Geometrical Vocabulary

When naming various two– and three–dimensional shapes, it's important to use the right name! Here are some common numerical prefixes:

Number	Greek prefix	Number	Greek prefix
4	tetra–	10	deca–
5	penta–	11	hendeca–
6	hexa–	12	dodeca–
7	hepta–	13	triskaideca–
8	octa–	14	tetrakaideca–
9	ennea–	15	pentakaideca–

Polygon: from the Greek for "many angles."

Polyhedron: from the Greek for "many faces."

Pyramid: Base is a regular polygon, with lateral faces as triangles, as in a "square pyramid."

Dipyramid: Two pyramids stuck base–to–base, so that the bases are no longer seen; only the two sets of lateral faces are visible.

Prism: Top and bottom faces are regular polygons, with squares as lateral faces, as in a "pentagonal prism."

Antiprism: Top and bottom faces are regular polygons, with triangles (in two oppositely oriented sets) as lateral faces, as in a "pentagonal antiprism." You should build one to see that they look like!

Compound: A polyhedron which can be decomposed into two smaller ones, such as a "compound of a cube and a square pyramid."

Vertex: Corner of a polygon or polyhedron. The plural is "vertices."

Convex: No vertices point "in," they all point "out."

Deltahedron: A convex polyhedron made entirely out of equilateral triangles.

Platonic Solid: A convex polyhedron made entirely out of the same kind of regular polygon, with the same number of polygons meeting at each vertex.

Discovering Euler's Formula

Polyhedron	V	E	F	$V + F$	Deficiency

For each polyhedron, count the number of vertices, edges, and faces on the polyhedron, and enter these numbers in the chart above. Then calculate $V + F$ for each polyhedron. What can you discover?

At each vertex, the sum of the angles meeting at that vertex must total less than 360°. The difference between the angle sum at a vertex and 360° is called the *angular deficiency* at that vertex. For each polyhedron, calculate the sum of the angular deficiencies of *all* the vertices on the polyhedron. What can you discover? This result is called *Descartes' Rule of Deficiency.*