

# Scheme of Learning: Year 7 Summer Term

## Topic Sequence: Lines and Angles

<b>11</b>	<b>12</b>
<b>Constructing, measuring and using geometric notation</b>	<b>Developing geometric reasoning</b>

## Topic Overview: Developing geometric reasoning

This block covers basic geometric language, names and properties of types of triangles and quadrilaterals, and the names of other polygons. Angles rules will be introduced and used to form short chains of reasoning. The higher strand will take this further, investigating and using parallel line rules.

## Learning Sequence:

**Sum of angles at a point** Students will know that angles at a point sum to  $360^\circ$ . They will understand that this is a definition and that it is not possible to prove this. Interactive software will be used by teachers and students to demonstrate and explore this step.

**Sum of angles on a straight line** Students will know that angles at a point on a straight line sum to  $180^\circ$ . They will recognise when this fact can or cannot be applied. Non-examples will be used to demonstrate this step and will allow the students to explore when this rule can and cannot be applied.

**Vertically opposite angles** Students will know that vertically opposite angles are equal. They will understand that vertically opposite angles are formed when two or more lines intersect at a point. They will be able to show that vertically opposite angles are equal by considering angles at a point on a straight line.

**Sum of angles in a triangle** Students will know that the interior angles in a triangle sum to  $180^\circ$ . Students may be familiar with and may investigate tearing the corners from a triangle and using them to form  $180^\circ$ .

**Sum of angles in a quadrilateral** Students will know and be able to derive that the sum of angles in a quadrilateral is  $360^\circ$ . Both convex and concave quadrilaterals will be considered. Students will derive the angle sum by considering a quadrilateral as two triangles. Students will revisit the properties of quadrilaterals.

**Angles problems** Students will use one known angle fact to find a missing angle. The focus will be on reasoning which angle fact should be applied to each scenario. Justifications using the correct vocabulary and notation will be used throughout.

**Complex angle problems** This step considers angle problems where two or more known angle facts need to be applied to a problem. Students will always give reasons for their solutions ensuring that they use the correct vocabulary. Different chains of reasoning will be explored alongside discussion of which are the most effective methods.

**Angle sum of polygons (H)** Students will know how to find and use the angle sum of any polygon. They will investigate interior and exterior angles at vertices. They will investigate sums by partitioning polygons into triangles from a single vertex.

**Angles in parallel lines (H)** Students will investigate angles in parallel lines by measuring. They will not formally consider parallel line angle rules during this step. Students will make and test conjectures. They will be encouraged to use the known angle facts to justify any of their conjectures.

**Parallel line angles rules (H)** Students will build on the previous step by looking formally at alternate, corresponding and co-interior angles. They will be able to identify these types of angles and use them to find other angles in parallel lines. Students will also be aware of the converse, e.g. if a pair of corresponding angles are equal then the lines are parallel.

**Simple proofs (H)** Students need to be able to obtain simple proof using known facts from previous steps. They will explore the difference between a demonstration and a proof. They will be shown the proof that angles in a triangle add up to  $180^\circ$  and they will be encouraged to discuss about efficiency and generalisation.

Sequence of Learning:		Topic Resources:	
<b>1</b>	Understand and use the sum of angles at a point	<b>Knowledge Maps:</b>	Angles 2D shapes
<b>2</b>	Understand and use the sum of angles on a straight line		
<b>3</b>	Understand and use the equality of vertically opposite angles	<b>Assessment:</b>	
<b>4</b>	Know and apply the sum of angles in a triangle	<b>Knowledge:</b>	End of Topic test
<b>5</b>	Know and apply the sum of angles in a quadrilateral	<b>Application of Knowledge:</b>	Termly mixed topic assessment
<b>6</b>	Solve angle problems using properties of triangles and quadrilaterals	<b>Supportive Reading:</b>	
<b>7</b>	Solve complex angle problems	<b>Any supported reading listed here</b>	Sparx Maths <a href="http://www.sparxmaths.co.uk">www.sparxmaths.co.uk</a>
<b>8</b>	Find and use the angle sum of any polygon (H)		Corbett Maths : <a href="http://www.corbettmaths.com">www.corbettmaths.com</a>
<b>9</b>	Understand and use parallel line angle rules (H)		
<b>10</b>	Investigate angles in parallel lines (H)		
<b>11</b>	Use known facts to obtain simple proofs(H)		AQA Revision Guide