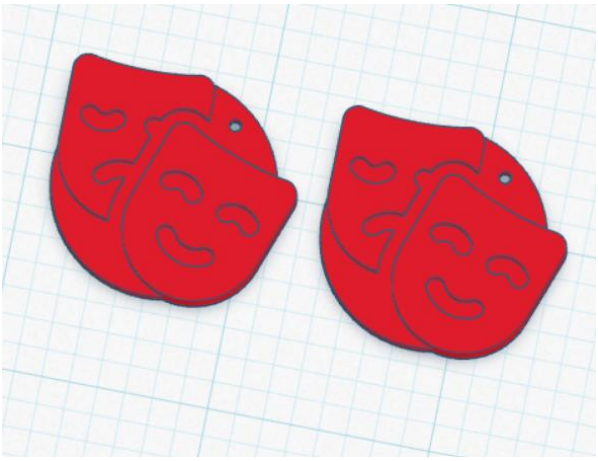
Introduction to 3D Modeling for Costumes



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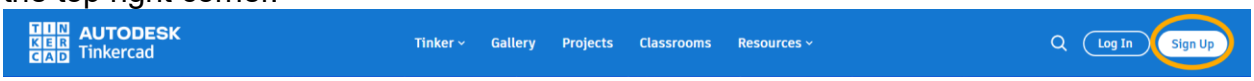
Class Objective:

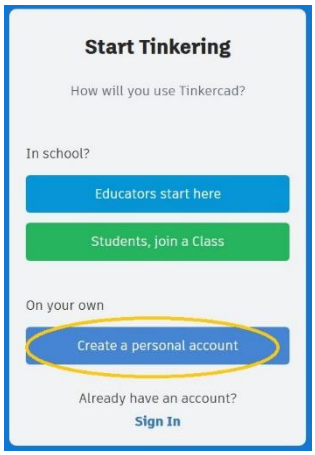
3D Printing is becoming a more widely used technology for many areas of theatre, including costumes. The goal of this class is to give participants a quick overview of one type of 3D modeling software that can be used to create 3D printed objects for theatre. By the end of this lesson, all participants will have a finalized pair of earrings that will be ready to be printed on a 3D printer.

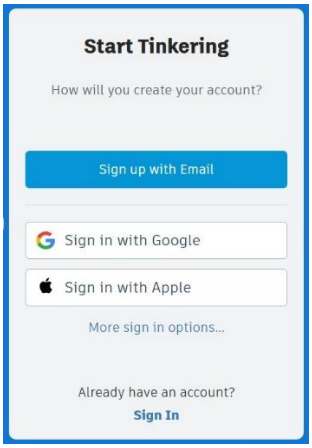
Getting Started:

Go to www.tinkercad.com and if you don't already have an account select, "Sign up" in the top right corner.

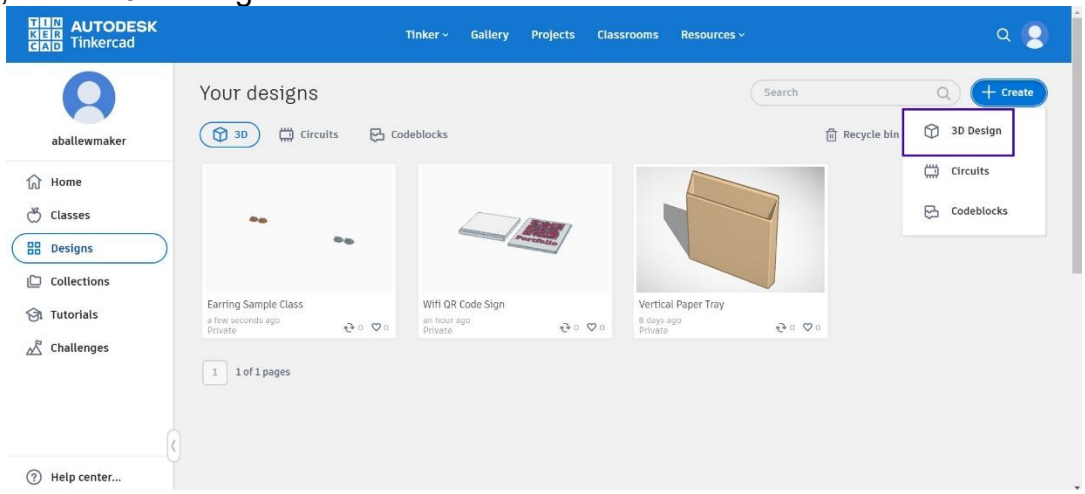


From there, select "Create Personal Account" and choose your preferred method of account sign up. I personally use "Sign Up with Email." You should be able to log in immediately without the need for account verification.

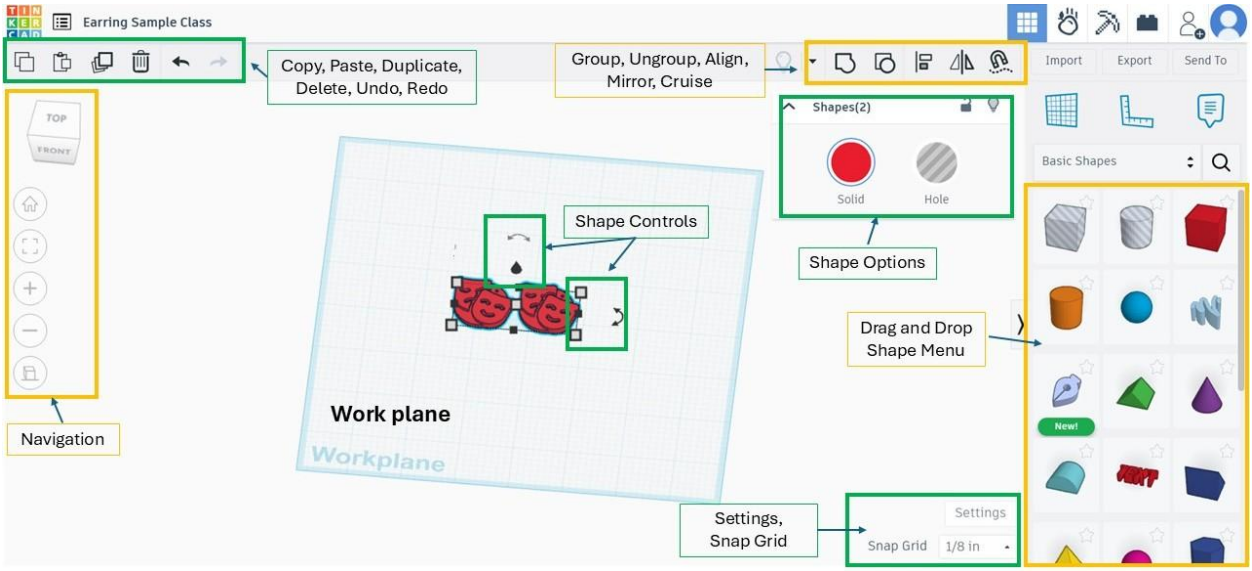




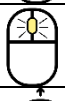
From the home screen, in the top right corner, select "+ Create." From the drop down menu, select "3D Design"



Interface and Controls Quick Start Guide:

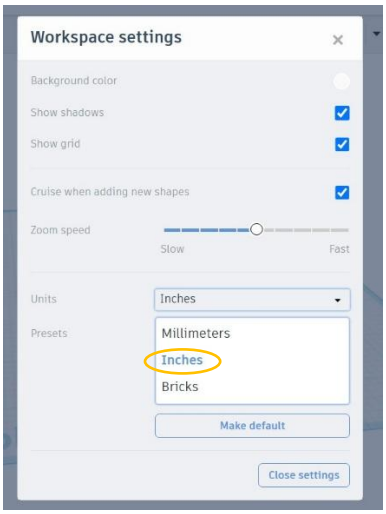


Navigation:

Move Object	Hold Left Mouse Button	
Orbit View	Hold Right Mouse Button	
Pan	Hold Middle Mouse Button	
Zoom	Scroll Middle Mouse Button	

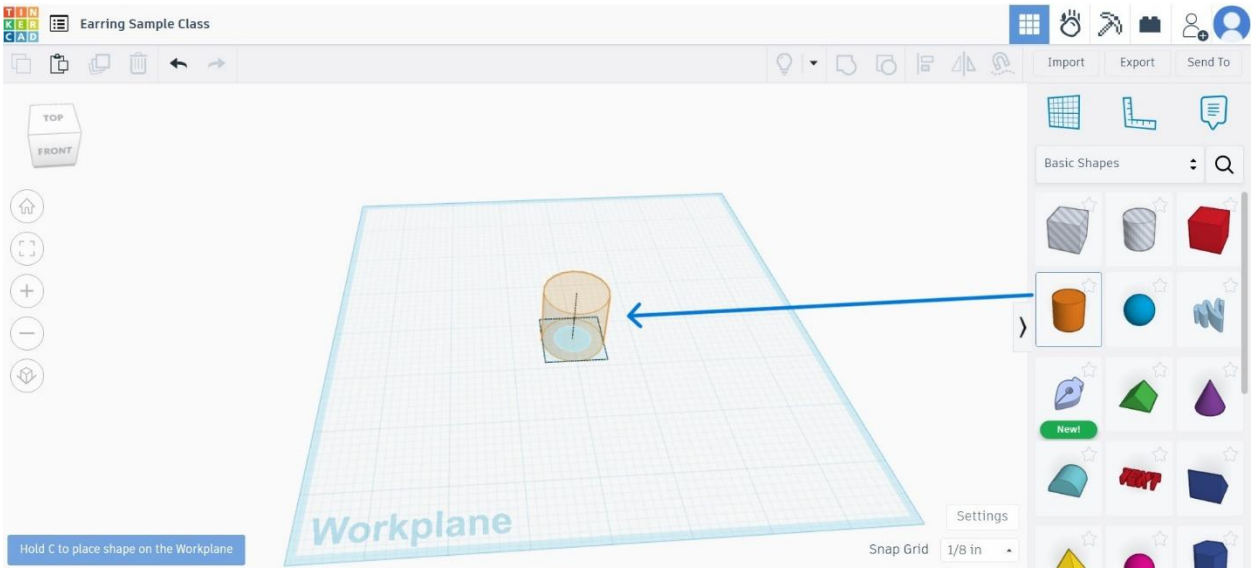
OR use the orbit view cube

Changing the Settings:
Click the “Settings” button in the bottom right corner. A pop-up window will appear. From the “Units” drop-down menu, select “Inches” then “Close Settings.”

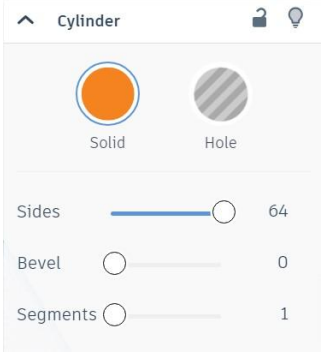


Making the Earrings

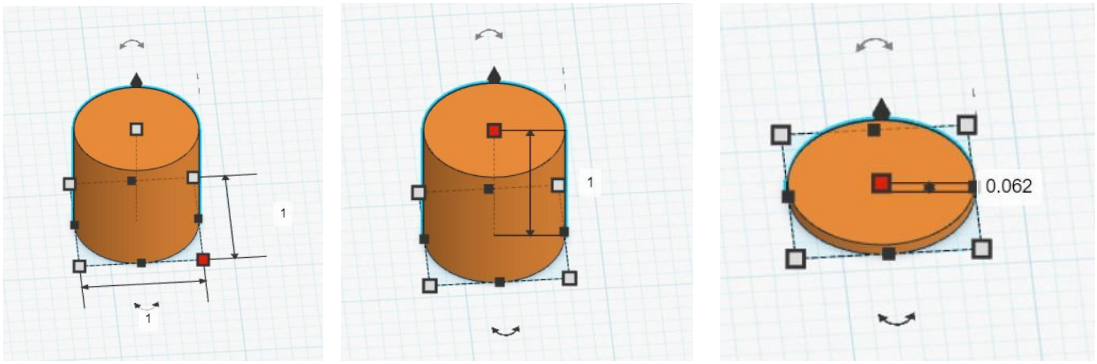
Base Shape:
Drag a regular cylinder from the shape menu and drop anywhere on the work plane.



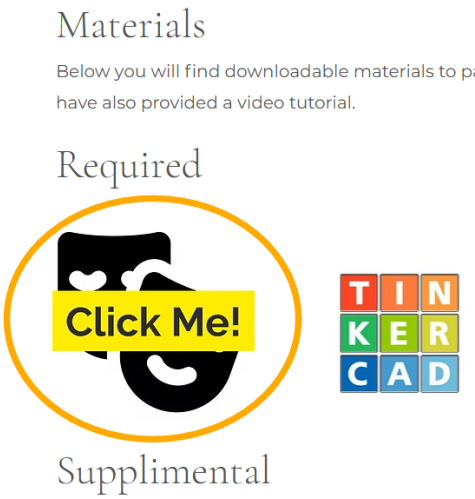
Expand the shape options menu in the top right corner of the work plane. Drag the “Sides” slider all the way to the right to smooth out the sides of the cylinder.



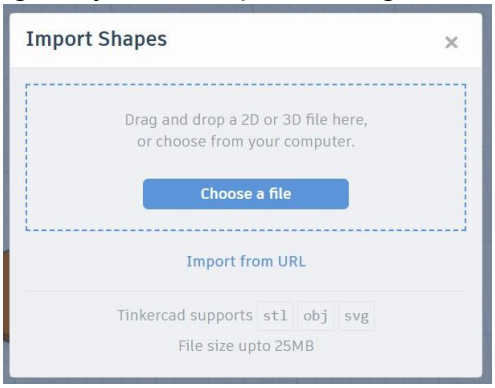
Click on one of the cylinder’s corner handles. You’ll see the size of each size of the cylinder and can click on the number box to change the size. Each size should be “1.” Next, click on the size handle hovering over the top of the cylinder. Change this to “0.062.”



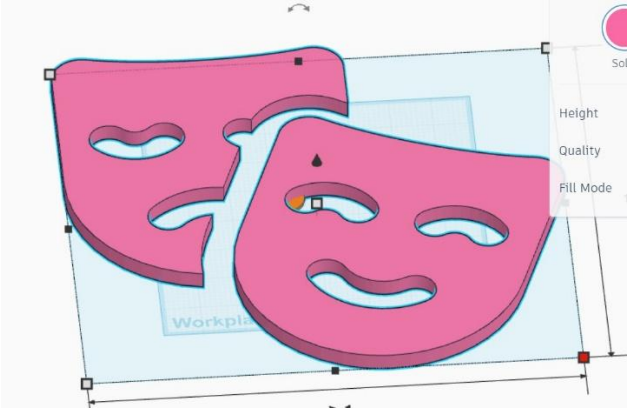
Import an image:
Go to www.amyballew.com/sampleclass and download the drama mask file under “Required Materials”

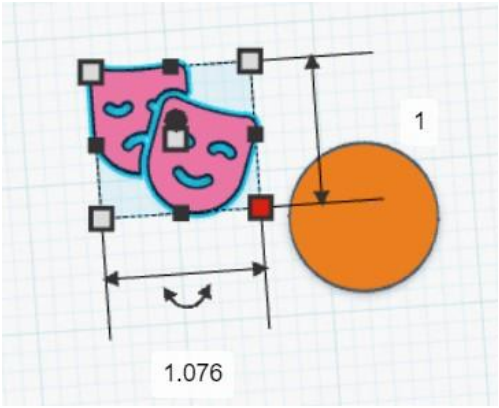


Return to Tinkercad and click the “Import” button in the top right corner. There is no need to change any of the import settings.

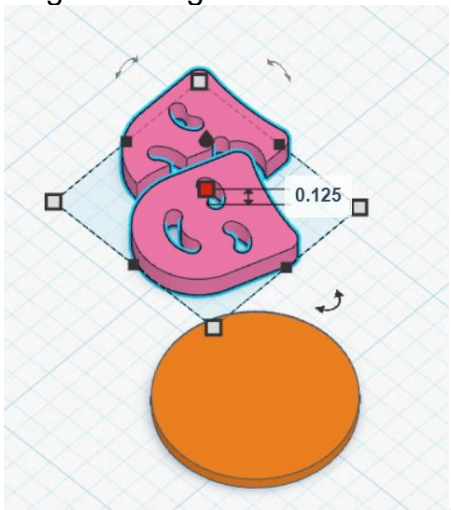


Once it uploads, it’s really big! Let’s resize it. Zoom out to see the resize handles. Press and hold SHIFT while dragging one corner. Holding SHIFT keeps the proportions locked while resizing. Continue to drag the handle until the vertical size is “1.”





Click the center handle to change the height to 0.125



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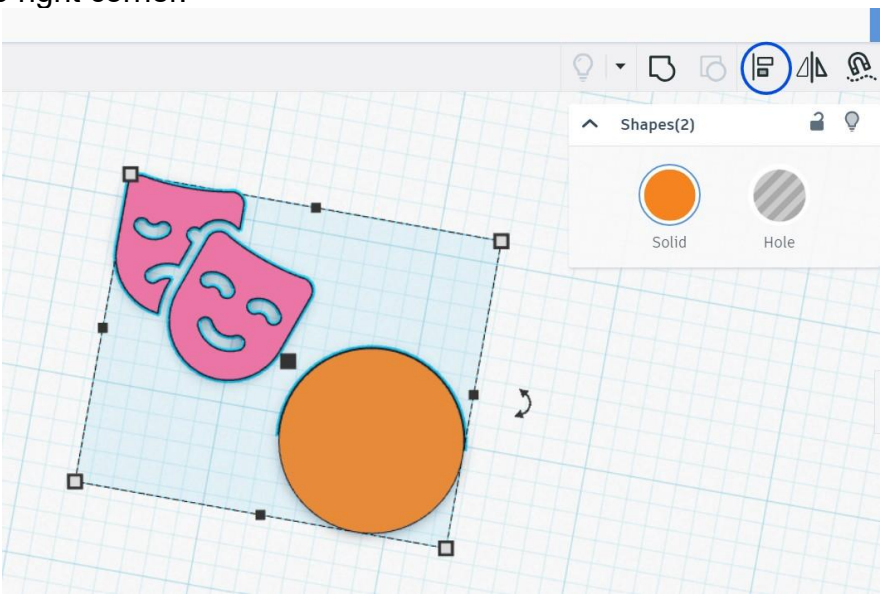
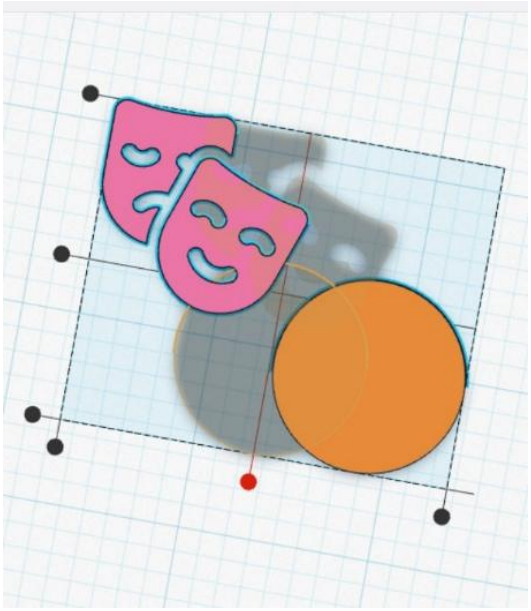
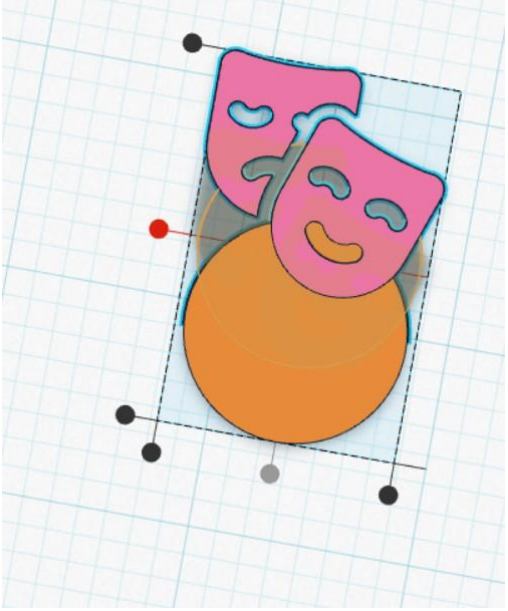
Merge the shapes into one object:
LEFT CLICK and drag the selection box to select both objects OR use the shortcut CONTROL/COMMAND-A to select all. After both objects are selected click the “Align” tool in the top right corner.

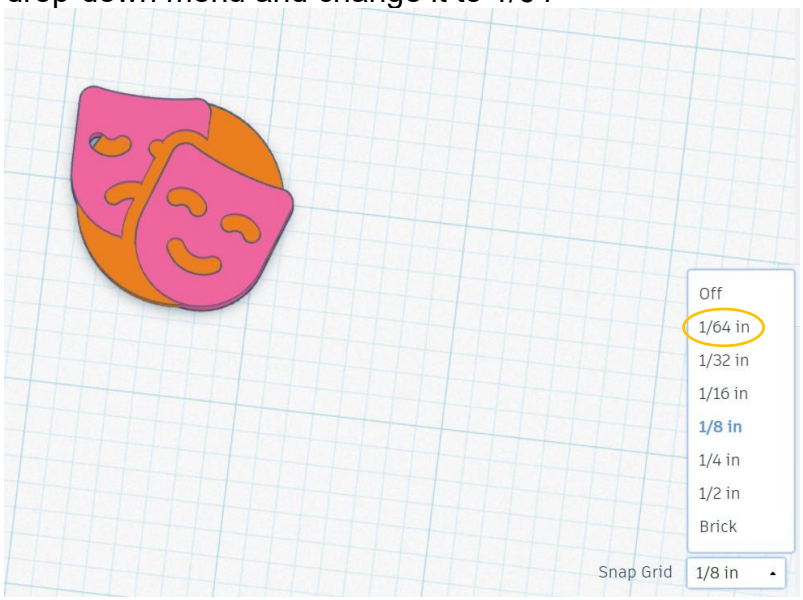


A new set of handles will appear. Click the bottom center handle to center align the objects vertically. Then click the center side handle to align the objects horizontally.

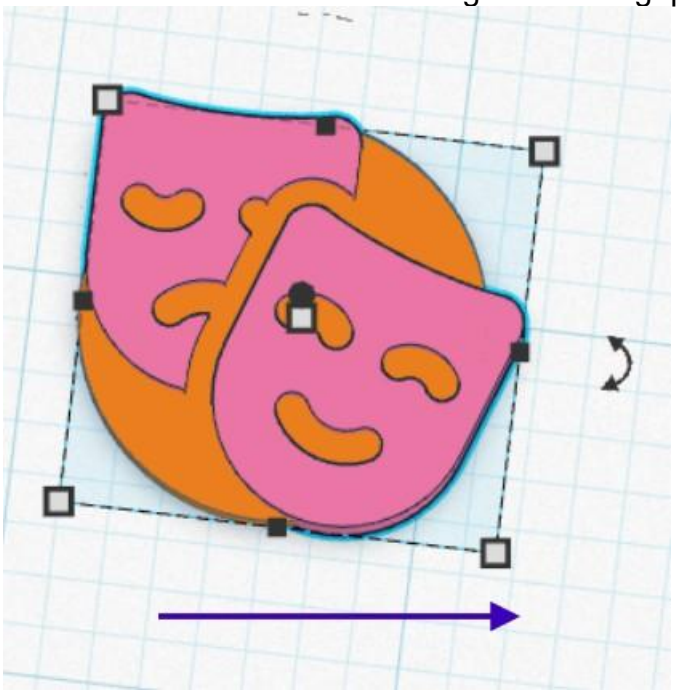




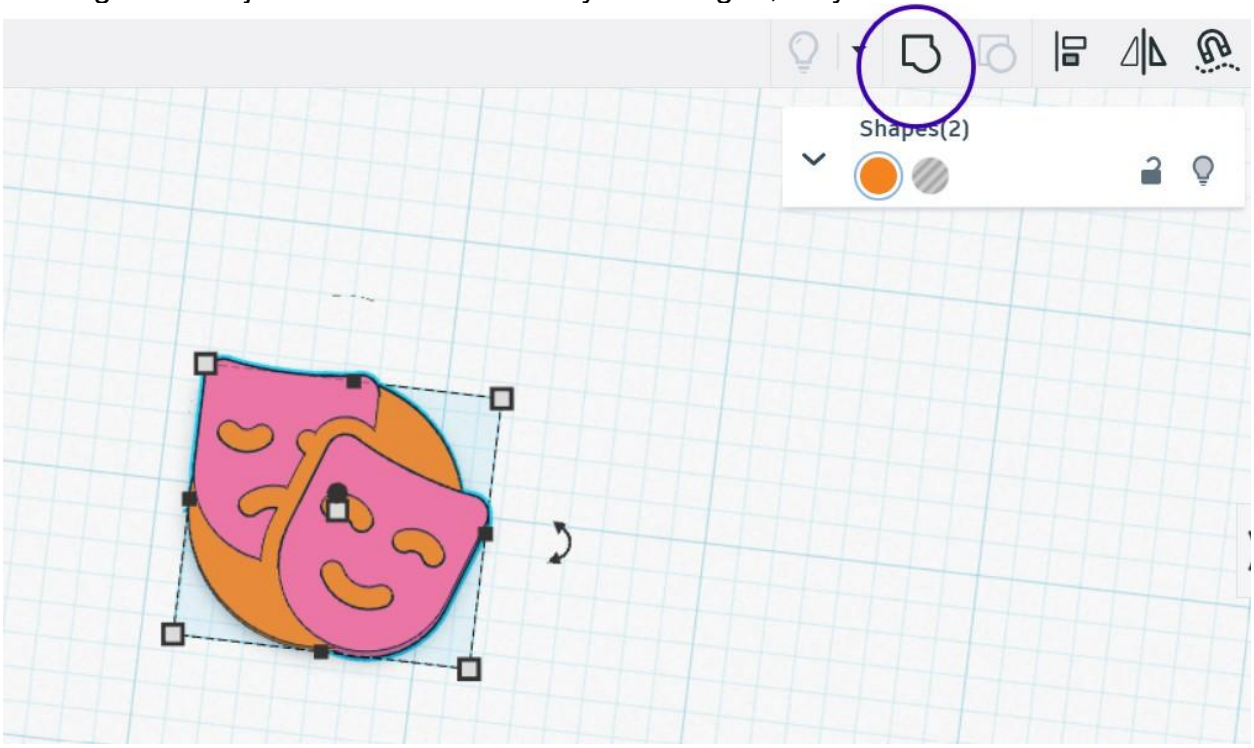
Deselect the objects by clicking any area other than the objects. With the objects aligned, there is a gap between the base circle and the tragedy mask eye. To correct this we can move the masks shape with the snap grid. In the bottom right corner, select the “Snap Grid” drop-down menu and change it to 1/64th



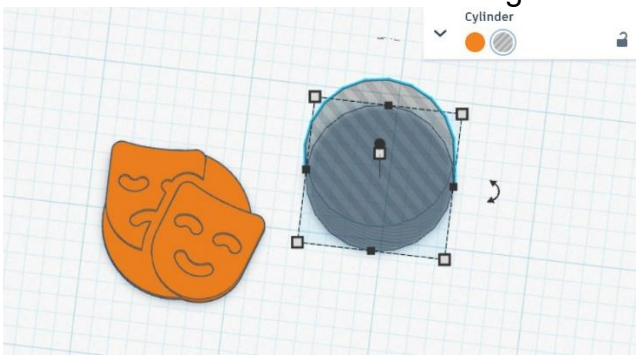
After changing the snap grid measurement, select the mask object only. Tap the Right Arrow Key (→) 3 times to move the masks over enough to fill the gap.

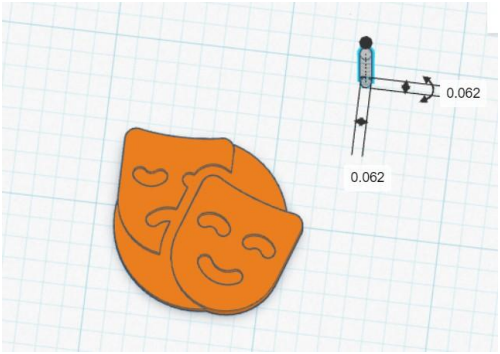


Select both objects (CTL/CMD – A), then click the “Group” button in the top right corner to merge both objects into one. Once they are merged, they will become one color.

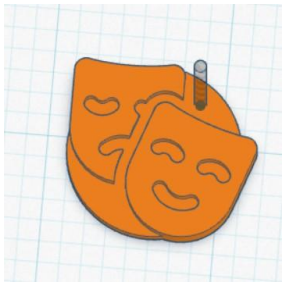


Create a hole for earring findings:
Drag the shaded cylinder shape onto the work plane. This object will create a hole when grouped with other objects. *(Alternatively, any shape can be made into a hole from the shape options drop down menu.)* Click one corner handle and change the size to 0.062 on each side. You do not need to change the height.

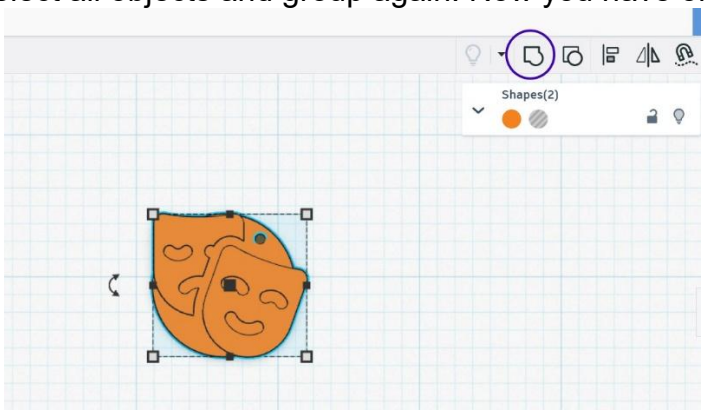


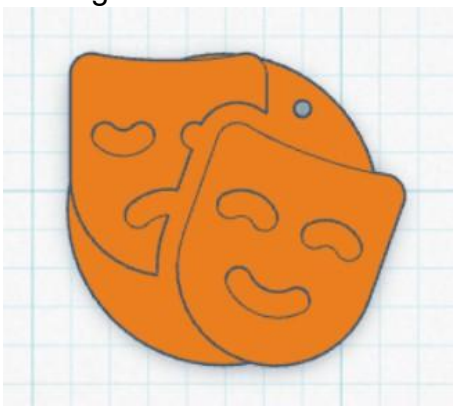


Drag the cylinder hole on top of the earring right above the comedy mask and close to the edge as pictured below.

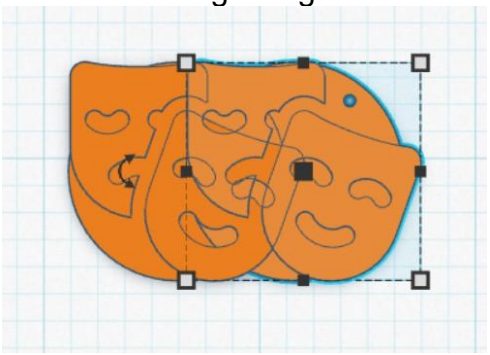


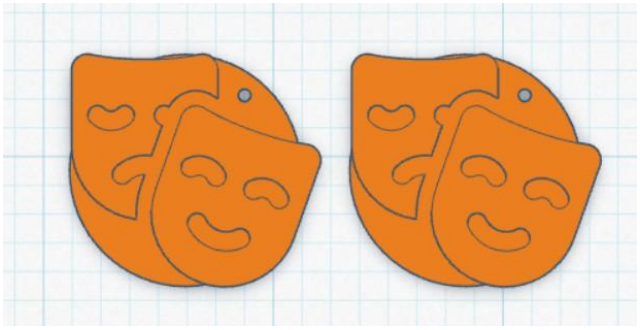
Select all objects and group again. Now you have one earring!



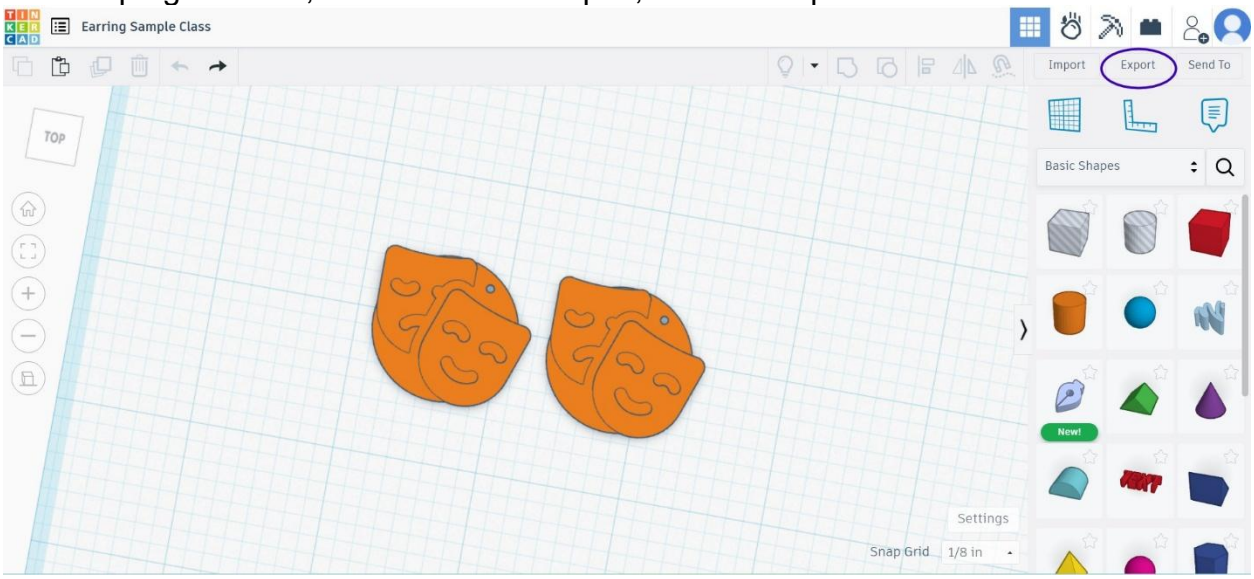


To make 3D printing easier, we should make a second copy so it prints as a pair. Select the earring and use the shortcut CONTROL/COMMAND-C to copy or select the copy button in the top left corner. Then use the shortcut CONTROL/COMMAND-V to paste the second earring. Drag the second earring so they sit separate on the work plane.

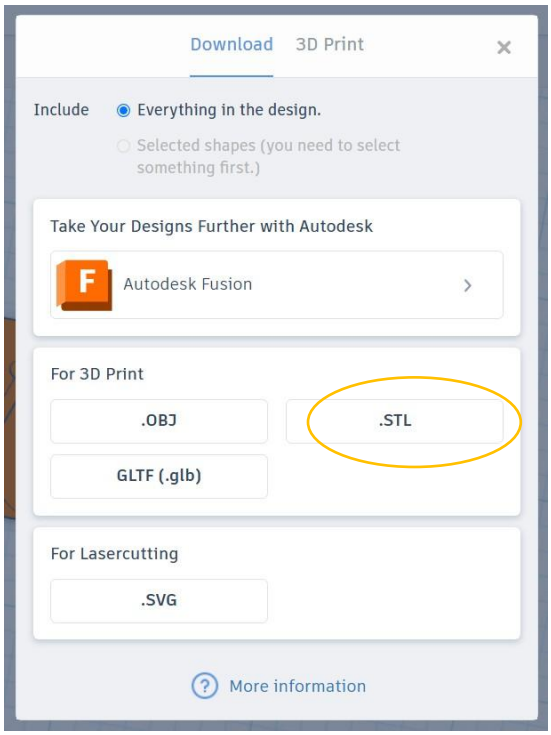




Export for 3D printing!
In the top right corner, over the basic shapes, click the export button.



From the pop-up menu, select include “Everything in the design” and under 3D print click the “.STL” button. And now you have a file ready to print! Take your file to your local makerspace for printing. After printing, add earring findings to wear your new accessory!



To learn more 3D modeling with Tinkercad, visit:
https://www.tinkercad.com/learn