Data structure:

In order to store such an interesting and irregular shape with curves, bumps , aliasing, smoothing, the computer uses a file format called “.stl”. This is similar to “.txt” or “.mp3” or “.jpg”.

The shape is stored using two arrays called meshes. The first array is a bunch of vertices, it is essentially a 'n' by 3 array, 'n' being the number of vertices the dodecahedron has. This array stores the vertices by simply storing the x-y-z coordinates of each vertex in each row. The index of each row would then be the ID number of the vertex it is corresponding to.

On the second mesh, the file is a 'k' by 3 array. Each row of this mesh represents a triangle, 'k' being the number of triangles the dodecahedron has. Each row has 3 positive integers which represents the ID numbers of 3 specific vertices, and the 3 vertices are then linked together to form a triangle. In this mesh, vertices are often used more than once in different triangles, in fact it is specifically through this that the triangles are linked together hand in hand, without a "leak", to form a larger surface an eventually loop around and enclose a volume to form a polyline!

The end result of the products are modified automatically by linking the points with "wires" to form triangles, covering the triangles with a sheet, and filling the inside enclosed volume with material such that it has structure when 3D printing can and looks nice on a computer screen. However, to understand the data structure, it is important to see the object on its most original form: