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| **Key Topics and Learning Sequence**  |
| **= First Steps** |  **= Moving On** |  **= Stretch** |  **= Challenge** |
| **1. Recap of basic angle properties** 1. Can define a point, line, line segment, ray and angle
2. Can appreciate the historical development of angle measures
3. Know basic angle facts such as angles around a point, on a line, opposite angles
4. Know facts about corresponding, alternate and co-interior angles in parallel lines
5. Know that and understand why the angle sum in any triangle is 1800

Know and understand how to find the exterior and interior angles of regular polygons   | **2. Translations** 1. Understand what a translation is and that it leaves angles, a measure of rotation, unchanged
2. Understand the notation for column vectors
3. Describe translations as 2D vectors
4. Apply a column vector to a given line
5. Describe the translation between two given line segments
6. Can use basic vector arithmetic to combine translations

  | **3. Rotation**1. Know that angle is a measure of rotation
2. Know that a rotation must have a size, centre and sense
3. Can rotate a line segment on the coordinate axis centre (0,0)
4. Can rotate a line segment on the coordinate axis given a point
5. Understand how to rotate a line segment clockwise/anticlockwise
6. Describe the rotation transformation between two given objects
 |  **4. Enlargement**1. Understand what an enlargement is and why it must have a centre and scale factor
2. Understand positive, negative and fractional scale factors
3. Can apply enlargements of a positive integer scale factor to an object
4. Can apply enlargements of fractional scale factors to any object
5. Can apply enlargements with negative scale factors to an object

Can find the centre of enlargement geometrically given two similar objects  |  **5. Reflections and combined transformations**1. Understand lines of symmetry/mirror lines
2. Reflect a shape on a coordinate axis
3. Define the line of reflection as an equation
4. Can reflect a shape given the equation of the mirror line
5. Describe the reflection transformation between two given congruent objects
6. Can begin to combine transformations and understand how to represent a combined transformation as a single transformation
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| **How does this unit fit into your mathematical learning journey?** | **Further Exploration, Enrichment and Cultural Capital** |
| **Reasoning** in mathematics is an especially important skill and one which is applied in many areas. You first developed this skill during your **Proportional Reasoning** unit in **Year 7,** **Geometric Reasoning 1** in **Year 8,** and recently in the **Similarity** unit. You will recall these skills later in **Year 10** when looking at **Graphs and Functions**, **Constructions** and **Proportional Reasoning**.  | Reading: ‘Geometry: A History from Practice to Abstraction’ <https://nrich.maths.org/6352> Enrichment: Explore the Babylonians 1. Explore who the Babylonians were
2. Explore their number system and why they chose it
3. Explore other forms of measuring angles apart from degrees

**Cultural Capital:**  Visit the Tate and go view artwork by the artist Piet Mondrian. How does this connect to this unit of work? |

**LPS Mathematics: Year 9 Unit 5 – Geometric Reasoning Enquiry Question: When is a line, not a line?**

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**Date: Initial Thoughts:**

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**Date: New Thoughts:**

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**Date: Final Thoughts:**

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