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| **H Unit 8: Transformations, constructions, loci and bearings** | **Road Map** |
| In this unit you will learn about geometry & measures. The aims are as follows:**LG1**: Knowledge**LG2**: Application**LG3**: Skills | Assessment Grades |  |  |
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| **Themes** | **Learning Goals/Outcomes/Content** |  |  |  |
| 8a Transformations | Distinguish properties that are preserved under particular transformations;  |  |  |  |
| Recognise and describe rotations – know that that they are specified by a centre and an angle;  |  |  |  |
| Rotate 2D shapes using the origin or any other point (not necessarily on a coordinate grid);  |  |  |  |
| Identify the equation of a line of symmetry;  |  |  |  |
| Recognise and describe reflections on a coordinate grid – know to include the mirror line as a simple algebraic equation, *x* = *a*, *y* = *a*, *y* = *x*, *y* = –*x* and lines not parallel to the axes;  |  |  |  |
| Reflect 2D shapes using specified mirror lines including lines parallel to the axes and also *y* = *x* and *y* = –*x*; |  |  |  |
| Recognise and describe single translations using column vectors on a coordinate grid; |  |  |  |
| Translate a given shape by a vector;  |  |  |  |
| Understand the effect of one translation followed by another, in terms of column vectors (to introduce vectors in a concrete way);  |  |  |  |
| Enlarge a shape on a grid without a centre specified;  |  |  |  |
| Describe and transform 2D shapes using enlargements by a positive integer, positive fractional, and negative scale factor;  |  |  |  |
| Know that an enlargement on a grid is specified by a centre and a scale factor;  |  |  |  |
| Identify the scale factor of an enlargement of a shape;  |  |  |  |
| Enlarge a given shape using a given centre as the centre of enlargement by counting distances from centre, and find the centre of enlargement by drawing;  |  |  |  |
| Find areas after enlargement and compare with before enlargement, to deduce multiplicative relationship (area scale factor); given the areas of two shapes, one an enlargement of the other, find the scale factor of the enlargement (whole number values only); |  |  |  |
| Use congruence to show that translations, rotations and reflections preserve length and angle, so that any figure is congruent to its image under any of these transformations;  |  |  |  |
| Describe and transform 2D shapes using combined rotations, reflections, translations, or enlargements; |  |  |  |
| Describe the changes and invariance achieved by combinations of rotations, reflections and translations. |  |  |  |
| Find areas after enlargement and compare with before enlargement, to deduce multiplicative relationship (area scale factor); given the areas of two shapes, one an enlargement of the other, find the scale factor of the enlargement (whole number values only); |  |  |  |
| Use congruence to show that translations, rotations and reflections preserve length and angle, so that any figure is congruent to its image under any of these transformations;  |  |  |  |

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| 8b Constructions, loci and bearings | Draw 3D shapes using isometric grids; |  |  |  |
| Understand and draw front and side elevations and plans of shapes made from simple solids;  |  |  |  |
| Given the front and side elevations and the plan of a solid, draw a sketch of the 3D solid;  |  |  |  |
| Use and interpret maps and scale drawings, using a variety of scales and units;  |  |  |  |
| Read and construct scale drawings, drawing lines and shapes to scale; |  |  |  |
| Estimate lengths using a scale diagram;  |  |  |  |
| Understand, draw and measure bearings;  |  |  |  |
| Calculate bearings and solve bearings problems, including on scaled maps, and find/mark and measure bearings  |  |  |  |
| Use the standard ruler and compass constructions:  |  |  |  |
| bisect a given angle; |  |  |  |
| construct a perpendicular to a given line from/at a given point; |  |  |  |
| construct angles of 90°, 45°; |  |  |  |
| perpendicular bisector of a line segment; |  |  |  |
| Construct: |  |  |  |
| a region bounded by a circle and an intersecting line; |  |  |  |
| a given distance from a point and a given distance from a line; |  |  |  |
| equal distances from two points or two line segments; |  |  |  |
| regions which may be defined by ‘nearer to’ or ‘greater than’; |  |  |  |
| Find and describe regions satisfying a combination of loci, including in 3D; |  |  |  |
| Use constructions to solve loci problems including with bearings; |  |  |  |
| Know that the perpendicular distance from a point to a line is the shortest distance to the line.  |  |  |  |

**Links:**

LG1: You will carry out reflections, rotations, translations and enlargements. You will draw and recognise 3d shapes and elevations of 3d shapes. You will work with bearings and scale drawings.

LG2: You will apply your knowledge of transformations to describe transformations and combinations of transformations. You will solve problems involving loci.

LG3: You will solve problems that combine knowledge and skills from this topic with other topics, such as combining trigonometry with bearings.