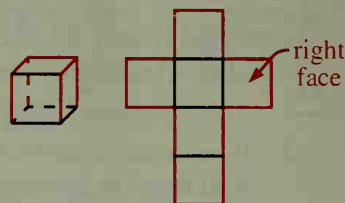


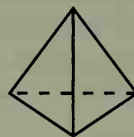
Regular Polyhedra (Chapter 12)

Materials: Ruler, protractor, construction paper, scissors, tape

A regular polyhedron is a solid figure whose faces are congruent regular polygons, with the same number of polygons joined at each vertex (or corner). One example of a regular polyhedron is a cube. If the cube shown at the right is cut along each red edge, it will unfold into the two-dimensional cross shape shown next to it.



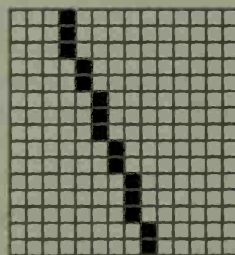
1. Copy the diagram of the unfolded cube and label the other faces: top, bottom, front, back, and left. Then draw the cross-shaped figure on a piece of construction paper, cut it out, and fold it into a cube. Tape the edges together.
2. A regular *tetrahedron*, as shown at the right, is made of four equilateral triangles. Copy the tetrahedron and mark the edges you would cut to unfold it. Sketch what it will look like unfolded. Check your sketch by making a tetrahedron out of a piece of construction paper.
3. In a book, find pictures of the three other regular polyhedra: the *octahedron* (8 equilateral triangles), the *icosahedron* (20 equilateral triangles), and the *dodecahedron* (12 pentagons). Repeat Exercise 2 for the octahedron.



Pixel Lines (Chapter 13)

Materials: Graph paper with a fine grid (at least 16 squares per inch)

A computer screen is made up of small squares called *pixels*, which are used to display all graphics and text. The pixels are arranged in a rectangular grid. If you were to magnify a “line” displayed on a computer screen, you would see that it is actually a jagged collection of pixels, rather than a smooth, straight line. Computers use the three rules given below to create a jagged approximation of a line that looks as smooth as possible.



- (1) Every pixel on a line, except for the first and last, touches *exactly two* other pixels on the line, either vertically, horizontally, or diagonally.
- (2) A line is made by repeating a pattern of horizontal or vertical “runs” of pixels.
- (3) The number of pixels in the different “runs” used in one copy of the pattern must be as close to equal as possible.



Notice that the pixel line shown in the example above meets condition (1), but that the two examples shown at the left do not meet condition (1).