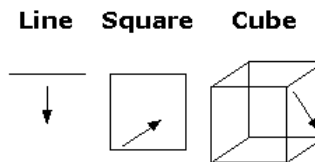


## Answer on Question #53279, Engineering / 3D CAD Modeling (AutoCAD, ArchiCAD, SolidWorks, Ansys, Catia)

Can you please explain, what is 1D, 2D and 3D with examples each?

**Answer:**



### 1-Dimensional

1-dimensional items can be most easily related to a line.

Picture an x axis. The x-axis which is a line, is one dimensional.

If you were to draw one line in any direction on a sheet of paper, that would be a 1 dimensional line.

### 2-Dimensional

2-dimensional object consist of more than one line that exist on a plane. They have measurable dimensions when placed on an x-y axis. It must have no thickness to it. If you were to draw a rectangle, a circle, a triangle, or any other shape on a sheet of paper, this would be two dimensional.

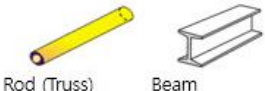




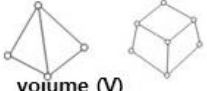
The two dimensions depicted are length and width and the objects on the picture are flat. Examples of such pictures are ancient Egyptian wall paintings.

### 3-Dimensional

Three-dimensional pictures contain yet another dimension: depth.

There is also a z-axis. If you were to draw an x-y axis with the x running horizontally, the y running vertically perpendicular to the x-axis, the z-axis when represented on paper runs through the middle of the intersection of the x-y axis.

When drawn on paper, this is a 2D representation of the three dimensions. For example, when you draw a cube on a sheet of paper, this is still 2D, but it is a 3D representation, unlike a drawing of a square. 3D movies are labeled as 3-dimensional, but they are really just a 3D representation of a 2D object.

Type	Actual Models	Finite Element Expressions (Geometric Properties Defined by Nodes)
1D	 Rod (Truss)      Beam	 Length (L)
2D	 Shell, Plane Stress, Plane Strain, <u>Axisymmetric</u> , etc	 Area (A)
3D	 Solid	 volume (V)