

HISTORY

Tetrahedron – a triangle-based pyramid (as it's often known) has 4 triangular sides and 'tetra' is the prefix meaning 4 in Greek.

Cube (Hexahedron) – cube is the common name, but the prefix 'hexa' means 6 in Greek and the cube has 6 square sides.

Octahedron – the prefix 'octa' means 8 in Greek and much like the octagon has 8 sides, the octahedron has 8 faces, each one an equilateral triangle.

Dodecahedron – a little trickier, but the prefix 'deca' means 10 in Greek, like the 10-sided decagon, whilst 'dodeca' gives you $10 + 2 = 12$ sides of a dodecahedron. Each side is a regular pentagon.

Icosahedron – perhaps the hardest, but it follows the same pattern as all of the other shapes. The prefix 'icosa' means 20 in Greek and an icosahedron has 20 triangular faces, making it the third Platonic Solid to be built from triangles.

ELEMENTS

Fire – Plato described the heat of fire as sharp and stabbing like a little tetrahedron.

Air – the miniature components of the octahedron are so smooth that you can barely feel it, much like air.

Water – it flows out of your hand as if it is made of little balls or icosahedrons, the most rounded of the Platonic Solids.

Earth – it is compact and strong but crumbles and breaks into little cube-like pieces when you pick it up, as the opposite to the flowing motion of water.

Heavens – the dodecahedron was used in Plato's words 'to arrange the constellations on the whole heaven'. It may also have had something to do with the 12 faces of the dodecahedron matching the 12 Gods of Olympus, but this was not the reason given by Plato.

PLANETS

Mercury – the closest planet to the Sun and as a result the small octahedron is used by Kepler as the starting point for his model of the Solar System.

Venus – close to both Mercury and Earth it is enclosed in the most spherical of the Platonic Solids, the icosahedron.

Earth – much closer to Mars than the remaining two planets (Jupiter and Saturn) are to one another and so the most spherical of the remaining shapes, the dodecahedron, is used to represent Earth in Kepler's model.

Mars – there is a large gap between Mars and the next planet Jupiter which Kepler chose to represent by the tetrahedron.

Jupiter – the last remaining solid, the cube, represents the distance between Jupiter and the Spherical orbit of Saturn.

NATURE

Methane – the chemical formula of methane is CH_4 with 4 hydrogen atoms equally spaced around a central carbon atom. A tetrahedron shape means that the hydrogen atoms are as far away from one another as possible.

Salt – formed of crystals of Sodium Chloride (NaCl) which are arranged in a cube-shaped lattice. The cube shape is clearly visible in natural salt mines.

Diamond – the hardest natural substance on Earth, in part due to the octahedral structure of the carbon atoms providing great strength to the crystal.

Virus – an icosahedron is the easiest shape to construct from the shape of the base proteins that make up many of the most infectious viruses.

Universe – French Astrophysicist Jean-Pierre Luminet put forward the hypothesis that the universe is shaped like a dodecahedron in 2003. We may never discover whether he is right...

MAN-MADE

Weather Vane – a tetrahedron with two sides covered in a thin material and mounted on a rotating pivot is used on many airfields to indicate the wind direction to approaching pilots.

Food – many foodstuffs such as ice and sugar come in the form of a cube. It makes them easy to pack together and helps to slow down the rate at which they dissolve in a drink by reducing the surface area.

Camera – the Dodeca 2360 made by Immersive Media is the world's first 360° camera that is able to capture high-resolution video from every direction at the same time and is based on the shape of a dodecahedron.

Engineering Space Frame – one of Buckminster Fuller's many inventions, the space frame uses the strength of a repeating octahedron-shaped section to greatly increase the amount of stress that a structure can withstand.

World Map Projection – Buckminster Fuller and Japanese cartographer Shoji Sadao designed a map of the world in the shape of an unfolded icosahedron, which had a maximum distortion of only 2%.