

# Intro to Blender

in digestsible bits *urp!*

## Lesson 2: Cylindrical Objects

Yes, this sounds boring but it doesn't have to be. We're going to build an object that is based on cylindrical geometry.

You remember what a cylinder is, of course. Below there's a reminder in case there are any folks out there who slept through that geometry lesson.

Come up with idea for an object that is based on a cylinder. Here is a list of some objects that will fit the bill. You can use one of these or come up with your own idea. We're going to keep it very simple this lesson.

- soup or paint can
- baseball bat
- UFO
- antenna
- magic wand
- walking stick
- javelin or spear
- cup
- herald's Trumpet
- bottle
- earthworm
- bowling pin
- baton
- ice cream cone
- pylon
- Frisbee
- plate
- bowl



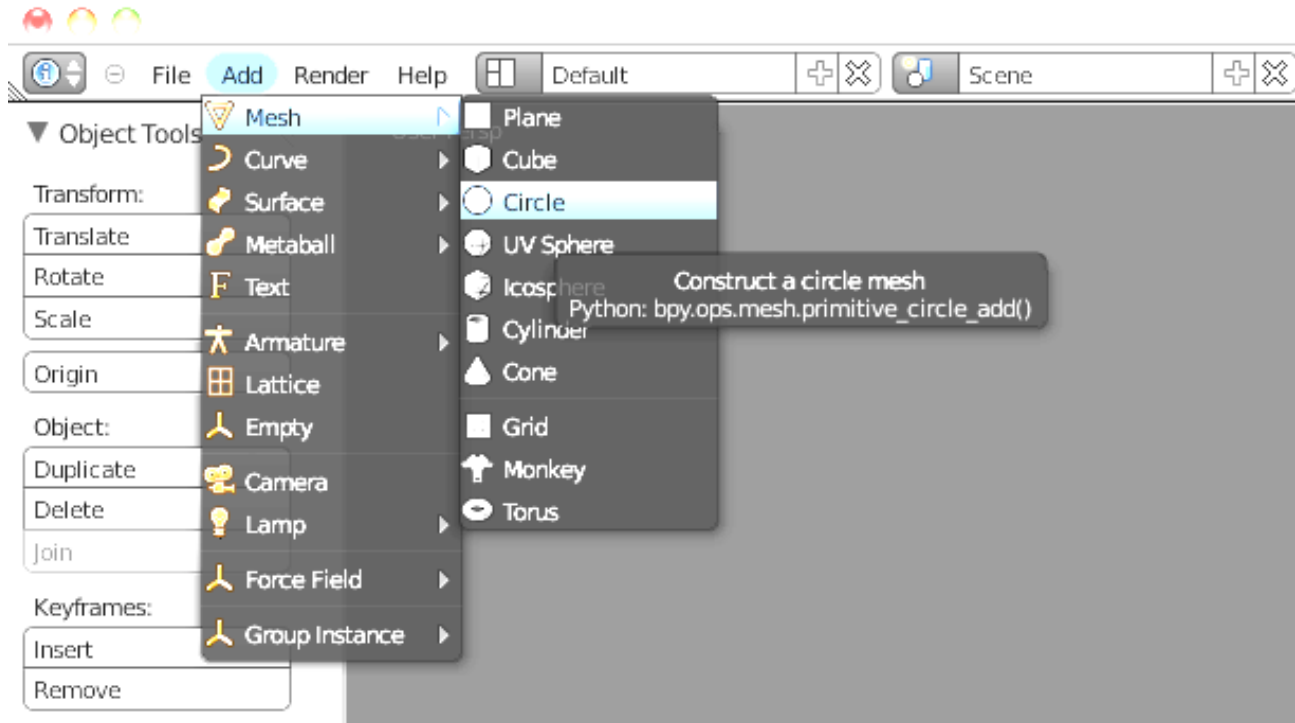
I'd wager you get the idea now. Once you know what object you're going to make, it's ready to move on...

## Getting Started

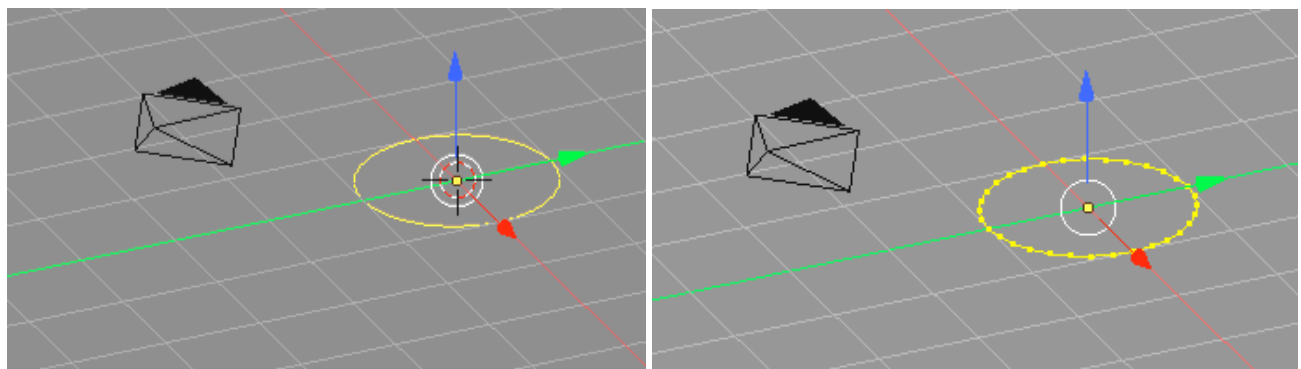
Open up a new blender file. See that default cube? Press **X** and when given the option, **delete** it. If nothing happens when you press **X**, it's because the cube wasn't selected. Right click on the cube so that it's got an orange outline and then press **X**, and **delete**.

Now look at the title bar (that's the top row of functions in the Blender window).

Left click **ADD > MESH > CIRCLE**



A circle will appear in your 3D Viewport (below, left). Press **TAB** to go into Edit mode. You'll see the vertices that make up the circle (below, right).



## Selecting and Extruding

Press **A**, now no vertices are selected. Press **A** again. All of them are. **A** is a very handy shortcut for selecting all and also deselecting all.

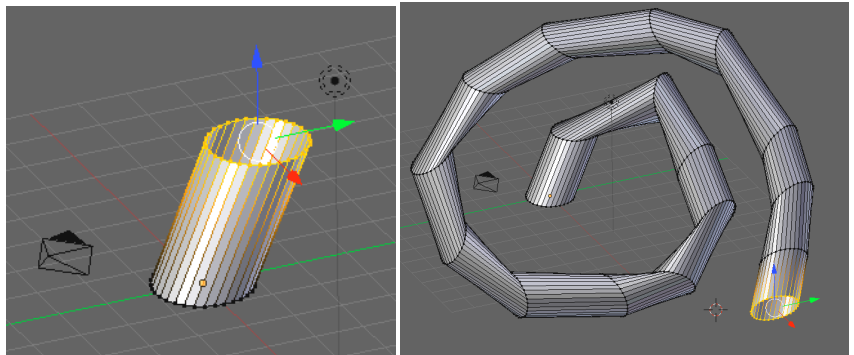
### Free Extruding

There are two ways to extrude. With all of the vertices selected (orange). Move the cursor somewhere else on the viewport- anywhere.

#### Method 1:

Press: **control** + **LC** (left click), an instant free extrusion (right) ! This is handy because you can just hold **control** and click your way to extruded happiness (below).

Press: **control** + **Z** to go back a steps until you get back to your original circle.



#### Method 2:

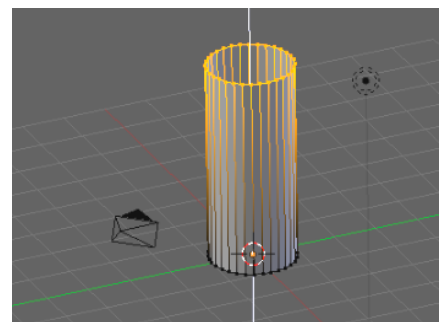
This method is a little more cumbersome but some people like it. With your original circle selected, press **E**, move your mouse and **LC** (left click) when the extrusion is where you like it.

### Constrained Extrusions

All that means is that you pull your extrusion along any one axis, labeled x, y, or z. This is handy if you want a regularly shaped object like a baseball bat.

Blender Axes:

- x-axis is left-right and **Red**
- y-axis is front-back and **Green**.
- z-axis is up and down and **Blue**



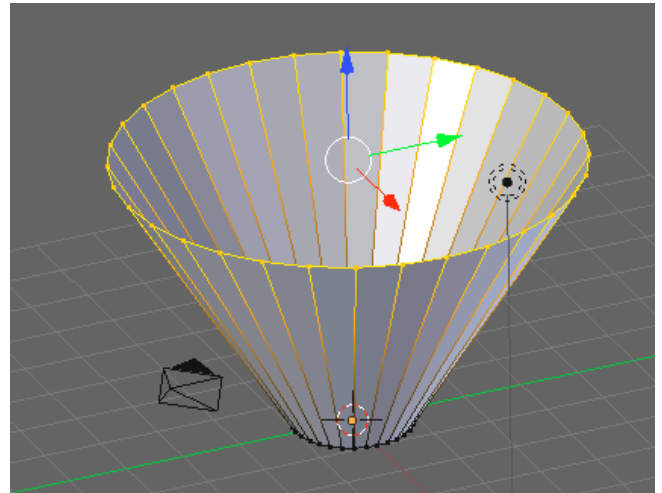
Clear your work until you get back to the original circle again. You can use **control** + **z** to do this, or just close down Blender and open it again, delete the cube and add the circle. When you dropped in the circle, it's laying flat on the x-y plane. Press **1** (front view). It appears as a line. Press **3** (side view), as a line again. Press **7** (top view), there's your circle.

Let's make a simple tube like for paper towels or toilet paper. Click **2**, **4**, **6**, and **8** until you get a nice view of the screen where you can see all three dimensions. With your circle selected, Press **E** and drag your cursor. Now before you **LC** to stop the extrusion, press **Z**. That will constrain the extrusion to the vertical (z) axis. A bright line appears along the constrained axis now. **LC** when you have the extrusion the length that you want.

## Scaling Circles

With one of the ends of your tube selected, press **S**. Now move the cursor towards and away from your selected vertices. **LC** when you are happy with the size of that set of vertices. You can easily make cones this way or add contours to your extrusions.

**Tip:** You can constrain and Grab, Rotate, or Scale action along an axis. Select the vertices that you want to change, press **G**, **S**, or **R**, then **X**, **Y**, or **Z**, and make the changes. The combinations are quite powerful.



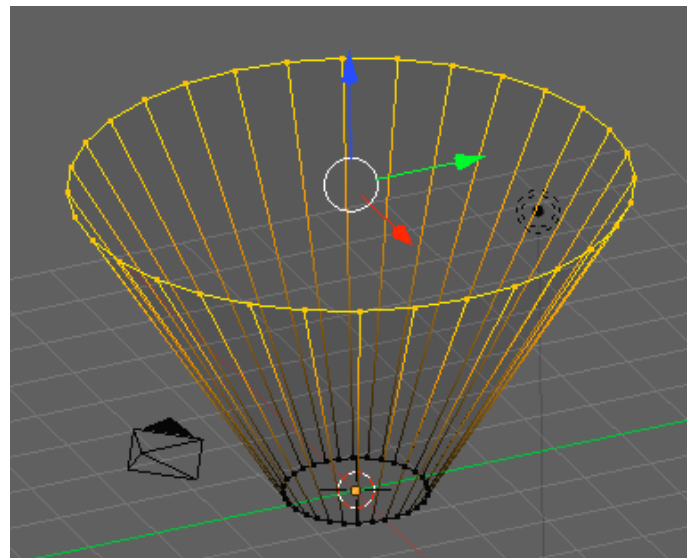
## Making an object

Visualize your object. Where will you need to extrude? Where will you need to scale? Will you want to use a constrained extrusion or free extrusion?

Block in your object using the techniques above. Here are some things that might help with making adjustments.

## Solid vs Wireframe

Toggle **Z** a couple times. You can see through your object if wireframe mode is selected. To the right, the same object and view as above in wireframe mode. This can be useful if you are selecting points that are behind others.

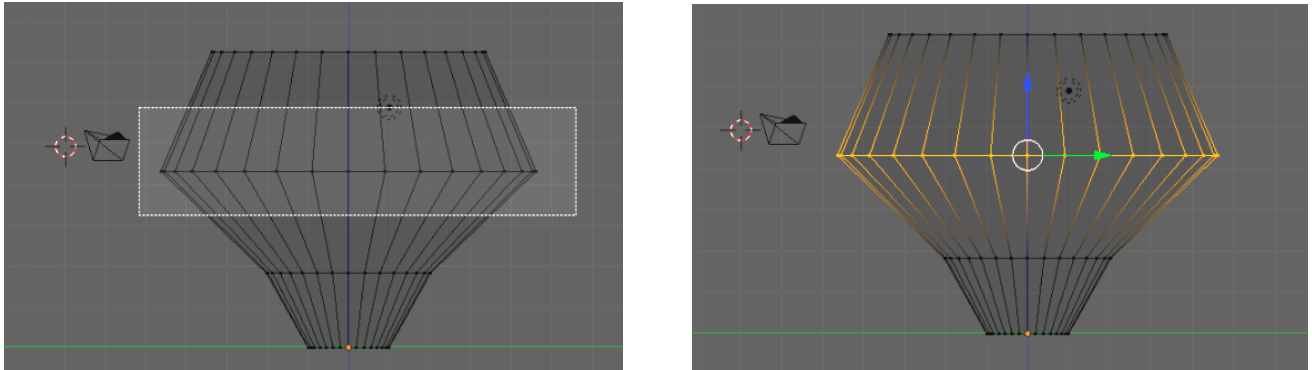


## Selecting a specific ring

You're almost done, but one of the loops in the middle needs adjustment. Here's how.

1. Go into Wireframe (press **Z**).
2. Go to front or side view (**1** or **3**).
3. Toggle **A** so that nothing is selected.
4. Press **B**, which is "box select." Cross hairs will appear, click to start a box around the section you'd like to correct and click to end the box. That selects the entire ring. Now you can **S**, **G**, or **R** those vertices however you like.

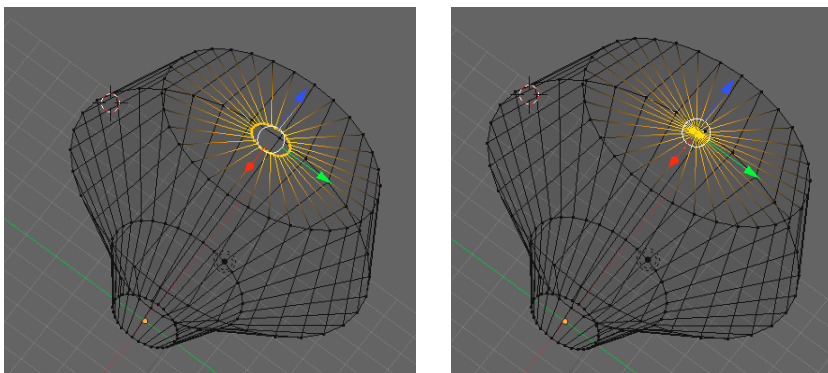
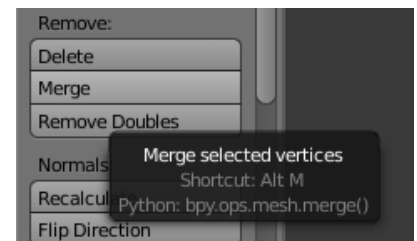
Below, box select being used in wire frame mode to isolate a ring in the middle of an object.



## Closing the end

If your object needs to be closed at an end follow these steps:

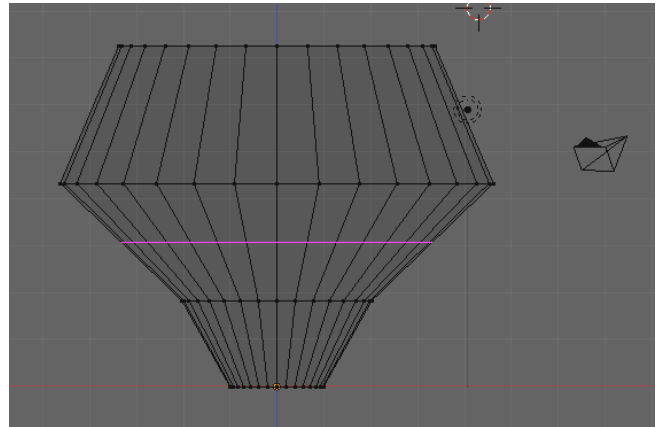
1. Use the above method to select the end ring.
2. Press **E**, then immediately press **S**. Move your cursor towards the middle of the ring until your vertices are very close together. **LC** to accept.
3. While that small circle is selected, go to the toolbar on the left of the Blender window and look for the word **Merge**. Click it. Choose **Merge at center**. That's it!



## Adding a Loop

Maybe you got so far and wish you could have added a ring in the middle of a structure to help round out a curve or add some detail.

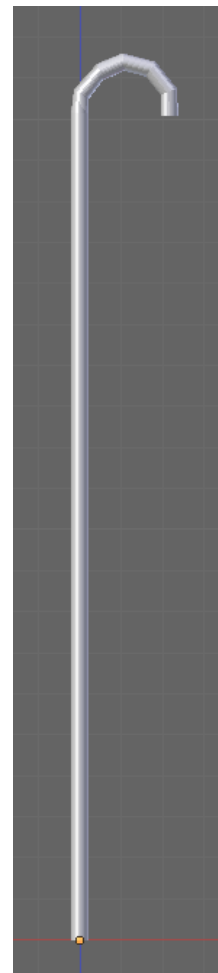
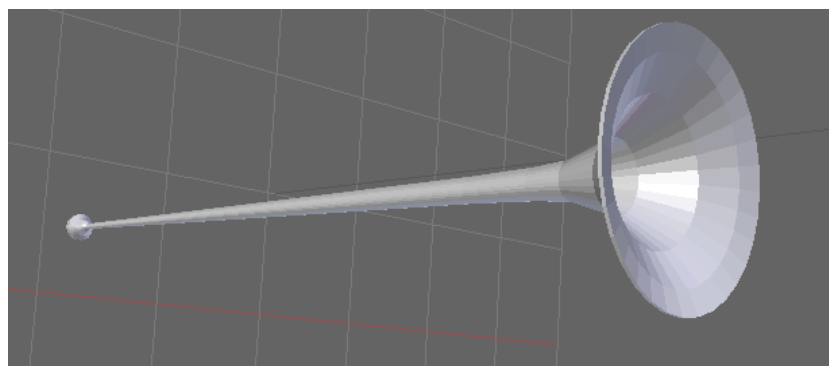
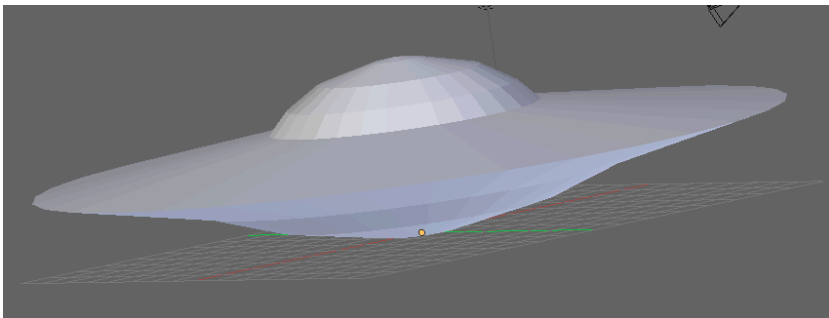
1. Press **1** or **3** to get to a side or front view.
2. Toggle **A** so that nothing is selected.
3. Place the cursor near the area where you would like to add a loop.
4. Press **control + R**, a pink line will appear, move the line with your mouse or stylus until it's where you want the loop. **LC** to confirm the placement. The Grab transform will automatically be selected so you will be able to slide the ring. **LC** again to lock the new vertices. You can now scale them to get the curvature that you want. If you want to move them use **G**, or **G** then **X**, **Y**, or **Z** to constrain the direction.



## Finishing

Press **Z** to make your object appear solid again. Look at it from different points of view by rotating using the number pad or using [**option**(Mac) or **alt**(PC)] + **LD** (Left Mouse drag).

## Examples

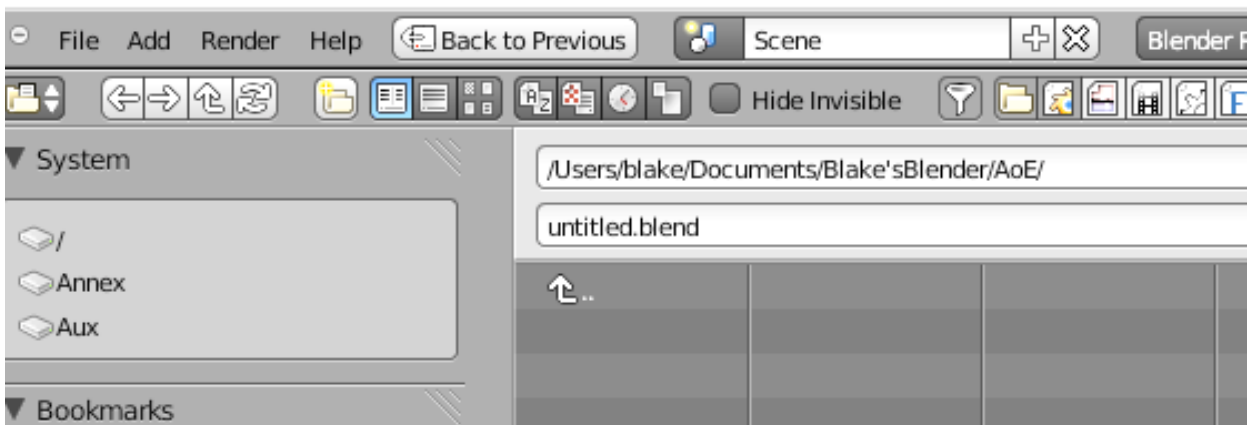


## Saving your work

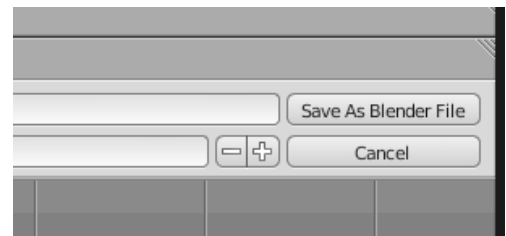
Make the adjustments that you want and Save under a concise and descriptive file name.

Just a reminder...

1. To save your session, go to the top menu bar click **FILE**.
2. Then select **SAVE AS (cmd+ sft + S )**
3. A gray navigation window will open up. Navigate to the folder that you set up. Navigate by clicking on the white arrow to go up in the hierarchy or the folders to go lower until you get to your new empty folder.
4. Above the white arrow, you see the words **untitled.blend** . Change the word untitled to your new filename. Be sure to leave the **.blend** part there.



5. Now you can save it by clicking on the **Save as Blender File** button.



Once a file is saved, as you work just use the Save shortcut, **cmd + S** or the Save As shortcut **shift + cmd + S** to save efficiently and frequently. I usually sequentially rename my files after a half hour of work so I have a progression in case I mess something up, I can go back in half hour increments.

## Looking Ahead

Next Lesson, we'll use some of our new extrusion skills to make some more complicated objects. We'll learn about adding and deleting individual vertices and when that's a good choice.

### *Wrap Up*

Congratulations! That concludes Lesson 2. Extruding is one of the most powerful mesh building tools. Play around with extruding by selecting points, faces and vertices to extrude. See what other kinds of shapes you can develop.

There are numerous online resources for working in Blender and it's a good idea to look at a variety of tutorials.

Enjoy!