Week 6, Day 3
Describe properties of 2-D shapes, including polygons.

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. If possible, watch the PowerPoint presentation with a teacher or another grown-up.

OR start by carefully reading through the Learning Reminders.

2. Tackle the questions on the Practice Sheet. There might be a choice of either Mild (easier) or Hot (harder)!
Check the answers.

3. Finding it tricky? That’s OK… have a go with a grown-up at A Bit Stuck?

4. Think you’ve cracked it? Whizzed through the Practice Sheets? Have a go at the Investigation…
Learning Reminders

Describe properties of 2-D shapes including polygons.

Note how most of the shapes are polygons. Shapes with all straight sides are called polygons. Circles, ovals and semicircles are not polygons even though they are 2-D shapes.
Describe properties of 2-D shapes including polygons.

Some useful vocabulary for describing shapes, this will help you with today’s activities.

- polygon
- regular/irregular
- number of vertices
- number of sides
- right/obtuse/acute angles
- lines of symmetry
Describe properties of 2-D shapes including polygons.

Shape properties – some examples. Can you name the shapes?

1. This has 4 sides and no lines of symmetry.
2 and 3. These shapes are irregular polygons with 5 sides.
4. This shape is not a polygon and has one line of symmetry.
5. This shape has 3 vertices and 1 obtuse angle.
6. This shape has 6 vertices and all the sides are the same length.

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1. i) Which of these is a polygon? ________________
ii) Why? ___________________________________

   A  B  C  D
   □  □  □  □

2. Look at these shapes.

   A  B  C  D  E  F
   □  □  □  □  □  □

Match the shapes to each description below:
A triangle: ______ and ______
A quadrilateral: ______ and ______
A pentagon: ______ and ______
A symmetrical polygon: _______, _______, and ______
A regular polygon: ______ and ______
An irregular polygon: _______, _______, _______, and ______

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Practice Sheet Hot
Properties of 2-D shapes

1. Look at these shapes.

A triangle: _______ and _______
A quadrilateral: _______ and _______
A pentagon: _______ and _______
A symmetrical polygon: _______, _______ and _______
A regular polygon: _______ and _______
An irregular polygon: _______, _______, _______ and _______

2. Which shape is not a hexagon? _______

A hexagon with six sides is not a hexagon. Therefore, the shape that is not a hexagon is _______.

Challenge

Draw four polygons with different numbers of sides. Label them A, B, C and D. Make up a quiz to test whether a partner can describe and identify each, e.g.

1. How many pairs of parallel sides does it have?
2. Name three different types of this shape.
3. How many of me do you need to build a square based pyramid?
Practice Sheets Answers

Properties of 2-D shapes (mild)

1. i) D
   ii) It has all straight sides

2. Match the shapes to each description:
   A triangle:  _B_ and  _C_
   A quadrilateral:  _A_ and  _D_
   A pentagon:  _E_ and  _F_
   A symmetrical polygon:  _C_ ,  _D_ and  _F_
   A regular polygon:  _D_ and  _F_
   An irregular polygon:  _A_ ,  _B_ ,  _C_ and  _E_

Properties of 2-D shapes (hot)

1. Match the shapes to each description:
   A triangle:  _B_ and  _C_
   A quadrilateral:  _A_ and  _D_
   A pentagon:  _E_ and  _F_
   A symmetrical polygon:  _C_ ,  _D_ and  _F_
   A regular polygon:  _D_ and  _F_
   An irregular polygon:  _A_ ,  _B_ ,  _C_ and  _E_

2. C

Challenge

Children should draw four polygons with different numbers of sides and create a quiz to test whether their partner can identify and describe these shapes.
A Bit Stuck?
Odd one out

Ring the odd one out in each set. Write why that shape is different.

Challenge
Draw your own set of four shapes, where one is the odd one out. Ring the odd one out. Write why that shape is different.
**A Bit Stuck? Answers**

**Odd one out**

- **The other shapes are regular polygons.**
- **The other shapes all have at least one right angle.**
- **This is the only shape which doesn’t have at least one straight side.** The semicircle could also be the odd one out as it has both straight and curved sides.
- **The other shapes are all octagons.** The top right could also be the odd one out as it is the only regular polygon.

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Investigation
How many different polygons can you make?

• Using the ‘isometric’ paper, draw five equilateral triangles, where at least one side of every triangle is directly adjacent to another, e.g.

• How many different arrangements of five triangles can you make?

• Eliminate any repeats, reflections and rotations. If you are in doubt about whether one shape is a reflection or rotation of another use this tip!

  TOP TIP!
  Cut out the shape, then try to lay it on top of the other shape by rotating it or flipping it over!

• Draw around the outline of each shape in a different colour, then name each shape and decide whether it is regular or not.

• If it is not regular, is it symmetrical or not?
  e.g. This is an irregular pentagon with no lines of symmetry.

• Can you find and describe at least 6 different shapes?

Challenge
Complete the same activity with three, then four equilateral triangles.
Do you see any patterns or links between the number of triangles used, the number of possible shapes and the number of sides on the polygons created?
Investigation

How many different polygons can you make?