

# Block

## 1 Block concept

What does a block look like? In 2D space, the building brick( or fundamental element) is 2D point, points can make up as a line, then lines can make up as a polygon. In 3D space, the fundamental element seems again to be 3D point. But since in 3D space we are interested in something that has some “volume”, then we can abandon using 3D point as the fundamental element. If considering something has some volume but the same time be the fundamental brick, then a block is the most appropriate one.

A block can be in any size. For a real world 3D object, many different-size blocks can approximate it very well if not to say perfectly.

So, what does a block look like or how to describe a block? A block is indeed a very simple thing, we can use a square base and a height to describe it, in this case, we just need to describe the origin of the bottom left point of the base, then the cell size of the base, then the height, that's all.

In our project, these properties are not enough. Since our block is interpolated from other things, we should add some info to describe info coming along with the interpolation. Using the linear interpolation as an example, we do the linear interpolation by dividing grid's height interval to several equal parts, so the height of a block is indeed the height of one part times the the number of parts. And on the other side, our block doesn't record the origin of the square base directly (the grid record this), instead, our block should keep track of the rows and columns of it in the grid, in this way, it is easy for us to calculate the block's origin if necessary. We should have some mechanism to record all of this extra info.