## Inscribed Polygons

Use your compass to draw several circles of the same size, for example, with radius 8 cm, on separate sheets of paper. In each circle inscribe a regular polygon. Start with an equilateral triangle, then a square, and work your way up to a regular hexagon, or octagon, or beyond! For each drawing, give the radius, diameter, circumference and area of the circle, and the side length, angle between the sides, perimeter, and area of the polygon. You may need help from a teacher to calculate some areas! Then put all your results into a chart, and note any conclusions you can draw.

If you want to go further, there are several things you can try. Given a certain exact radius, can you use the Pythagorean Theorem to get exact side lengths (not just measured lengths) for the sides of some of the polygons? (For example, the square.) Can you draw the diagonals and measure their lengths too? If you draw all the diagonals, can you count how many regions your drawing divides the circle into? (For example, the equilateral triangle divides the circle into four regions, and the square with its diagonals divides the circle into eight regions.) Is there a formula for the number of regions you get?

Have a lot of fun!