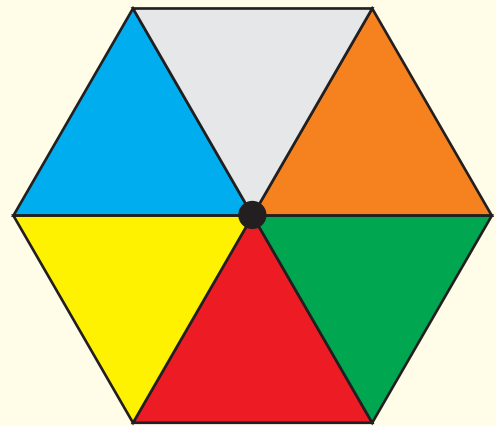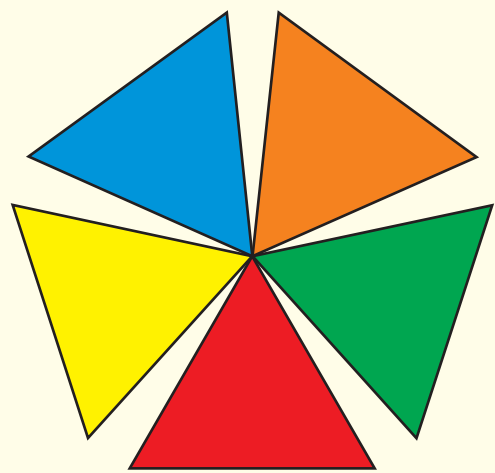# PLATONIC SOLIDS

E - number of edges
V - number of vertices
F - number of faces
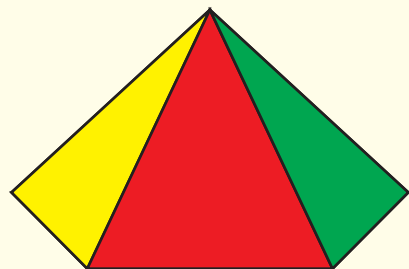
Platonic Solids are solids whose faces are congruent regular polygons. The same number of faces meet at each vertex of the Platonic Solid.
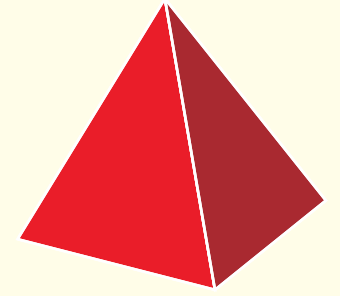
TETRAHEDRON
E=6, V=4, F=4

The sum of the angles at the centre is 360°. So the centre lies flat on the ground.

CUBE
E=12, V=8, F=6

OCTAHEDRON
E=12, V=6, F=8
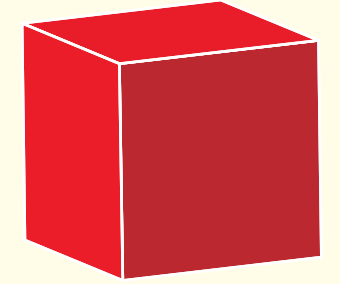
The sum of the angles at the centre is less than 360°. So the corner of a solid can be formed.
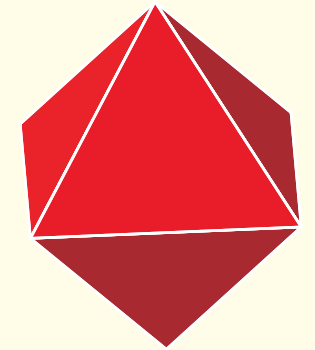
DODECAHEDRON
E=30, V=20, F=12
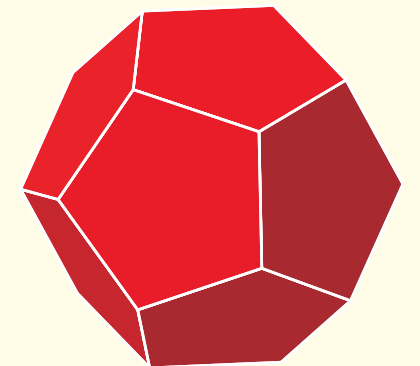
ICOSAHEDRON
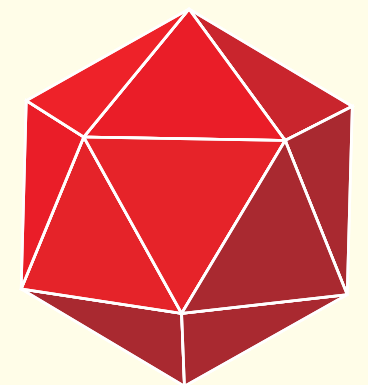E=30, V=12, F=20

The sum of the plane angles meeting at a vertex should be less than 360° to form a solid. This implies that only five Platonic Solids are possible, as the table below shows.

No. of faces meeting at a vertex / Type of face	3	4	5	6	7
Equilateral triangle N = 3 Angle = 60°	sum = 180° (Tetrahedron)	sum = 240° (Octahedron)	sum = 300° (Icosahedron)	sum = 360°	sum = 420°
Square N = 4 Angle = 90°	sum = 270° (Cube)	sum = 360°	sum = 450°	sum = 540°	sum = 630°
Pentagon N = 5 Angle = 108°	sum = 324° (Dodecahedron)	sum = 432°	sum = 540°	sum = 648°	sum = 756°
Hexagon N = 6 Angle = 120°	sum = 360°	sum = 480°	sum = 600°	sum = 720°	sum = 840°