



Essential Knowledge	Teaching Points
<ul style="list-style-type: none"><li>• Understand and use SSS, SAS, ASA and RHS conditions to prove the congruence of triangles using formal arguments, and to verify standard ruler and pair of compasses constructions;</li><li>• Solve angle problems by first proving congruence;</li><li>• Understand similarity of triangles and of other plane shapes, and use this to make geometric inferences;</li><li>• Prove that two shapes are similar by showing that all corresponding angles are equal in size and/or lengths of sides are in the same ratio/one is an enlargement of the other, giving the scale factor;</li><li>• Use formal geometric proof for the similarity of two given triangles;</li><li>• Understand the effect of enlargement on angles, perimeter, area and volume of shapes and solids;</li><li>• Identify the scale factor of an enlargement of a similar shape as the ratio of the lengths of two corresponding sides, using integer or fraction scale factors;</li><li>• Write the lengths, areas and volumes of two shapes as ratios in their simplest form;</li><li>• Find missing lengths, areas and volumes in similar 3D solids;</li><li>• Know the relationships between linear, area and volume scale factors of mathematically similar shapes and solids;</li><li>• Use the relationship between enlargement and areas and volumes of simple shapes and solids;</li><li>• Solve problems involving frustums of cones where you have to find missing lengths first using similar triangles.</li></ul>	<ul style="list-style-type: none"><li>• Students must recognise that all corresponding angles in similar shapes are equal in size when the corresponding lengths of sides are not.</li><li>• Students must understand that enlargement does not have the same effect on area and volume.</li><li>• Understand, from the experience of constructing them, that triangles satisfying SSS, SAS, ASA and RHS are unique, but SSA triangles are not.</li><li>• Encourage students to model consider what happens to the area when a 1 cm square is enlarged by a scale factor of 3.</li><li>• Ensure that examples involving given volumes are used, requiring the cube root being calculated to find the length scale factor.</li><li>• Make links between similarity and trigonometric ratios.</li></ul>
Assumed Prior Knowledge/ Links / Interleaving	
<ul style="list-style-type: none"><li>• Students should be able to recognise and enlarge shapes and calculate scale factors.</li><li>• Students should have knowledge of how to calculate area and volume in various metric measures.</li><li>• Students should be able to measure lines and angles, and use compasses, ruler and protractor to construct standard constructions.</li></ul>	

<b>Potential Barriers to Access / Misconceptions</b>	<b>Opportunities for Reasoning/Problem Solving/Proofs</b>
<ul style="list-style-type: none"> <li>Students commonly use the same scale factor for length, area and volume</li> </ul>	<ul style="list-style-type: none"> <li>Multi-step questions which require calculating missing lengths of similar shapes prior to calculating area of the shape, or using this information in trigonometry or Pythagoras problems.</li> </ul>
<b>Key Mathematical Vocabulary</b>	Congruence, side, angle, compass, construction, shape, volume, length, area, volume, scale factor, enlargement, similar, perimeter, frustum