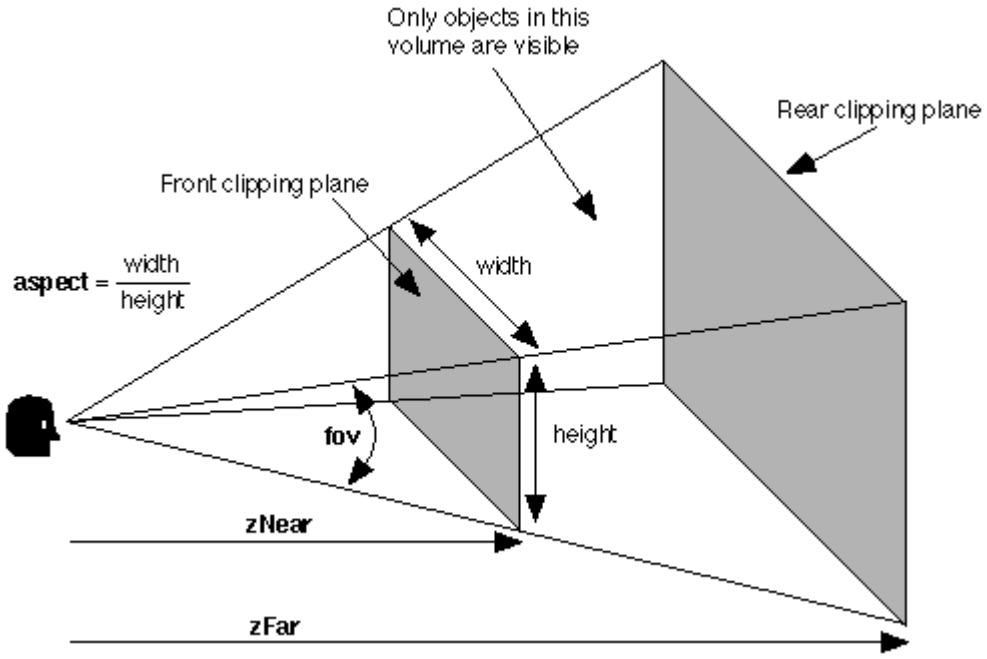
The zoom (using the mouse wheel) and pan tools are implemented by modifying the default ortho projection. If you add your own projection to the display list, the zoom tool is disabled.

Perspective

The perspective projection simulates the way your eye sees 3D objects. Although this is a realistic projection, it does not preserve the exact orientations or shapes of objects; for example, parallel lines may diverge or converge and there is foreshortening of objects. The viewing area is in the shape of a truncated pyramid in which the top has been cut off parallel to the base. Only objects within the viewing volume are visible. This is a symmetric perspective view of the viewing volume; a frustum, discussed in the next section, supports an asymmetric volume.

As shown in this diagram, the perspective projection depends on 4 parameters: fov, aspect, zNear and zFar.



Frustum

The frustum projection is essentially the same as the perspective projection, but in this case it has more flexible settings, which means that it does not have to be symmetrical or aligned with the Z axis.

As shown in this diagram, the frustrum projection depends on 6 parameters: left, right, bottom, top, zNear and zFar.