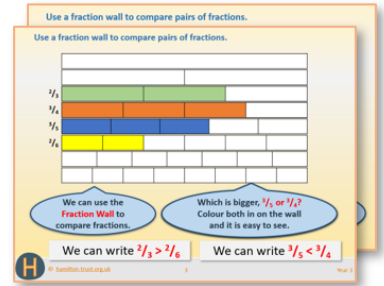


Week 6, Day 4

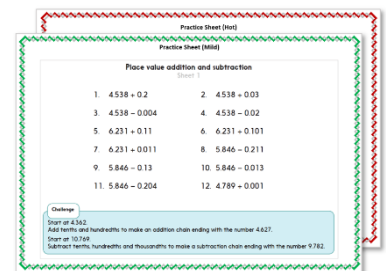
Describe properties of polygons

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

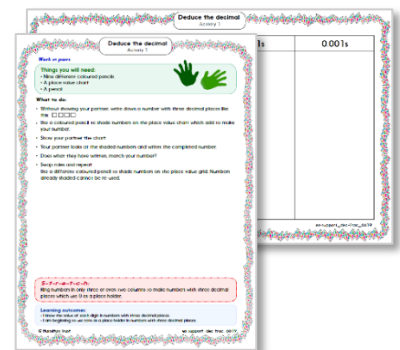
1. Start by reading through the **Learning Reminders**. They come from our *PowerPoint* slides.



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**...

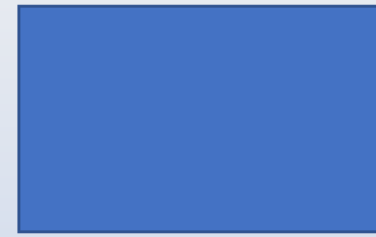
Learning Reminders

Describe properties of polygons.



What makes a shape a polygon?

A polygon is a straight-sided, closed, 2-D shape.



Which one is NOT a polygon?

Learning Reminders

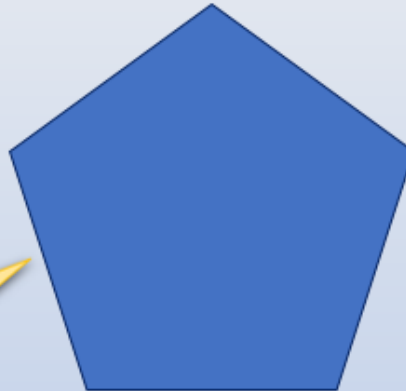
Describe properties of polygons.



This polygon has 3 **acute** angles.



This polygon has 1 **obtuse** angle. Can you spot which one?



This is a **regular** polygon. All 5 sides and angles are equal.

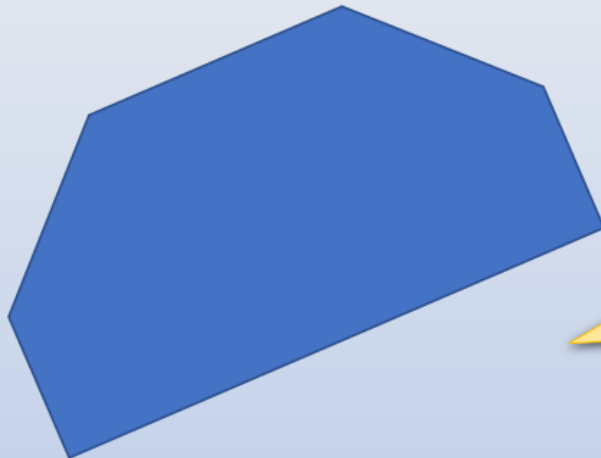
The 2 triangles are **irregular**. Can you see why?

Learning Reminders

Describe properties of polygons.



This shape has one a pair of **parallel sides**, if they were extended they would never meet (like railway tracks) can you see which ones?








This shape has some **perpendicular sides**. This is where 2 of the sides meet at right angles, can you see where that is?

Practice Sheet Mild

Properties of polygons

Complete this table by writing a tick in each box that is 'true'.

	Square 	Equilateral triangle 	Irregular pentagon 	Regular hexagon 	Regular pentagon 
All sides the same length					
One pair of parallel sides					
More than 1 pair of parallel sides					
5 sides					
More than 4 sides					
Less than 5 vertices					

Was there a column that was difficult to complete? Why?







Challenge

Draw a polygon with three sets of parallel sides... And another, with two right angles... And another, with 7 sides.

Practice Sheet Hot

Properties of polygons

Complete this table by writing a tick in each box that is 'true'.

	square 	equilateral triangle 	irregular pentagon 	regular hexagon 	regular pentagon 	octagon 
all sides the same length						
one pair of parallel sides						
more than 1 pair of parallel sides						
5 sides						
more than 4 sides						
less than 5 vertices						
no perpendicular sides						






Was there a column that was difficult to complete? Why?

Challenge

- Sometimes, Always or Never? A polygon with parallel sides also has perpendicular sides.
- Draw a polygon with three sets of parallel sides... And another, with two right angles... And another, with 7 sides.

Practice Sheets Answers







Properties of polygons (mild)

	square 	equilateral triangle 	irregular pentagon 	regular hexagon 	regular pentagon 
all sides the same length	✓	✓		✓	✓
one pair of parallel sides			✓		
more than 1 pair of parallel sides	✓			✓	
5 sides			✓		✓
more than 4 sides			✓	✓	✓
less than 5 vertices	✓	✓			

Challenge

Children's drawings will vary but a shape with 3 sets of parallel sides will be a regular hexagon.

Properties of polygons (hot)

	square 	equilateral triangle 	irregular pentagon 	regular hexagon 	regular pentagon 	octagon 
all sides the same length	✓	✓		✓	✓	✓
one pair of parallel sides			✓			
more than 1 pair of parallel sides	✓			✓		✓
5 sides			✓		✓	
more than 4 sides			✓	✓	✓	✓
less than 5 vertices	✓	✓				
no perpendicular sides		✓		✓	✓	✓

Challenge

- A polygon with parallel sides **sometimes** has perpendicular sides. (For example rectangles have both parallel and perpendicular sides but the regular hexagon drawn on the grid has parallel sides but no perpendicular ones).
- Children's drawings will vary but a shape with 3 sets of parallel sides will be a regular hexagon.

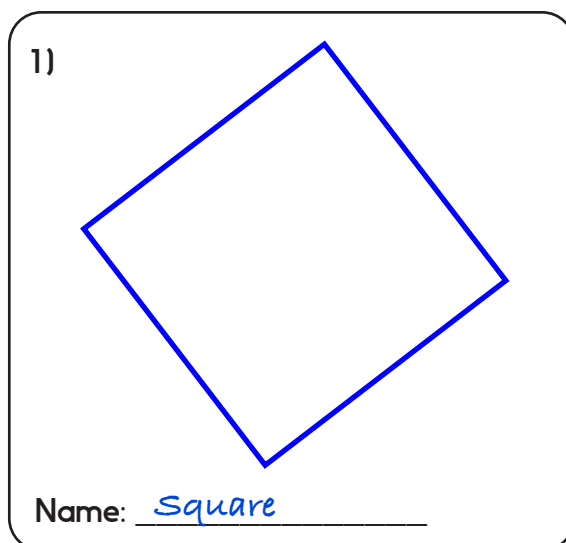
A Bit Stuck?

Shape properties

Draw a shape to match each description.
Write the name of your shape.

1. Has four sides, all four sides are the same length, and has four right angles.
2. Has six sides, all six sides are the same length, and has six obtuse angles.
3. Has five sides and one line of symmetry.
4. Has seven sides, has two right angles and no lines of symmetry.
5. Has five sides, all five sides are the same length, and has at least one line of symmetry.
6. Has eight vertices and no lines of symmetry.
7. Has seven vertices, has seven sides all the same length, has no acute angles or right angles.
8. Has six sides and six vertices, has three right angles.

e.g.



A Bit Stuck?

Shape properties

1)

Name: _____

2)

Name: _____

3)

Name: _____

4)

Name: _____

5)

Name: _____

6)

Name: _____

7)

Name: _____

8)

Name: _____

A Bit Stuck? Answers

Shape properties

1. Square



2. Regular hexagon



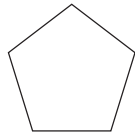
3. Irregular pentagon
e.g.



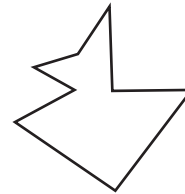
4. Irregular heptagon
e.g.



5. Regular pentagon
e.g.



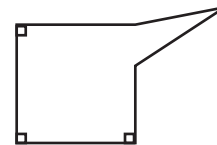
6. Irregular octagon
e.g.



7. Regular heptagon
e.g.



8. Irregular hexagon
e.g.



Investigation

Draw your own

1. Have a go at drawing polygons with:

3 sides

4 sides

5 sides

6 sides

8 sides

with the following properties:

- one pair of parallel sides
- two pairs of parallel sides
- one pair of perpendicular sides
- two pairs of perpendicular sides.

Make a note of which combinations are and which aren't possible...

Handy Hints!

Try drawing a pair of parallel lines or perpendicular lines, *then* extending this to form a polygon...

Investigate systematically, maybe exploring each shape in order of the number of sides

2. Triangle Challenge!

What happens if you try to draw:

- A triangle with a pair of parallel lines?
- A triangle with two pairs of perpendicular lines?
- A triangle with two right angles?

3. Can you identify any 'impossible' quadrilaterals?