TinkerCad:
Welcome to the Wide, Wonderful World of 3D
That You Can Do Yourself!

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Start Here
Our notes are available through a browser:
http://cs.oregonstate.edu/~mjb/tinkercad
The TinkerCad program is available through a browser too:
http://www.tinkercad.com
You can create your own TinkerCad account. The advantage of
this is that TinkerCad will keep your 3D creations in cloud
storage so you can get at it later. If you are under 18 years
old, get your parents’ permission and have them help you.
To use our account, use:
User: mjb@engr.oregonstate.edu
Password: corvallis72542
If you use our account, then we can get to your designs later.

TinkerCad
TinkerCad is a free web-based CAD package from AutoDesk. It is a solid modeler,
so you always have legal 3D objects suitable for 3D Printing. You get to it at:
http://www.tinkercad.com/

Start Tinkering
Thanks to Autodesk for developing
TinkerCad and keeping it free!
**Logging In**

- Email or Username: mjb@engr.oregonstate.edu
- Password: corvallis72542

**First Screen You See**

- Click here to start something new
- Your 3D scene
- More things to build with

- Standard 3D objects to build with

**The First Screen You See**

- Who you are
- Designs this account has worked on before

**Moving the Scene around in 3D**

- If you have a mouse:
  - Rotate - right mouse button
  - Scale - scroll wheel
  - Pan (translate) - middle mouse button

- If you don’t have a mouse:
  - Rotate - touch and move the blue plate, or touch and rotate this cube
  - Scale - pinch on the plate, or touch the + and - buttons
  - Pan (translate) - two-finger touch on the blue plate
Un-do is Your Best Friend Ever!

If you have a keyboard, Control-Z also works.

Start by Dragging an Object into the Scene

With your finger or the left-mouse button, drag a shape into the scene.

The Small Symbols Let You do Things to the Object

- These curved arrows allow you to tilt the object.
- The solid black arrow allows you to lift the object up in the air.
- Touch or left-click in the object to move it left-right and in-out.
- All the white and black dots allow you to change the size of the object in one or more dimensions.
- This curved arrow allows you to rotate the object in the horizontal plane.

Scaled, Lifted, and Tipped

Changing the Color

With the object selected, click here and select a new color.

Combining Objects

Take 2 objects and overlap them.

They might look like they are one object together, but they aren’t. You can tell by the overlapping edge lines.
Select both objects (touch both, or left-click on one and then shift-left-click on the other) … and then click on Group.

Sometimes it is Easiest to Select Multiple things by Just Dragging a Selection Box Around Them.

You can tell they are now one object because you see no overlapping edge lines here, and they are a single color.

If you don’t like the single color-ness, select the Multicolor color. Your objects are still combined.

An even cooler trick — while the objects are overlapped, but before they are grouped, click on just one of them and then click on Hole. This makes that object a “negative object” (I call it a “Ghost Object”).

Now select both objects again, then click on Group like you did before. This causes the Hole object to take a “3D Bite” out of the other object. You can use this to make new shapes or can even create holes through shapes.
Changing the Name of Your Design

When you start a new design, TinkerCad gives it a funny name. This is OK, but please give it a more descriptive name, by clicking on the funny name and type in a new one:

If you want your design 3D Printed, be sure to set the descriptive name to something to do with your real name so we can get the 3D Print to you.

Basic Geometric Shapes

These are the standard built-in objects that you can use

Not Sure Where to Start?

Try One of These

Something Different: Scribbling

With the left-mouse button down, drag the Scribble icon into the scene.

Grab this icon and, well, scribble with it (duh)

Your scribble

Click Done when done
From there on, it acts like any other 3D object. Here someone is subtracting a cylinder from their 3D Scribble.

You can color it. You can group it with other 3D objects.

3D Text!
1. Select and drag Text
2. Type your text in here

Unbeveled vs. Beveled 3D Text
Unbeveled text: STEM is cool!
Beveled text: STEM is cool!

Grouping the Text with a Block to 3D Print a Desk Sign

Grouping the Text with a Block to 3D Print a Desk Sign

Other Stuff
Click here to see the other things you can design with!
Try them!

Shape Generators
A Shape Generator is a way of making different versions of a shape by interacting with a dialog box.

The Fidget Spinner is in here
States and countries are in here

Other Stuff
Click here to see the other things you can design with!
Try them!
The Voronoi Shape Generator is Pretty Fun Too

3D Printing with TinkerCad

3D Printing is defined by some sort of "additive" process. The current frenzy in 3D Printing consists mostly of systems that deposit layers of molten plastic.
Writing Your Design out for a 3D Printer

Select the object and click on Export, which says that you are trying to give your object away.

Most 3D Printers want an STL file as input, so click here and tell TinkerCad where you want this file saved.

The 3D Printing Geometry File

3D Printers are fed a file called an “STL File”, which lists all the triangles in the object. Blender (as well as all other modeling systems) can produce this type of file for you.

Object Rules for 3D Printing

1. The object must be a mesh and consist only of triangles.

Fortunately, TinkerCad does this for you.

Watch Out for Overhangs!

Some 3D printers handle this by leaving unused material in place to support the overhangs.

Some 3D printers handle this by using software to add “support structures” to the overhangs.

Some 3D printers handle this better than others... 😊

http://twistedsifter.com/2013/08/when-3d-printing-goes-wrong/
Object Rules for 3D Printing

3. You can’t make an object by simply overlapping two objects in 3D. If you want both shapes together, do a TinkerCad “Group” on them so that they become one complete object.

So, be sure all parts of your design are Grouped!

What Happens if You Do Overlap Objects?

Here’s what one of the 3D Printers in the OSU Library did:

Not bad – it’s wrong, but it could have been lots worse …

Want to see 3D Printing in Action?

Oregon State University’s library has 3D Printers for use by OSU students. To see them via webcam, go to:  
http://webcam.oregonstate.edu/3dprinter

Click here to see the live, streaming view.

Writing Your Design out for another 3D Modeling Program

Select the object and click on Export, which says that you are trying to give your object away.

Most 3D Modeling programs will accept an OBJ file as input, so click here and tell TinkerCad where you want this file saved.

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