Topic Sequence: Lines and Angles

11	12
Constructing, measuring and using geometric notation	Developing geometric reasoning

Topic Overview: Constructing, measuring and using geometric notation

Students will build on their KS2 skills using rulers, protractors and other measuring equipment to construct and measure increasingly complex diagrams using correct mathematical notation. This will include three letter notation for angles, the use of hatch marks to indicate equality and the use of arrows to indicate parallel lines. Pie charts will be studied here to gain further practice at drawing and measuring angles.

Learning Sequence:

Letter and labeling conventions Students will be able to describe a line segment and geometric figures using letter notation. They will always use a capital letter to define a line segment and three letters for angles. Polygons will be described by naming the vertices cyclically and often but not always in alphabetical order.

Draw and measure line segments During this step students will measure line segments within geometric figures to an accuracy of up to 1mm. They will be expected to convert freely between metric units and will measure objects within the classroom and the wider environment and be able to justify the unit used

Angles as a measure of turn This step ensures that students understand that angles are a measure of turn. Thy will understand that an angle is formed by two lines meeting at a point. A variety of language will be used to describe the size and direction of a turn.

Classify angles Students will be able to classify angles by sight including within geometric figures. They will be able to use conventional markings for right angles. They will also be introduced to the vocabulary of interior and exterior angles.

Measure angles up to 180º Students will use a protractor graduated in degrees to measure angles up to 180º including with geometric figures. Accuracy of measurement should be within a degree. Students will also be able to estimate angles by comparing them to 90º and 180º.

Draw angles up to 180º Students will draw angles up to 180º with a ruler and protractor. They will be able to construct the angle either at a point or a line or at the end of a line segment. As with measuring they should be drawn with an accuracy of a degree. When checking they will make comparisons with 90º and 180º.

Measure and draw 180º to 360º Students will develop their skills during the previous step. Accuracy should be within a degree.

Perpendicular and parallel lines Student will be able to identify parallel and perpendicular lines including those in geometric figures. They will use the correct notation to show where they have been identified

Recognise types of triangles Students will be able to identify types of triangles. They will be familiar with the properties from before, they will be able to measure lengths and angles in triangles in order to classify them.

Recognise types of quadrilaterals This step will revisit and consolidate their prior knowledge. They will be able to fluently distinguish between types of quadrilaterals using appropriate terminology to justify their decisions.

Identify polygons up to a decagon Students will identify polygons up to a decagon. They will distinguish between regular and irregular polygons, ensuring they have the correct definition. They will relate vocabulary with other parts of mathematics and the real world.

Construct triangle – SSS Students will understand how to construct a triangle with 3 sides given. They will explore this with just a ruler to begin with to highlight inaccuracy. Students will be able to explain why a certain set of side lengths will not make a triangle.

Construct triangle – SSS, SAS and ASA Students will learn the phrase side-side-side, side-angle-side and angle-side-angle. They will also understand why they represent the minimum information to draw a distinct triangle. They will be exposed to ambiguous cases when it is possible to draw two distinct triangles given the information.

Construct more complex polygons Students will be able to draw more complex polygons and diagrams constructed using multiple polygons. This step will recap perimeter also. Letter notation will continue to be used for line segments, polygons and angles.

Interpret pie charts using proportion Students will interpret pie charts divided into equal proportions given the whole or part of the frequency. Students will be able to make comparisons between multiple pie charts. Students will know that although they are comparing proportions they are not comparing frequencies.

Interpret pie charts using protractor Students will extend the skills from the previous step to interpret pie charts given the angle for each section.

Draw pie charts Students will be able to draw pie charts given a complete or incomplete frequency table, they will consider whether a pie chart is the best representation of the given data.

Sequence of Learning:		Topic Resources:	
1	Understand and use letter and labeling conventions including those for geometric figures	Knowledge Maps:	Angle Constructions 2D shapes
2	Draw and measure line segments including geometric figures		
3	Understand angles as a measure of turn		
4	Classify angles		
5	Measure angles up to 180°		
6	Draw angles up to 180°	Assessment:	
7	Draw and measure angles between 180° and 360°		
8	Identify perpendicular and parallel lines	Knowledge:	End of Topic test
9	Recognise types of triangle		
10	Recognise types of quadrilateral	Application of Knowledge:	Termly mixed topic assessment
11	Identify polygons up to a decagon		
12	Construct triangles using SSS	Supportive Reading:	
13	Construct triangles using SSS, SAS and ASA	Any supported reading listed here	Sparx Maths www.sparxmaths.co.uk
14	Construct more complex polygons		
15	Interpret simple pie charts using proportion		Corbett Maths : www.corbettmaths.com
16	Interpret pie charts using a protractor		AQA Revision Guide
17	Draw pie charts		