As outcomes, Year 8 pupils should, for example:	As outcomes, Year 9 pupils should, for example:

Find simple loci, both by reasoning and by using ICT to produce shapes and paths.

Describe familiar routes. For example:

*   Rajshree walked to the youth club.
    She turned left out of her front gate.
    She turned right at the telephone box.
    She went straight on at the crossroads.
    At the traffic lights she turned right then left.
    She turned left at the station.
    The youth club is on the left-hand side of the road.

    Describe her route home from the youth club.

Give practical examples of paths such as:
*   the trail left on the ground by a snail;
*   the vapour trail of an aircraft;
*   the path traced out by a conker on a string;
*   the path of a ball thrown into the air;
*   the path you follow on a fairground ride;
*   the path of the tip of a windscreen wiper.

Visualise a simple path. For example:

*   Imagine a robot moving so that it is always the same distance from a fixed point. Describe the shape of the path that the robot makes.
    (A circle.)

*   Imagine two trees. Imagine walking so that you are always an equal distance from each tree. Describe the shape of the path you would walk.
    (The perpendicular bisector of the line segment joining the two trees.)

Understand locus as a set of points that satisfy a given set of conditions or constraints. Place counters on a table according to a given rule and determine the locus of their centres. For example:

*   Place a red counter in the middle of the table. Place white counters so that their centres are all the same distance from the centre of the red counter. (Centres lie on a circle.)

*   Place a red counter and a green counter some distance apart from each other. Place white counters so that their centres are always an equal distance from the centres of the red and green counters.
    (Centres lie on the perpendicular bisector of RG.)

*   Place white counters so that their centres are the same distance from two adjacent edges of the table. (Centres lie on the bisector of the angle at the corner of the table.)
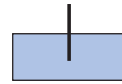
Link to construction (pages 220–3).

Find loci, both by reasoning and by using ICT to produce shapes and paths.
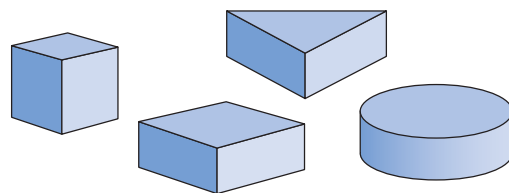
Visualise paths and loci in two or three dimensions. For example:

*   Imagine the black line is a stick stuck flat to a rectangular card so that it lies in the same plane.
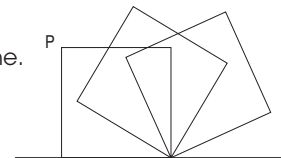

    Hold the card and stick upright and spin it as fast as you can.
    Which of these shapes would you seem to see?

*   Imagine a square being rolled along a straight line. What path would the point P trace?

*   A spider is dangling motionless on a single web. I move a finger so that its tip is always 10 cm from the spider. What is the locus of my finger tip?
    (The surface of a sphere.)

*   I hold a ruler in my left hand, then move the tip of my right forefinger so that it is always 8 cm from the ruler. What is the locus of my fingertip?
    (The surface of a cylinder with a hemisphere on each end.)