a square. What would you say to convince Jerry he is not correct?

_____

_____

UNIT 3

STUDENT BOOK 7 LESSON

Similar Figures

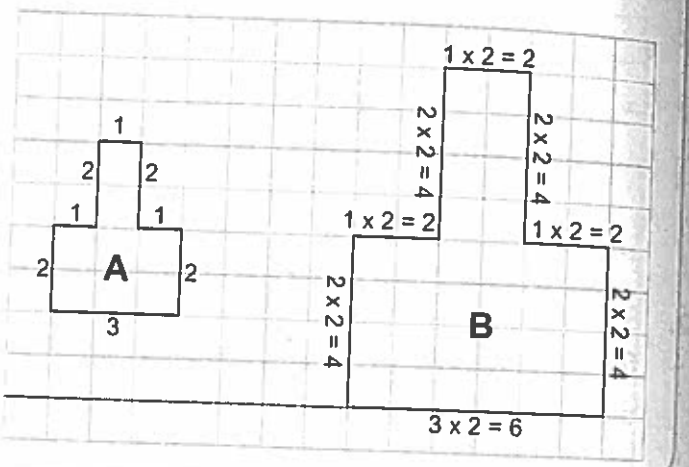
Quick Review

At Home / At School

Similar figures have the same shape.
These figures are similar.
They have the same shape.

Each side of Figure B is 2 times the length of a corresponding side of Figure A.

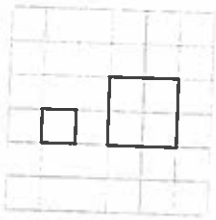
Each angle in Figure B is equal to a corresponding angle in Figure A.



Try These

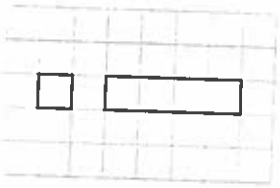
1. Tell if each pair of figures is similar. Write Yes or No.

a)



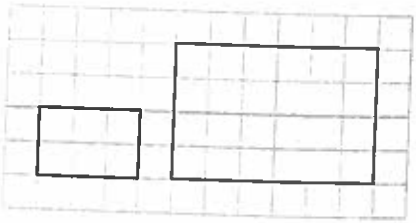
_____

b)



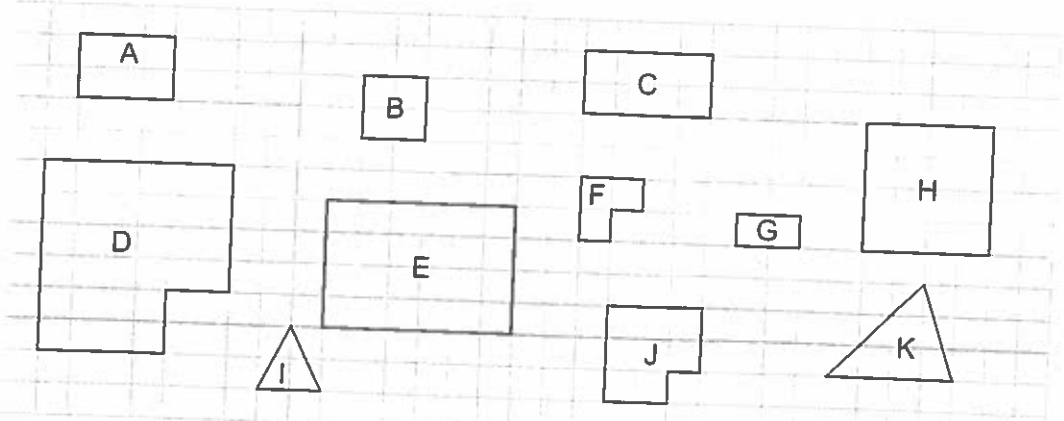
_____

c)



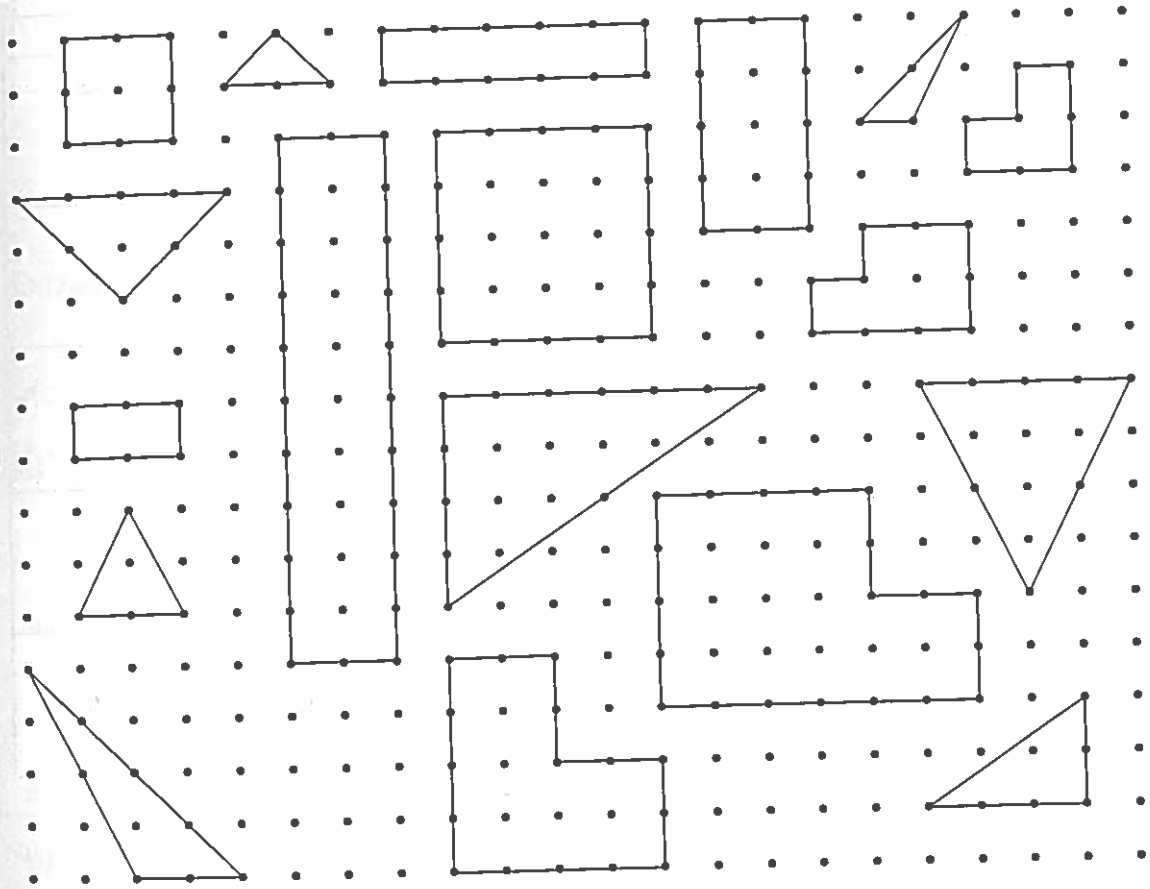
_____

2. Find pairs of similar figures. Join each pair with a line.



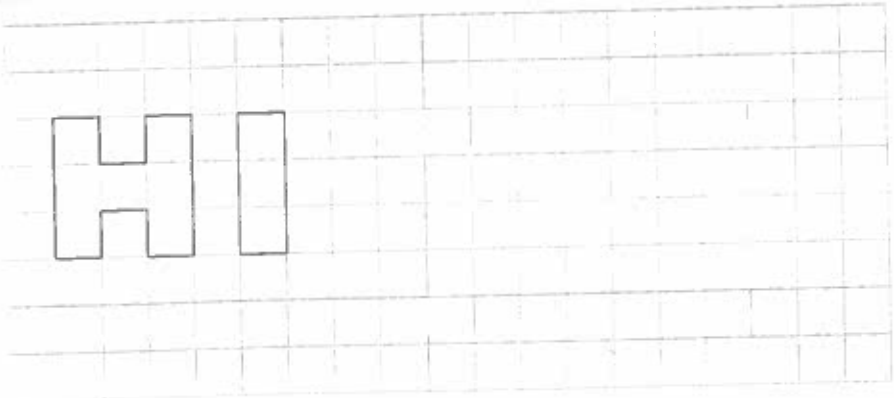
Practice

1. Do this activity with a partner.
   - ➤ Choose any figure on the grid.
   - ➤ Work together to find a figure that is similar.
   - ➤ Once you agree, label each with a letter.
   - ➤ Continue to find pairs of similar figures.
   - ➤ Label each pair with a different letter.



Stretch Your Thinking

Make an *H* and *I* similar to the *H* and *I* on the grid.



UNIT 3

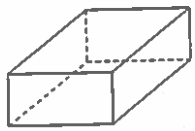
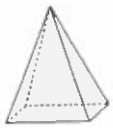
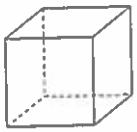
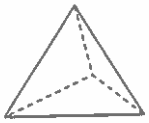
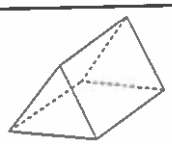
STUDENT BOOK 8 LESSON

Faces of Solids

At Home At School

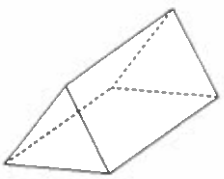
Quick Review

Each surface on a solid is called a **face**.
The base of the figure determines the figure's name.

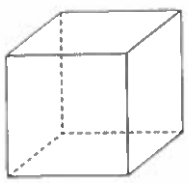
Solid		Faces
	Rectangular prism	3 pairs of congruent rectangles
	Rectangular pyramid	1 rectangle 2 pairs of congruent triangles
	Cube	6 congruent squares
	Triangular pyramid	4 congruent triangles
	Triangular prism	2 congruent triangles 3 congruent rectangles

Try These

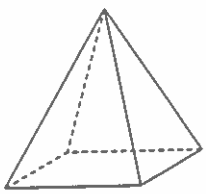
1. Name each solid.

a) 

_____

b) 

_____

c) 

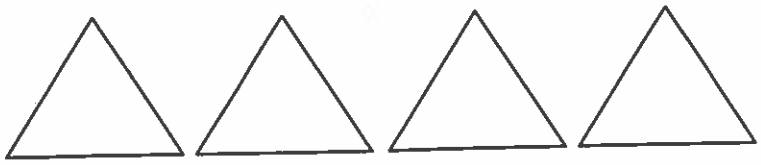
_____

2. Identify the shape of the shaded face of each solid in question 1.

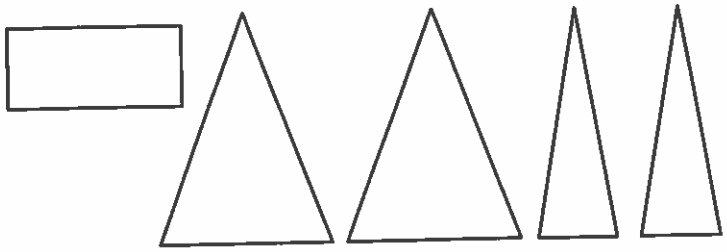
a) _____ b) _____ c) _____

Practice

1. Identify the solid that has each set of faces.

a) 

_____

b) 

_____

2. Explain how you identified the solids from the sets of faces in question 1.

a) _____

b) _____

_____

3. Name 3 solids that have triangular faces.
Tell how many triangular faces each one has.

a) _____

b) _____

c) _____

Stretch Your Thinking

Compare a hexagonal prism and a hexagonal pyramid.
How are they alike? How are they different?

_____

_____

_____

UNIT 3

STUDENT BOOK 9 LESSON

Solids in Our World

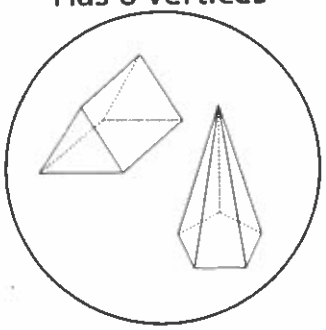
Quick Review

At Home At School

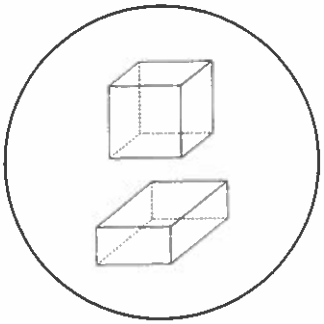
You can sort solids in different ways.

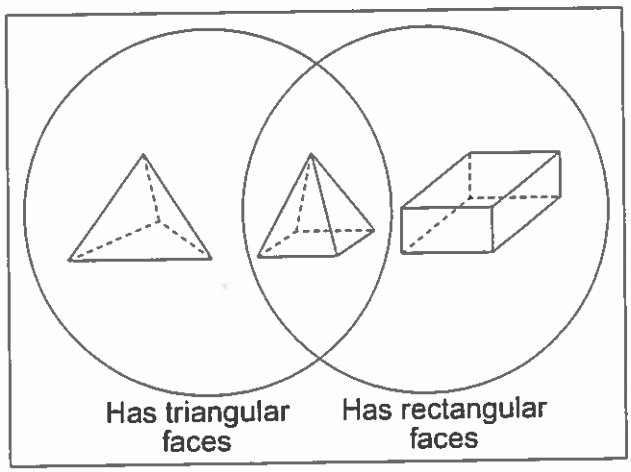
- You can sort by the number of faces, edges, or vertices.
- You can sort by the shapes of the faces.

Has 6 vertices



Has 8 vertices

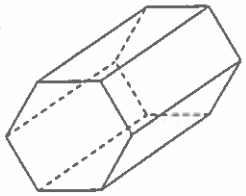




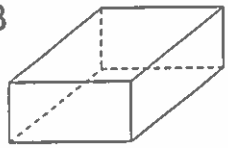
Try These

1. Sort the solids.

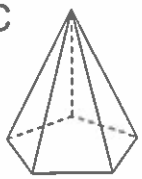
A



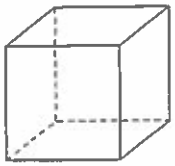
B



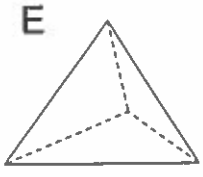
C

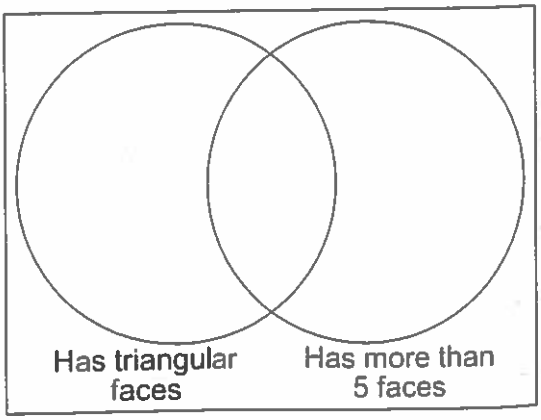


D



E

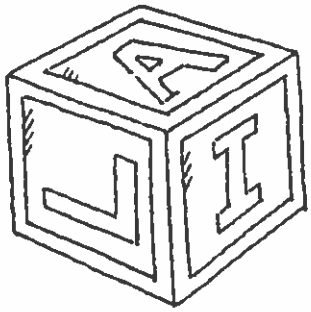




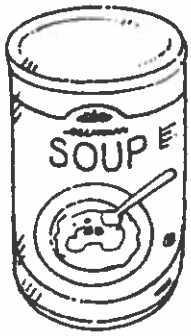
Practice

1. Name the solid that best represents each object.

a)



b)



c)

_____ _____ _____

2. Write the names of one or more solids to answer each riddle.

   a) My 6 faces are rectangular. _____

   b) I have 8 vertices. _____

   c) I have 2 circular faces. _____

3. Look through old magazines or catalogues for 3 small pictures of objects that look like solids. Cut them out and paste them here. Name the solid each object resembles.

_____ _____ _____

Stretch Your Thinking

How can you use the shape of the base of a pyramid to determine the number of faces on the pyramid? Give an example to support your answer.

_____

_____

UNIT 3

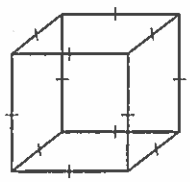
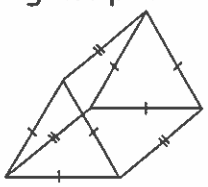
STUDENT BOOK 10 LESSON

Designing Skeletons

Quick Review

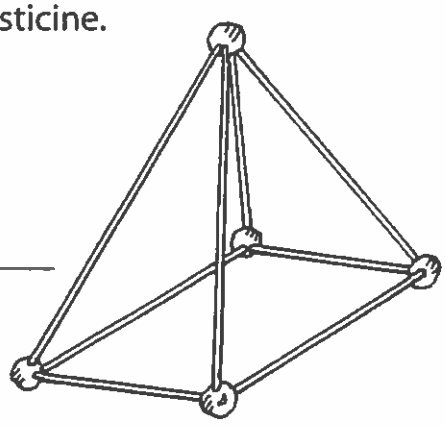
At Home At School

A **skeleton** is a model of a solid showing only the edges and vertices. You describe a skeleton by its number of vertices and equal edges.

Skeleton	Number of Vertices	Types of Edges
Cube 	8	12 equal edges
Triangular prism 	6	3 pairs of equal edges on the triangular bases 3 equal edges joining the bases

Try These

1. This skeleton is made of straws and balls of Plasticine.



a) How many straws does the skeleton have? _____

b) How many balls of Plasticine does the skeleton have? _____

c) Which solid is the skeleton a model of?

_____

2. How many straws and balls of Plasticine would you need to build a triangular prism?

straws _____ balls of Plasticine _____

Practice

1. Use straws or toothpicks and balls of Plasticine.
   Make skeletons of 2 prisms and 2 pyramids.
   At least 2 skeletons should have some triangular faces.
   Sketch and name the skeletons in the boxes below.

2. Tell how many straws and balls of Plasticine you would need to make each skeleton.

Skeleton	Straws	Balls of Plasticine
Cube		
Rectangular pyramid		
Pentagonal pyramid		
Rectangular prism		
Pentagonal prism		

Stretch Your Thinking

1. Suppose you built a pyramid with an octagonal base.

   a) How many straws would you need? _____

   b) How many balls of Plasticine would you need? _____

   c) How many straws would you need if you used whole straws for the side edges and quarter straws for the base edges? _____