OpenGL - Model, View and Projection

Model

Basically, a model is the 3D graphical object that need to be simulated.

Model can be a point, or a set of points that creates a thing.

In OpenGL :

- To move an object, we can use glTranslate
- To rotate an object, we can use glRotate

glTraslate and glRotate will change the model matrix to translate and rotate things.

More information: Transformation Matrix en-us vi-vn

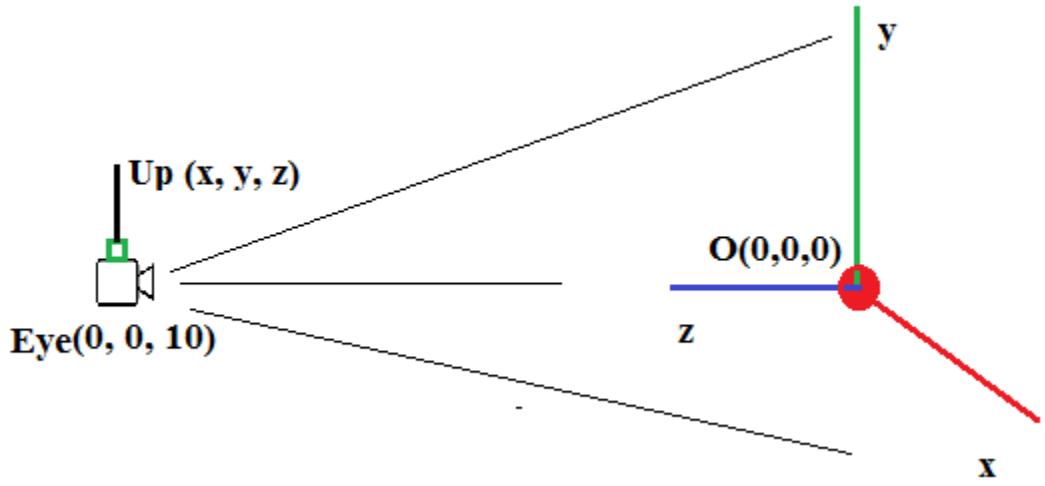
View

As our eyes, to look at an object, we need a camera in OpenGL, that is View

Agruments: [Position] [Point on Object] and [Direction]

```
glLookAt(eye_x, eye_y, eye_z, model_x, model_y, model_z, up_x, up_y, up_z);
```

Example: `gluLookAt(0.0, 0.0, 10.0, 0.0, 0.0, 0.0, 0.0, 1.0, 0.0);`

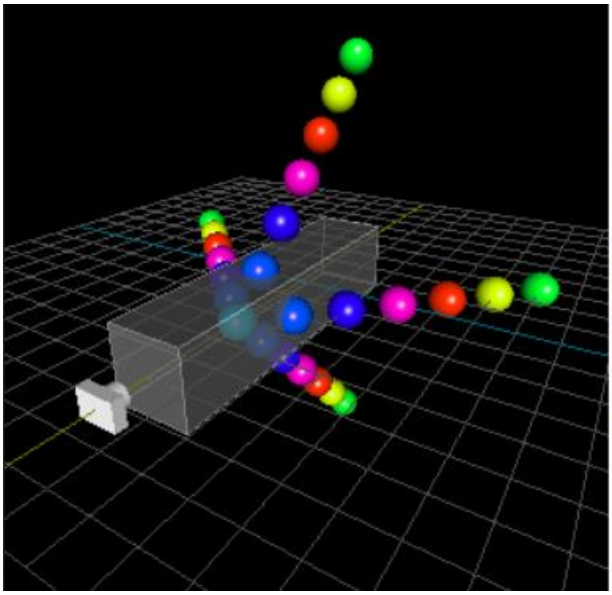


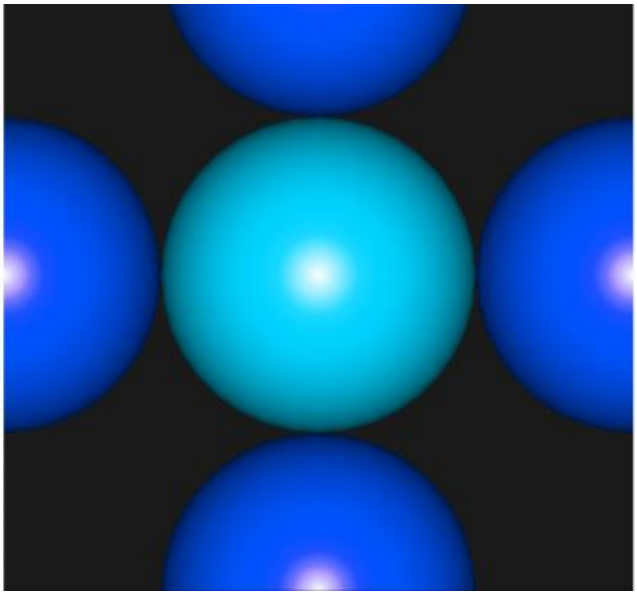
Projection

Orthogonal Projection

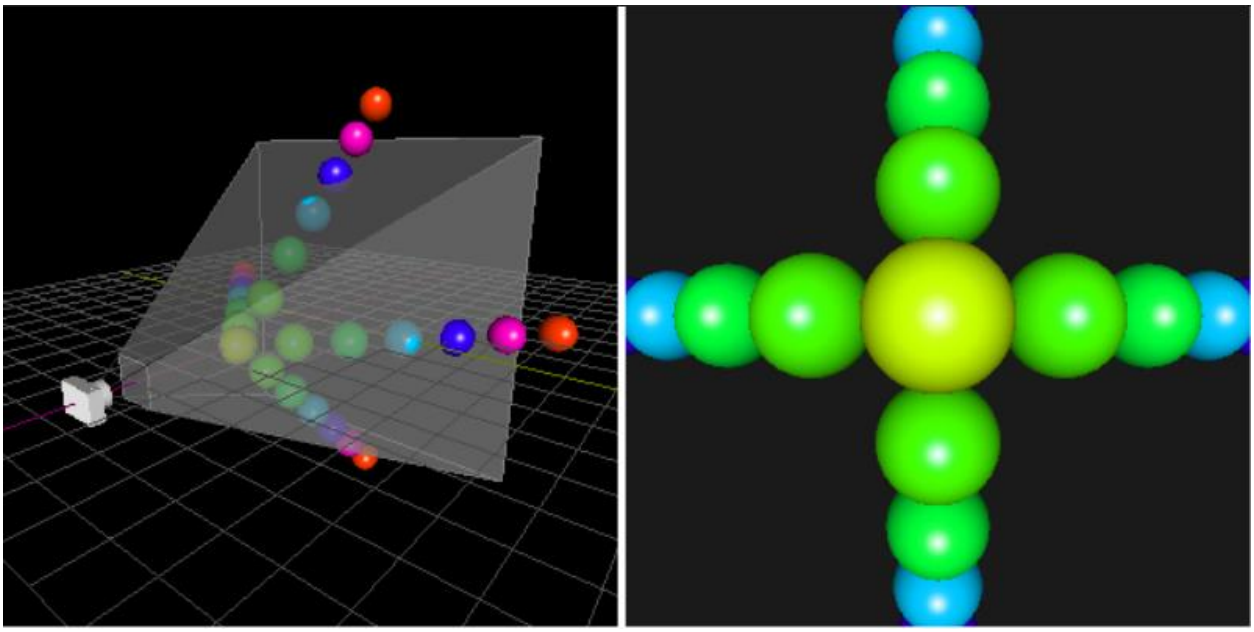
We will see the size of the object is not change despite the distance between Camera and Object changing.

Projection area: a box with 6 dimensions: [Left – Right] [Bottom – Top] [Near- Far]

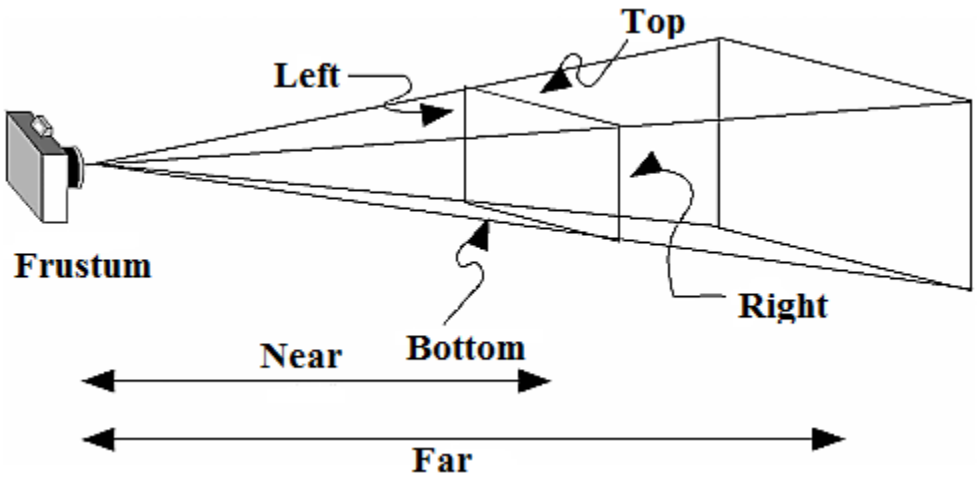




Perspective projection

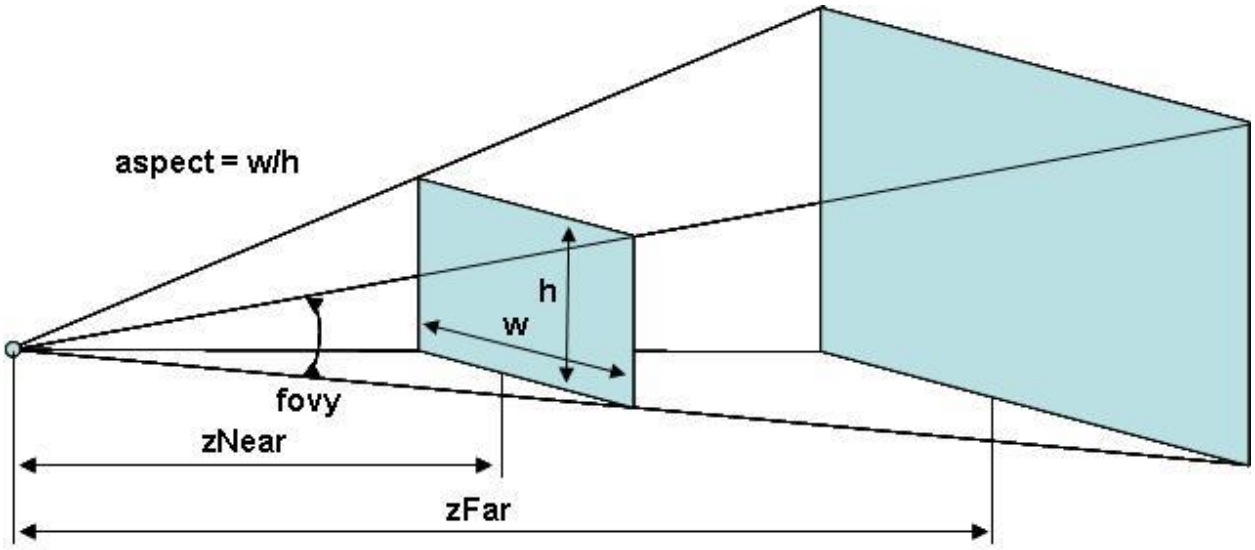


In Open GL :




```
glMatrixMode(GL_PROJECTION);
glLoadIdentity();
glFrustum(Left, Right, Bottom, Top, Near, Far);
```

or




```
GLfloat aspect = (GLfloat)width / (GLfloat)height;
glMatrixMode(GL_PROJECT)
glLoadIdentity();
gluPerspective(fovy, aspect, zNear, zFar);
```