

# Project Manual

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Week 5

This project is web-based. No additional software installation is required. However, your web browser must support WebGL.

## I. Creating Objects

To draw an object, simply select the object you wish to draw from the dropdown menu underneath the “Draw an Object” heading. Any parameters that are required can be specified underneath the dropdown menu. Once the parameters are specified (if necessary for that particular object), simply click the draw button to draw the object on the canvas. For objects to be visible on the canvas, dimensions should be specified with values between 1 and 20. You can draw multiple objects on the same canvas.

When drawing a “custom shape”, it is important that the coordinates given start and end with (0, 0). When you select that option in the program, an example is provided in the text area.

## II. Viewing Objects

My project allows the objects draw to be viewed from four different cameras. The view can be adjusted to show all four camera views at once, or only one view. ***Please note that an object may be visible in one camera, but not another depending on its position and size.*** All camera movement functionality is available underneath the “Change the View” subheading.

### A. Changing the number of cameras

To toggle the number of camera views displayed on the screen simultaneously, simply select the “One Camera View” or “Four Camera View” button. You may toggle between the views without losing any objects on the canvas.

## B. Move and Zoom

To move, rotate, or adjust the zoom of the camera, use the “+” and “-” buttons provided for each function. You can also rotate by clicking and dragging your mouse on the canvas. To zoom using the mouse, use the mouse’s scroll wheel.

## III. Editing Objects

All editing options are available underneath the “Edit an Object” subheading. Before editing any object, it must be selected by choosing it from the dropdown menu directly underneath the “Edit an Object” subheading. This dropdown will display all objects that are currently on the canvas.

### A. Rotating objects

Objects can be rotated using the controls provided underneath the “Rotate the Object” subheading. Objects can be rotated about the X, Y or Z axis. The “+” and “-” buttons for each axis will rotate the object in opposite directions.

### B. Translating Objects

Objects can be translated using the controls provided underneath the “Translate the Object” subheading. Objects can be translated along the X, Y or Z axis. The “+” and “-” buttons for each axis will translate the object in opposite directions.

### C. Shearing Objects

Objects can be sheared using the controls provided underneath the “Shear the Object” subheading. Objects can be sheared about the X, Y or Z axis. The “+” and “-” buttons for each axis will shear the object in opposite directions. As the object is sheared, you will see that the scale of the object is updated automatically.

### D. Scaling Objects

Objects can be scaled by entering numerical scales underneath the “Scale the Object” subheading. The default scale is 1. A value of 2 would double the size of the object, 3 would triple it, etc. A decimal can also be specified. For example, 0.5 would display the object at half size. An X, Y and Z scale can be provided.

After you enter the scale factors, press the “Apply Scale” button to update the object on the canvas.

#### E. [Animating Objects](#)

To animate objects (rotate them about a particular axis automatically), simply press the corresponding “Toggle Rotation” button. To turn off the rotation, simply press the button again.

#### F. [Creating Object Groups](#)

To create a group of objects, click the “Create object group” link. This will trigger a popup window to open. Select multiple objects from the select list (CTRL + Click on Windows and ⌘ + Click on Mac) and enter a nickname to move them into a combined group. Once objects are moved into a group, they cannot be separated. However, groups can be combined with other groups or objects. Objects in a group are treated as one object and can be transformed together.

#### G. [Deleting Objects](#)

To delete an object, ensure it is selected from the edit dropdown menu, and click the “Clear Selected” button. To clear all objects, click the “Clear All” button. Both these options are under the “Clear the canvas” subheading.

#### H. [Changing Object Color or Texture](#)

The user has the ability to change the color and texture of the selected object. To do so, select the desired color/texture from the dropdown box underneath the “Change color / texture” subheading. Once you have selected the desired option, click the Apply button. ***Color and texture can be applied to all objects but cannot be applied to groups (such as the house object or a user-defined group).***