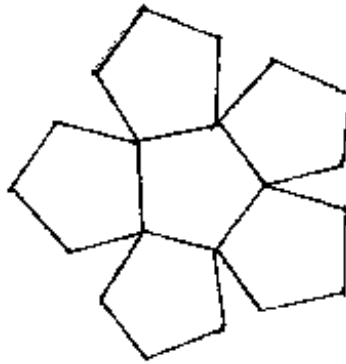# *Plenty of Pentagons*

Since ancient times, the pentagon has been ascribed with mystical meaning and significance. In this exercise you will be asked to construct and explore pentagons, and to make some conjectures about this shape.
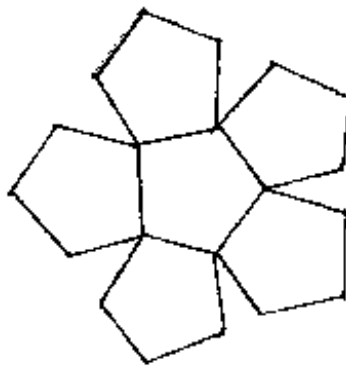
1. In your own words, give a definition for a regular pentagon.

2. Using elements from this definition, describe and demonstrate how you might accurately construct a regular pentagon using a ruler, protractor and compass.
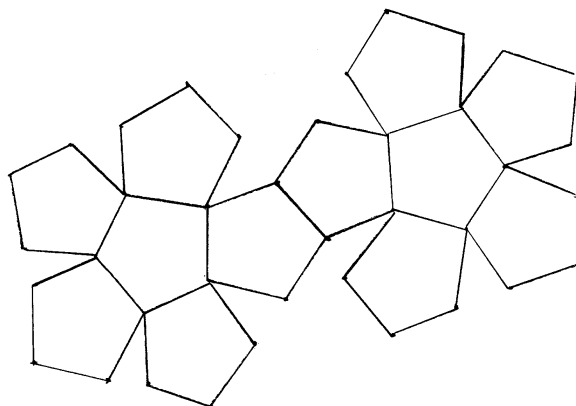
3. Below is a net formed by constructing regular pentagons on each side of the original.
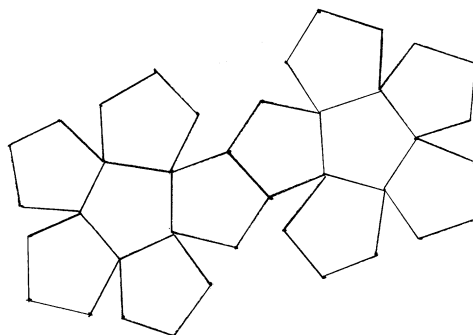

    a. Imagine cutting this out, folding it inward along all common sides, and taping it together along adjacent sides. What would the resulting three-dimensional figure look like?

    b. Suppose you wanted to paint this figure. What do you think is the *fewest* number of colors needed, if no adjoining faces can share the same color?

    c. Label or shade the net to show one way these colors could be arranged.

4. Here is a representation of the web formed by putting two of these figures together.

    a. Now what is the fewest number of colors you would need if, as before, no two adjacent faces can share the same color?

    b. Label or shade the web to show how these colors could be arranged.

    c. Can you think of another way to arrange the same number of colors in order to accomplish the same purpose?