



TinkerCAD and 3D Printing

3D Printing is the process of making three dimensional solid objects from a digital file. A 3D Printer creates these objects by laying down successive layers of material. The printers at Barrington Area Library use Polylactic Acid (PLA), which is biodegradable plastic.

3D Modeling is the process of creating a 3D representation of a surface or object by manipulating shapes, edges, and vertices in simulated 3D space. Using specialized software, 3D modeling generates files that are essentially instructions for 3D printers.

Today, we will be using TinkerCAD to make a project!



How it works:

- **Moving Objects**
Shapes are basic building blocks of Tinkercad. Shapes can be moved, resized, rotated, raised and lowered.
- **Camera Controls**
Drag the ViewCube to change your point of view. You can also hold right click button while moving your mouse to accomplish the same thing. You can zoom in and out using the scroll wheel on your mouse or the + and - signs under the ViewCube.
- **Creating Holes**
Material can be removed from any shape using the "Hole" tool.
- **Scaling, Copying, and Pasting**
Shapes can be duplicated using "copy" and "paste." Regular keyboard shortcuts work for this. Shapes can be scaled on all three axes (X, Y, and Z).
- **Grouping and Aligning Objects**
Group together a set of shapes to make them into one shape. Sets of shapes can be ungrouped at any time. The alignment tool can help center objects quickly.
- **Using the Workplane**
The given work plane is flat, but we can also position objects vertically using the work plane feature.

Making a House!

1. Drag the red cube to the blue grid, called the workplane.
2. Change the orientation of the workplane using the workplane tool. Click “Workplane”
3. Orient the white square on top of the red cube and click the mouse once. The blue grid should have turned orange. This will allow us to place the roof at the appropriate height, instead of on the ground.
4. Drag the green roof on top of the red cube.
5. Set the orientation of the workplane back to normal. Do this by clicking “Workplane” and clicking anywhere on the orange grid.
6. Align the green roof and red cube so they’re directly on top of each other. Select both objects by drawing a box around them. Once they’re both selected, click the Align tool in the top menu bar. There will be many black circles on all sides of the objects. Click the middle circle on both sides of the cube that are touching the ground. Don’t click the middle circle on the “Z Axis”, or the one that is vertical.
7. Group the objects by clicking the Group tool in the top menu bar. The shortcut to do this is “Control + G”. Both objects will turn red.
8. Next, we will add a chimney. Drag another red cube to the blue grid.
9. Resize the cube to be a skinny rectangle by dragging the white squares on the sides. You can also use the Ruler tool to resize objects easily. A good size would be 5x5x30 mm. Move the resized chimney to the side of the house, as pictured below.
10. Add more details, perhaps a door with knob, or windows.

