

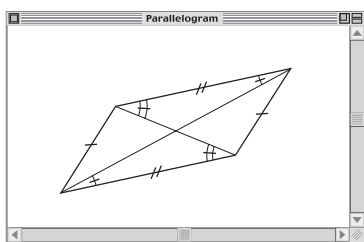
As outcomes, Year 8 pupils should, for example:

Use vocabulary from previous year and extend to: bisect, bisector, mid-point... congruent... tessellate, tessellation...

Visualise and sketch 2-D shapes in different orientations, or draw them using **dynamic geometry software**. Describe what happens and use the properties of shapes to explain why.

For example:

- Imagine a rectangular sheet of paper. Cut along the diagonal to make two triangles. Place the diagonals together in a different way. What shape is formed?
- Imagine two equilateral triangles, placed together, edge to edge. What shape is formed? Why? Add a third equilateral triangle... a fourth... What shapes are formed? Sketch some diagrams and explain what can be seen.
- Imagine two congruent isosceles triangles. Put sides of equal length together. Describe the resulting shape. Is it the only possibility?
- Imagine a quadrilateral with two lines of symmetry. What could it be? Suppose it also has rotation symmetry of order 2. What could it be now?
- Construct a parallelogram by drawing two line segments from a common end-point. Draw parallel lines to form the other two sides. Draw the two diagonals.



Observe the sides, angles and diagonals as the parallelogram is changed by dragging its vertices.

- Describe tilings and other geometrical patterns in pictures and posters. Suggest reasons why objects in the environment (natural or constructed) take particular shapes.
- Explore tessellations using plastic or card polygon shapes and/or **computer tiling software**, and explain why certain shapes tessellate.

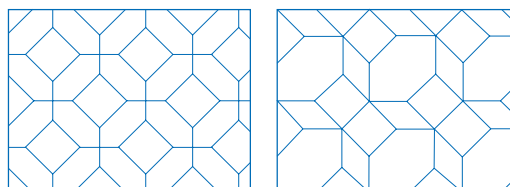
As outcomes, Year 9 pupils should, for example:

Use vocabulary from previous years and extend to: similar, similarity... hypotenuse, Pythagoras' theorem...

Visualise and sketch 2-D shapes or draw them using **dynamic geometry software** as they go through a sequence of changes. Describe what happens and use the properties of shapes to explain why.

For example:

- Imagine starting with an equilateral triangle with one side horizontal – call it the base. Imagine this base is fixed. The opposite vertex of the triangle moves slowly in a straight line, perpendicular to the base. What happens to the triangle? Now imagine that the opposite vertex moves parallel to the base. What happens? Can you get a right-angled triangle, or an obtuse-angled triangle?
- Imagine a square sheet of paper. Imagine making a straight cut symmetrically across one corner. What shape is left? Imagine making a series of straight cuts, always parallel to the first cut. Describe what happens to the original square.
- Imagine two sheets of acetate, each marked with a set of parallel lines, spaced 2 cm apart. Imagine one sheet placed on top of the other, so that the two sets of lines are perpendicular. What shapes do you see? What happens to the pattern as the top sheet slowly rotates about a fixed point (the intersection of two lines)? What if the lines were 1 cm apart on one sheet and 2cm apart on the other?
- Overlay tessellations in various ways, such as octagons and squares on octagons and squares. Describe the outcomes.



Explore how regular polygons which do not tessellate (e.g. nonagons) can be used to cover the plane by leaving holes in a regular pattern. Describe the outcomes.