Edward Peake Church of England Middle School			
Topic: Properties of Shape		**Year: 5**	**NC Strand: Geometry**

What should I already know?

- How to compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
- How to identify acute and obtuse angles and compare and order angles up to two right angles by size
- How to identify lines of symmetry in 2-D shapes presented in different orientations
- How to complete a simple symmetric figure with respect to a specific line of symmetry.

What will I know by the end of the unit?

- How to measure angles in degrees
- How to measure with a protractor
- How to draw lines and angles accurately
- How to calculate angles on a straight line
- How to calculate angles around a point
- How to calculate lengths and angles in shapes
- How to describe regular and irregular polygons
- How to Reason about 3-D shapes

Vocabulary

Angle	Horizontal	Irregular	Edge
Right angle	Vertical	Two-dimensional	Curved Edge
Obtuse	parallel	Three Dimensional	Vertice
Acute	Perpendicular	Flat Face	Side
Reflex	Polygon	Curved Surface	Face
Protractor	Regular		

Investigate/Homework tasks

- Homework will be set by your teacher using google classroom
- You should complete at least 30 minutes of maths tasks using the website and log in provided by your teacher. Please attend help sessions if you do not have access to the internet at home
- Additional work you could complete:
    - Find out more about the meaning of the vocabulary list using http://www.amathsdictionaryforkids.com/
- To challenge yourself: Answer the key questions to deepen your knowledge

Key Information/Diagrams

Properties of 3D Shapes

Name	Surfaces		Edges		Vertices	Picture
	Flat	Curved	Flat	Curved		
sphere	0	1	0	0	0	
cube	6	0	12	0	8	
cuboid	6	0	12	0	8	
cone	1	1	0	1	0	
cylinder	2	1	0	2	0	
square-based pyramid	5	0	8	0	5	
tetrahedron	4	0	6	0	4	
triangular prism	5	0	9	0	6	

Identifying Angles

Acute Angles
Any angle that measures less than 90° is called an **acute** angle.

Obtuse Angles
Any angle that measures greater than 90° and less than 180° is called an **obtuse** angle.

Reflex Angles
Any angle that measures greater than 180° is called a **reflex** angle.

117°
63°
Angles on a straight line always total 180°.

205°
65°
60°
30°
Angles around a point always total 360°.

Multiples of 90° can be used as descriptions of a turn.

¼ turn = 90°   ½ turn = 180°   ¾ turn = 270°   1 turn = 360°

Measuring and Drawing Angles
To measure angles, we use a protractor. Look carefully at how the numbers on the scale count from 0° to 180° in both directions.

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Regular and Irregular Polygons

Regular	Irregular

A polygon is any two-dimensional shape formed with straight lines.

In a regular polygon, all the sides and angles are equal.

In an irregular polygon, the sides and angles are not equal.

Representations

Cube models can be drawn as 2D representations using different elevations.

Plan

Side Elevation

Front Elevation

Plan

Front Elevation

Side Elevation
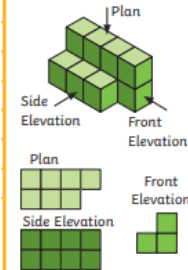
A shape net is a 2D drawing of an unfolded 3D shape. When you are drawing or reasoning about shape nets, think carefully about where the edges of the faces meet.

Shape net of a tetrahedron.
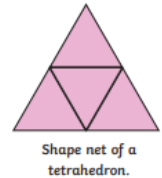
Key Questions

What is an angle?

Can you identify an acute angle on the clock?

Can you identify an obtuse angle?

What do we call angles larger than 180° but smaller than 360°?

What angles can you identify using compass directions?

What is the size of the angle?

What fraction of a full turn is the angle?

How do you know an angle is obtuse?

Can you see where obtuse angles would be measured on the protractor?

Can you estimate the size of this angle?

What is the size of the angle? What mistake might someone make?

Where will you place your protractor first?

How many millimetres are in a centimetre?

How do we draw a line that measures ___?

Explain how to draw an angle.

Using Properties of Rectangles

W   angles of
8

6cm

7cm 2cm

6cm   8cm   6cm + 2cm = 8cm

7cm + 6cm = 13cm

13cm

H   e lines
h

How many right angles are there in $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ of a full turn?

If you know a half turn/full turn is 180/360 degrees, how can this help you calculate the missing angle?

What is the most efficient way to calculate a missing angle? Would you use a mental or written method?

When you have several angles, is it better to add them first or to subtract them one by one?

Look at the rectangle and square, where can you see parallel lines? How many right angles do they have?

What can you say about the lengths of the sides in a rectangle or in a _____?

If I fold a square in half diagonally to make a triangle, what will the size of each of the angles in the triangle be?

Using what you know about squares and rectangles, how can you calculate the sizes of the angles?

What is a polygon?

Can a polygon have a curved line?

Name a shape which isn't a polygon.

What makes a polygon irregular or regular?

Is a square regular?

Are all hexagons regular?