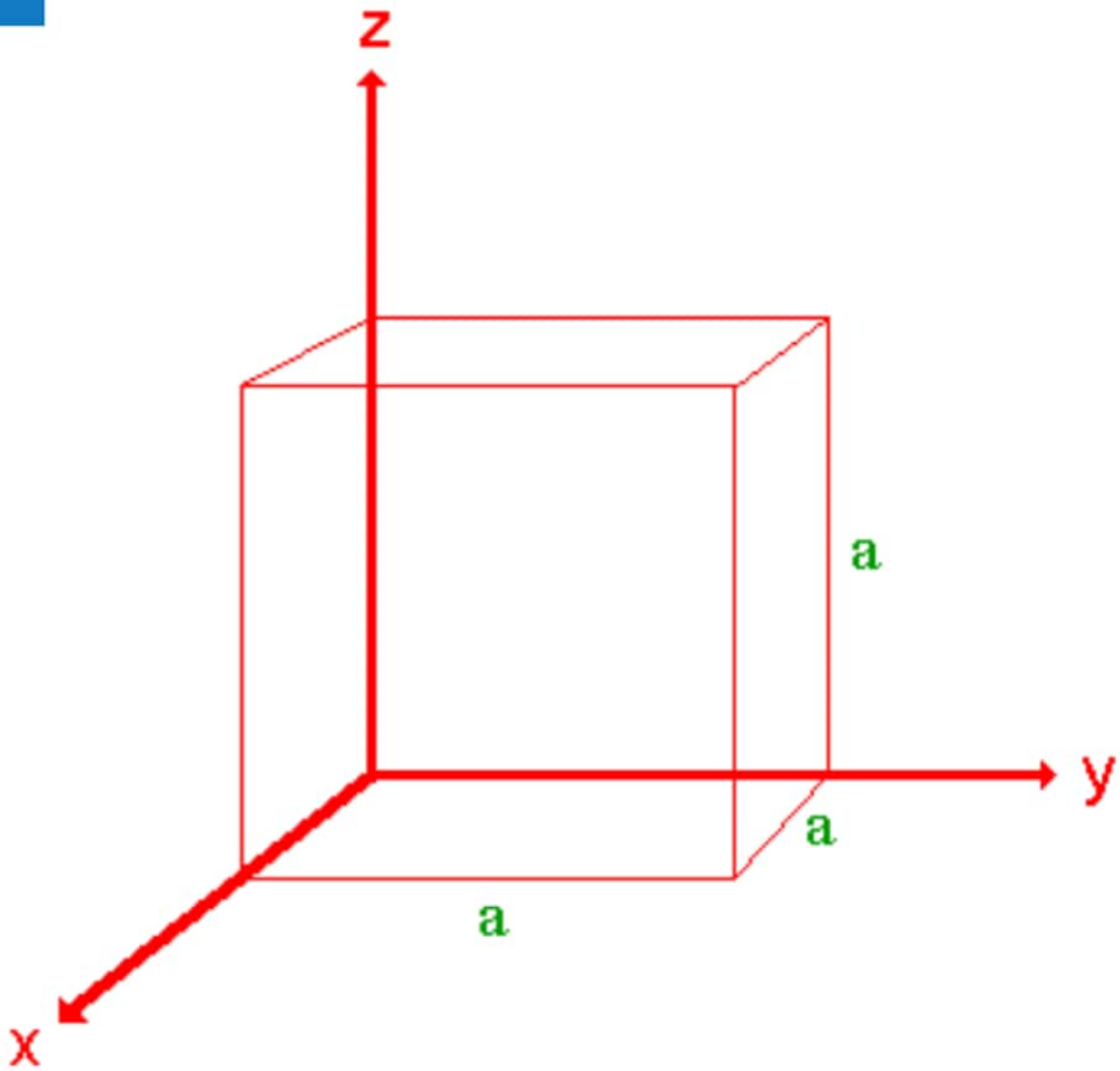
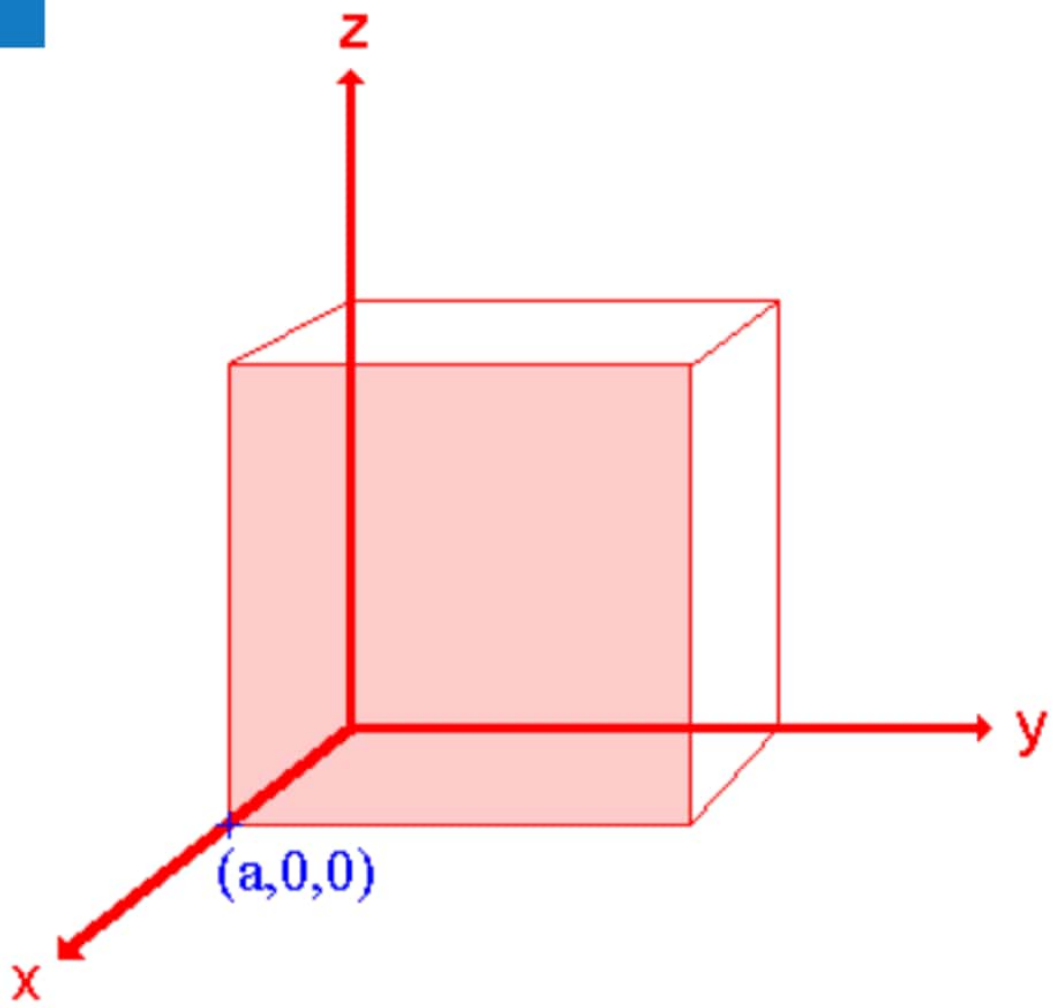
The orientation of a surface or a crystal plane may be defined by considering how the plane (or indeed any parallel plane) intersects the main crystallographic axes of the solid. The application of a set of rules leads to the assignment of the Miller Indices (*hkl*), which are a set of numbers which quantify the intercepts and thus may be used to uniquely identify the plane or surface.

The following treatment of the procedure used to assign the Miller Indices is a simplified one (it may be best if you simply regard it as a "recipe") and only a **cubic** crystal system (one having a cubic unit cell with dimensions *a* x *a* x *a*) will be considered.



The procedure is most easily illustrated using an example so we will first consider the following surface/plane:



Step 1: *Identify the intercepts on the x- , y- and z-axes.*

In this case the intercept on the x-axis is at $x = a$ (at the point $(a,0,0)$), but the surface is parallel to the *y*- and *z*-axes - strictly therefore there is no intercept on these two axes but we shall consider the intercept to be at infinity (∞) for the special case where the plane is parallel to an axis. The intercepts on the *x*- , *y*- and *z*-axes are thus