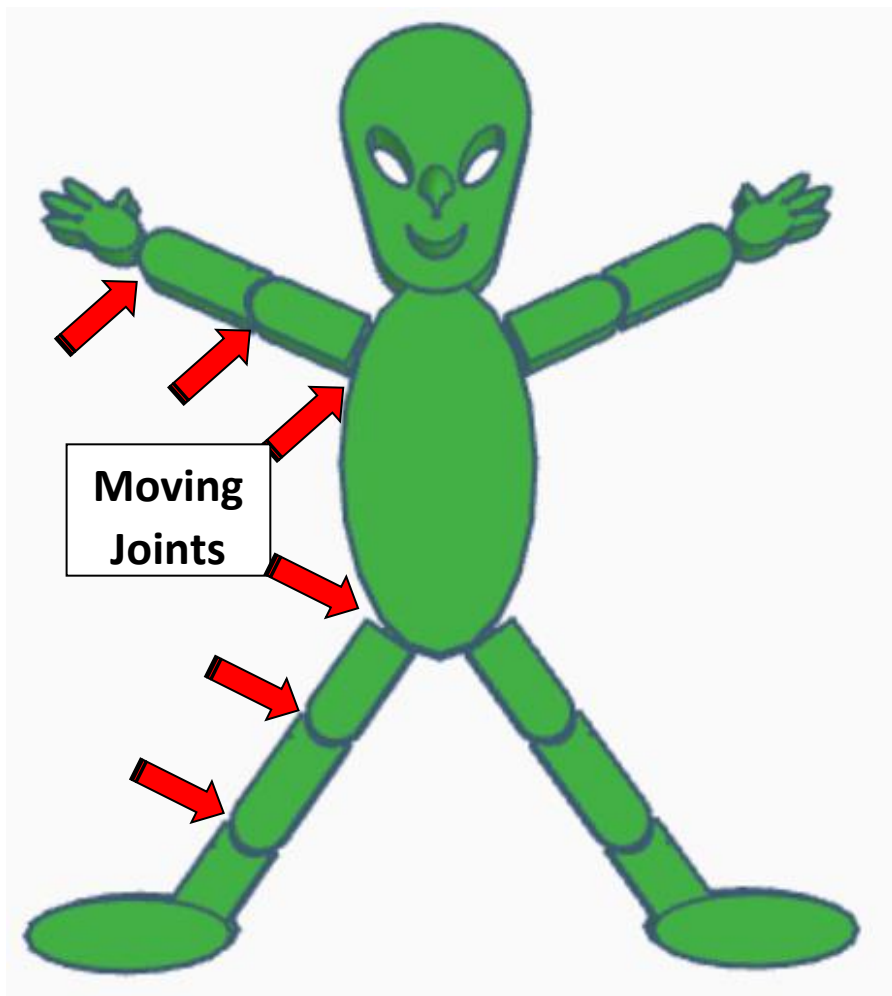


T I N  
K E R  
C A D

# Dancing Alien



# **Contents:**

<b>Cover.....</b>	<b>1</b>
<b>Table of Contents.....</b>	<b>2</b>
<b>Alien Head.....</b>	<b>3</b>
<b>Head .....</b>	<b>3</b>
<b>Mouth.....</b>	<b>4</b>
<b>Eyes.....</b>	<b>8</b>
<b>Nose.....</b>	<b>11</b>
<b>Body.....</b>	<b>15</b>
<b>Legs.....</b>	<b>28</b>
<b>Arms.....</b>	<b>48</b>
<b>References.....</b>	<b>64</b>
<b>Tool Guide.....</b>	<b>66</b>

## **Disclaimer:**

Locations of objects move on a regular basic in TinkerCAD. Although locations of objects are stated, that is the location at the time of publication. This publication has no association with TinkerCAD and does not control when TinkerCAD moves objects.

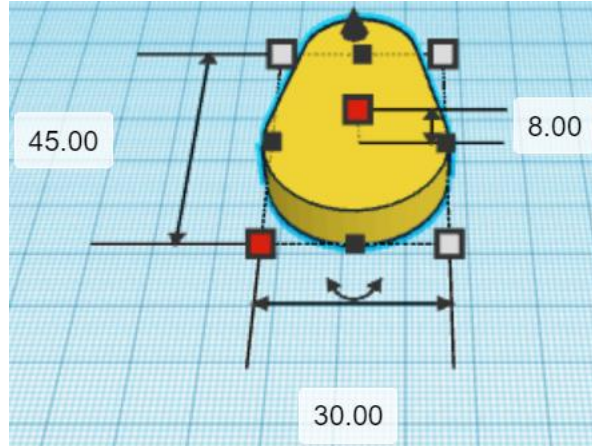
To accommodate for objects moving locations, it is suggested to add the most used objects to “Favorites”. This acts as a shortcut to the object no matter where it is moved to. To add objects to Favorites, hover the mouse over the object and in the upper right corner, an outlined star will appear. Click on the star changing it to yellow in color. The object will now appear in the Favorites area.

# Alien Head:

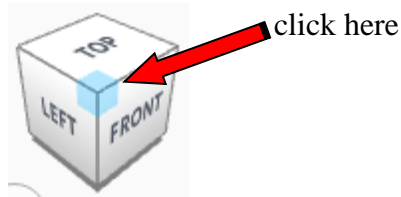
## Head:

Bring in a Circular Trapezoid, located in Shape Generators and then All, (things in All move each time that TinkerCad adds items to All), this was last seen in the center, 24 objects down.  
From now on this will be called the **Head**

Change the dimensions to 30mm X direction, 45mm Y direction, and 8mm Z direction.

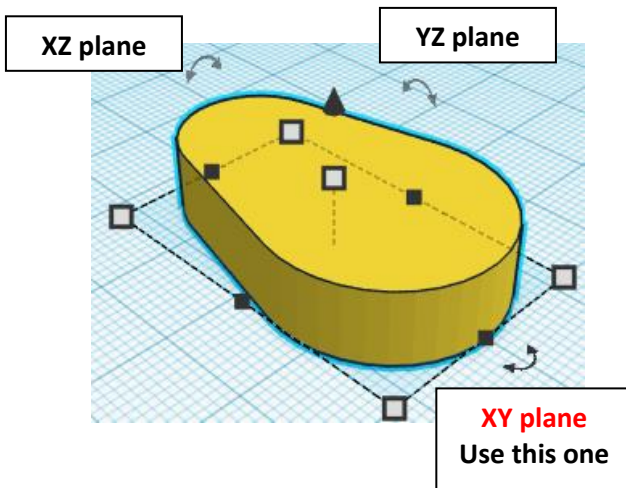


Go to TOP LEFT FRONT view for rotations

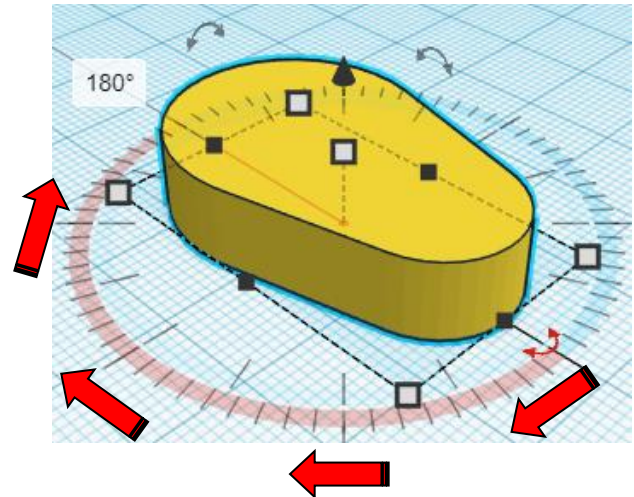


**Rotate** the Head clockwise 180 degrees in XY plane.

Before



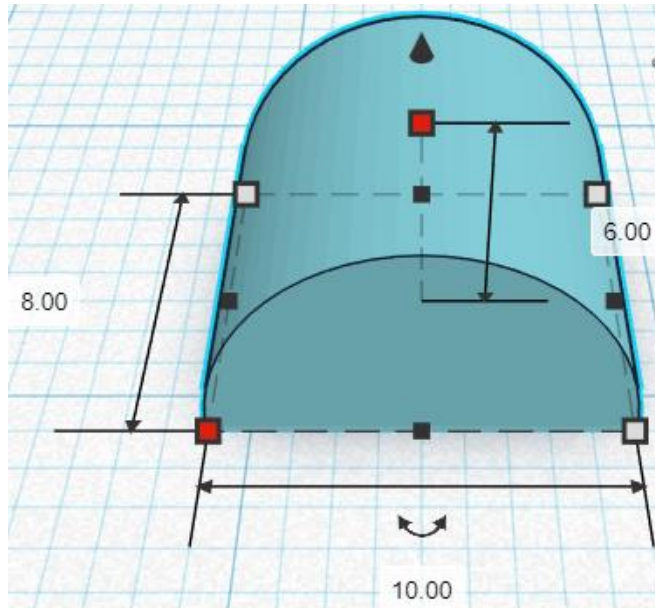
After



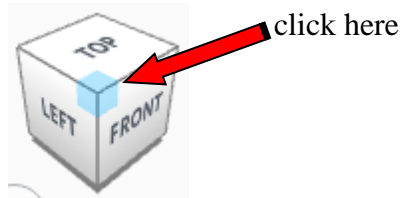
**Mouth:**

Bring in a Round Roof, located in Basic Shapes on the right 3 shapes down. From now on this will be called the **mouth**.

Change the dimensions to 10mm X direction, 8mm Y direction, and 6mm Z direction.

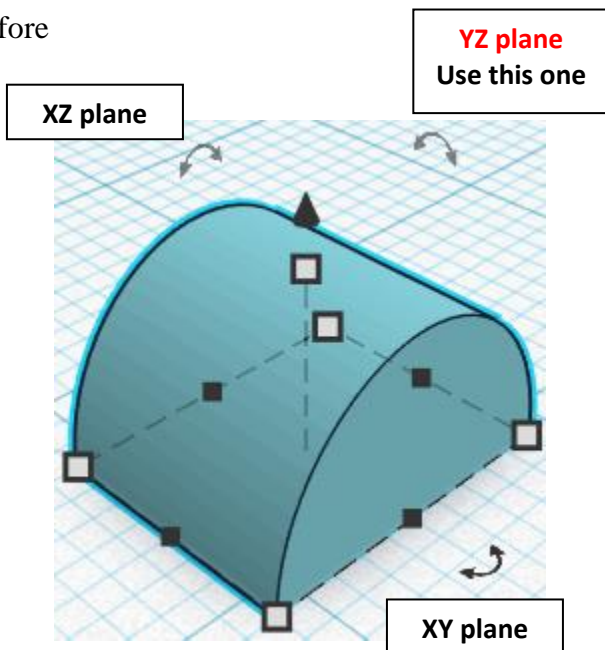


Go to TOP LEFT FRONT view for rotations

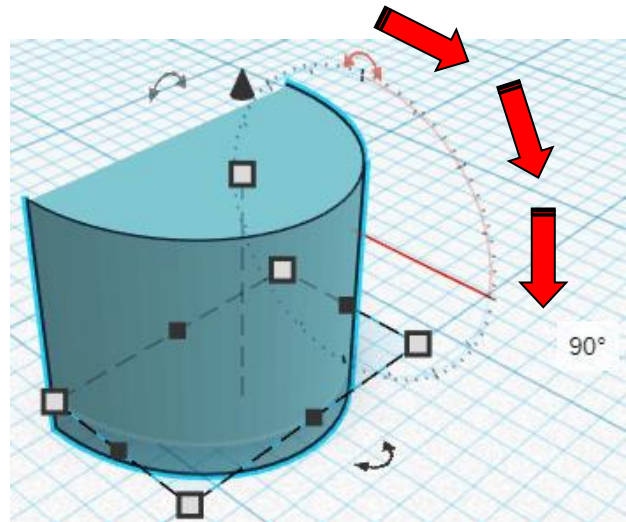


**Rotate** the Mouth clockwise 90 degrees in YZ plane.

Before



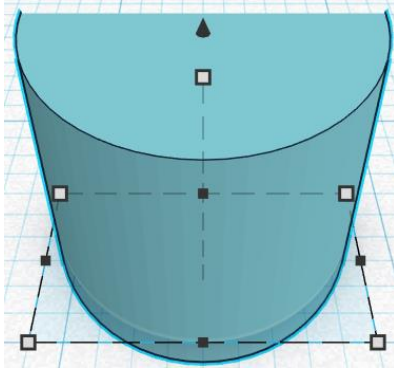
After



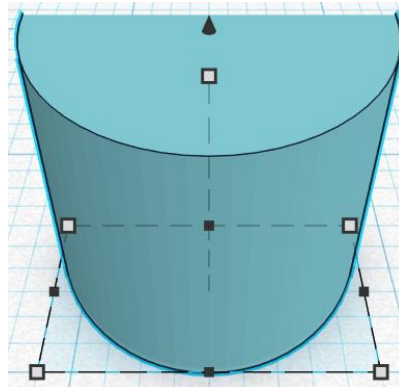
**Set on Workplane:**

Select the Mouth and type "d" to set the Large Gear on the work plane.

Before



After



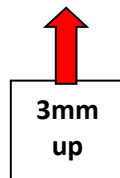
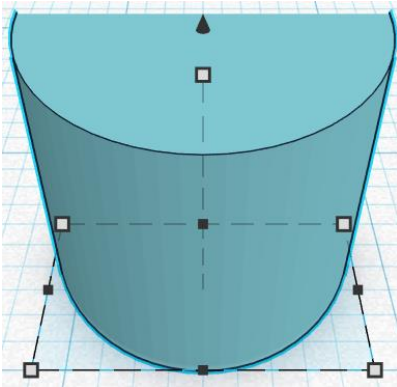
**Duplicate** Mouth 1 time

The duplicate mouth will be called **Mouth Cutout**

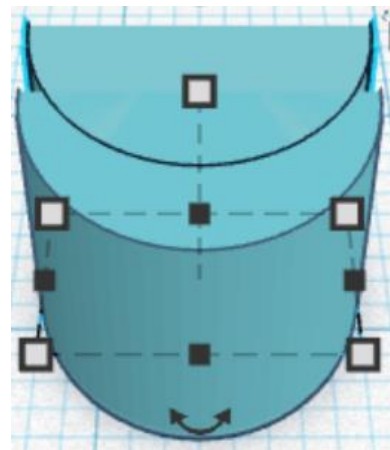
**Move** Mouth Cutout (Must be in home view for this to work!)  
move back in positive Y direction 3mm

**Hint:** Select Mouth Cutout and push up arrow key 3 times.

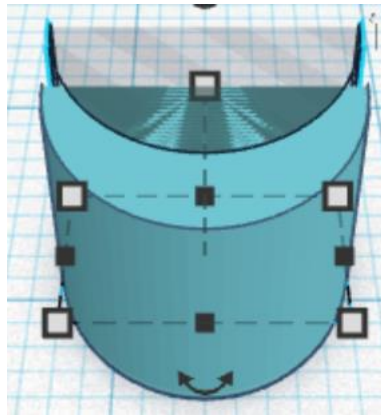
Before



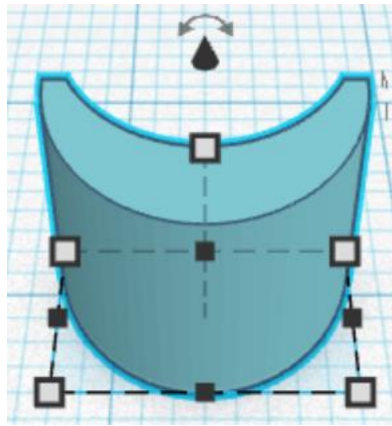
After



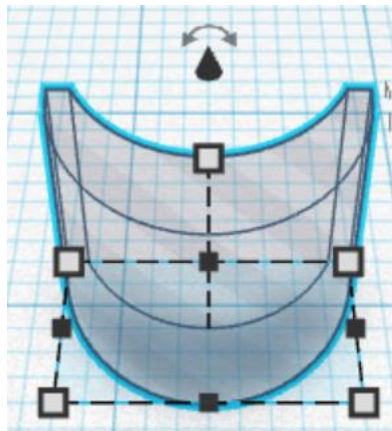
**Change Mouth Cutout to **Hole****  
by selecting Mouth Cutout and typing "h".



**Group Mouth Cutout and Mouth**  
From now on this will be called the **Mouth**



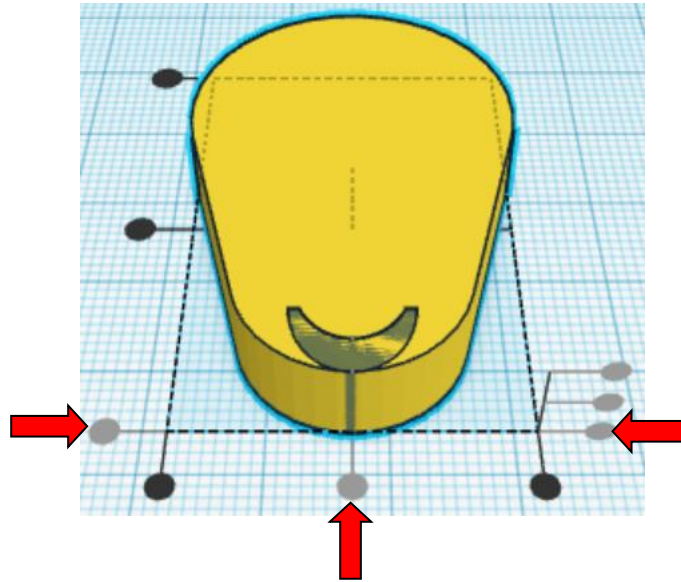
**Change Mouth to **Hole****  
by selecting Mouth and typing "h".





**Align Head and Mouth**

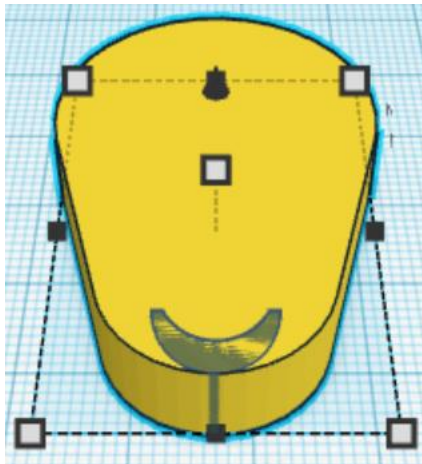
centered in X direction,  
front of Y direction, and  
bottom of Z direction.



**Move Head** (Must be in home view for this to work!)  
move forward in negative Y direction 5mm

**Hint:** Select Head and push down arrow key 5 times.

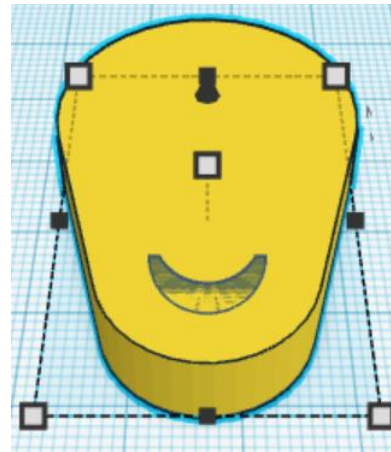
Before



5mm  
down

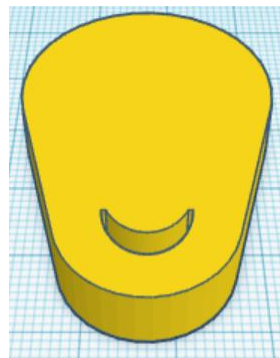


After



**Group Head and Mouth**

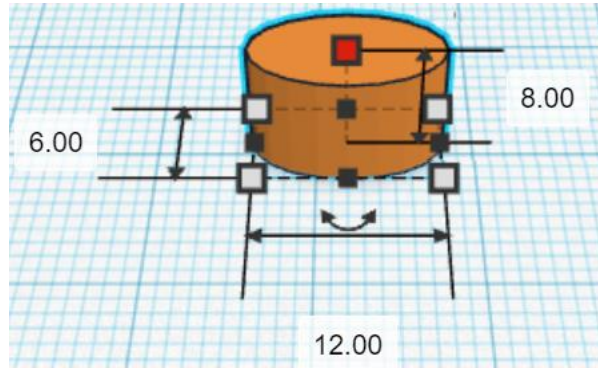
From now on this will be called the **Head**



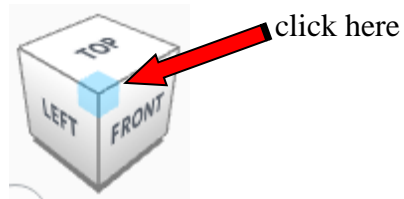
**Eyes:**

Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Left Eye**.

Change the dimensions to  
12mm X direction,  
6mm Y direction, and  
8mm Z direction.

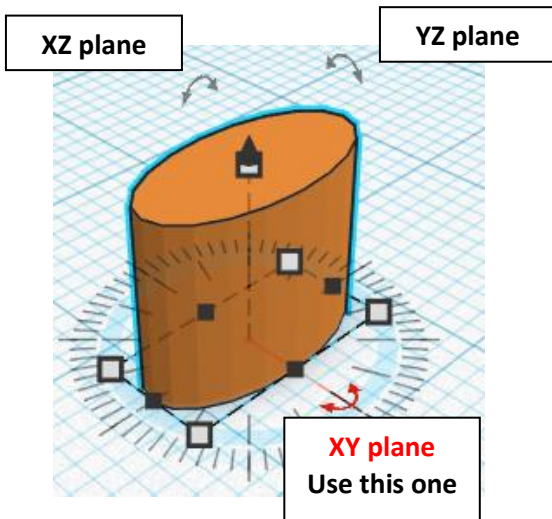


Go to TOP LEFT FRONT view for rotations

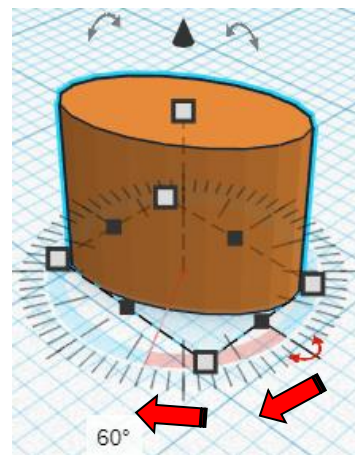


**Rotate** the Left Eye clockwise 60 degrees in XY plane.

Before



After



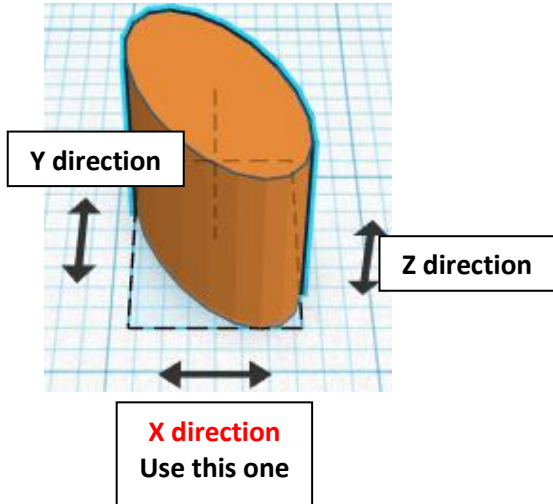


**Duplicate** Left Eye 1 time

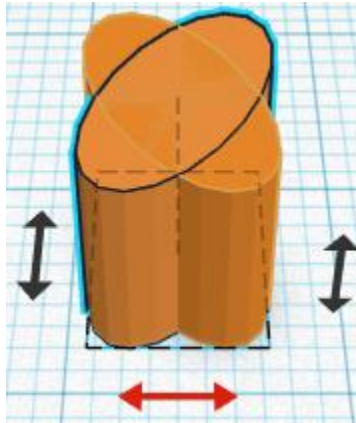
From now on this will be called the **Right Eye**

**Flip** Right Eye in X direction.

Before



After



**Move** Right Eye (Must be in home view for this to work!)  
move right in positive X direction 15mm

**Hint:** Select Right Eye and push right arrow key 15 times.

Or

Select Right Eye and hold down shift and push right arrow key 1 time.

Then release shift and push right arrow key 5 more times.

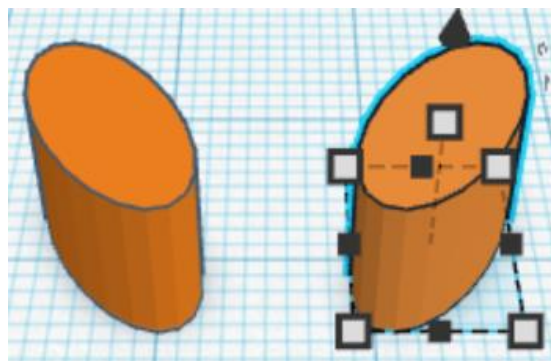
Before



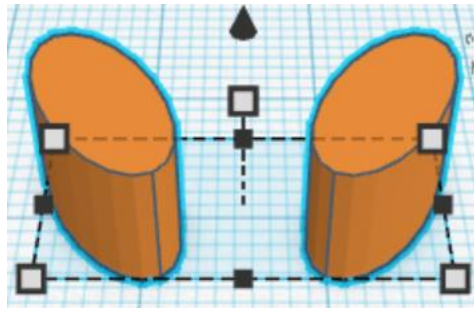
15mm  
right



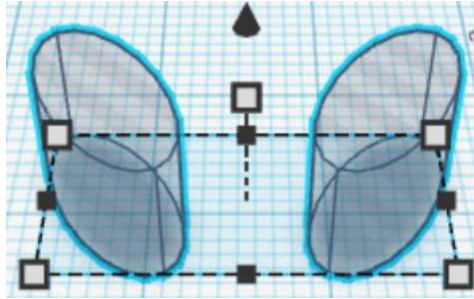
After



**Group Left Eye and Right Eye**  
From now on this will be called the **Eyes**

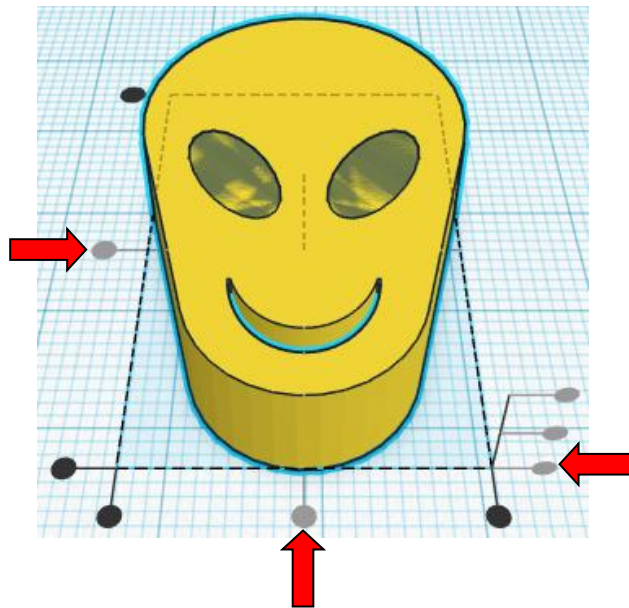


**Change Eyes to Hole**  
by selecting Eyes and typing "h".

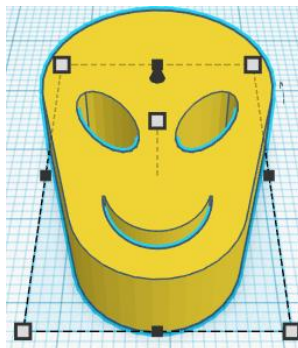


**Align Head and Eyes**

centered in X direction,  
centered of Y direction, and  
bottom of Z direction.



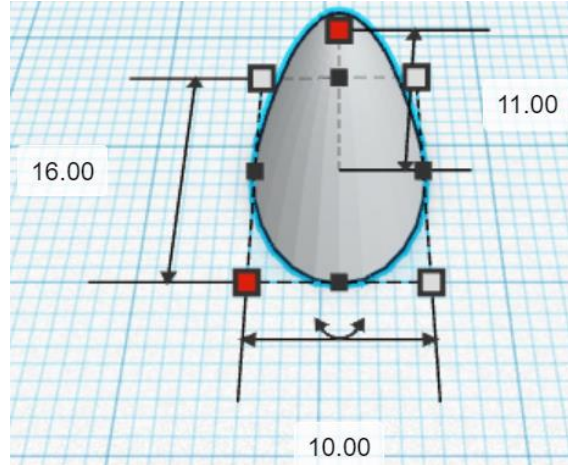
**Group Head and Eyes**  
From now on this will be called the **Head**



**Nose:**

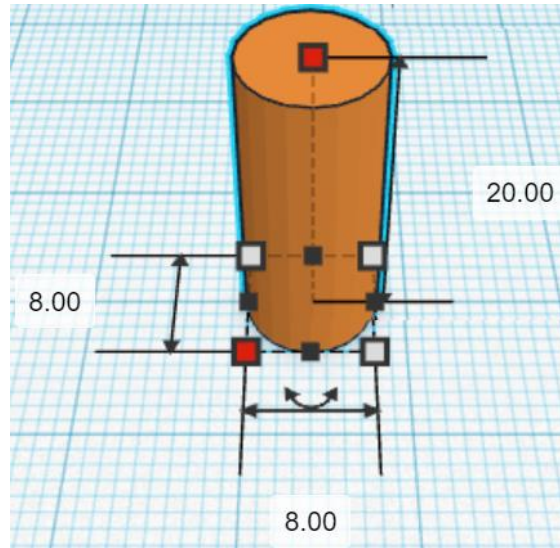
Bring in a Paraboloid, located in Basic Shapes on the right 5 shapes down.  
From now on this will be called the **Nose**.

Change the dimensions to  
10mm X direction,  
16mm Y direction, and  
11mm Z direction.



Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Left Nose Cutout**.

Change the dimensions to  
8mm X direction,  
8mm Y direction, and  
20mm Z direction.

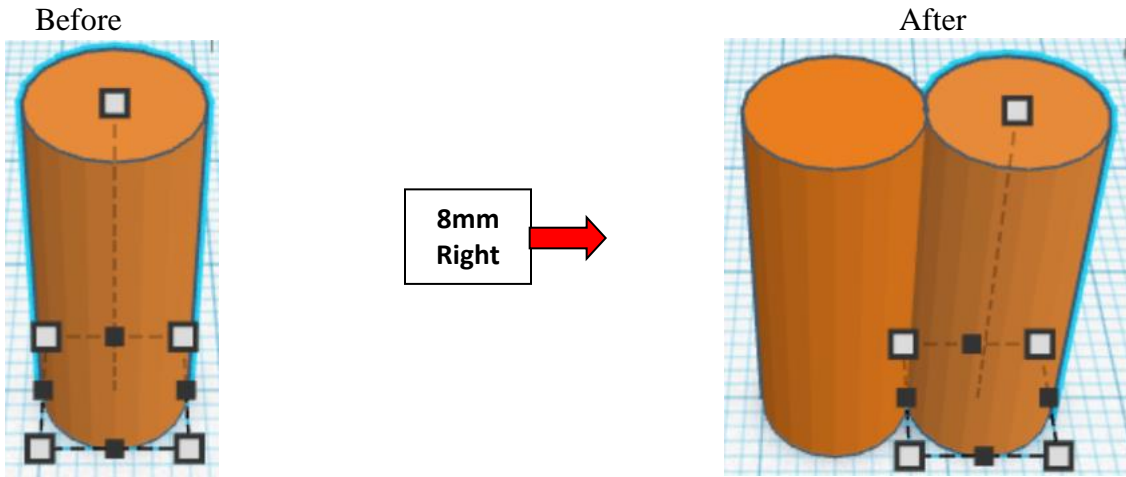


**Duplicate** Left Nose Cutout 1 time

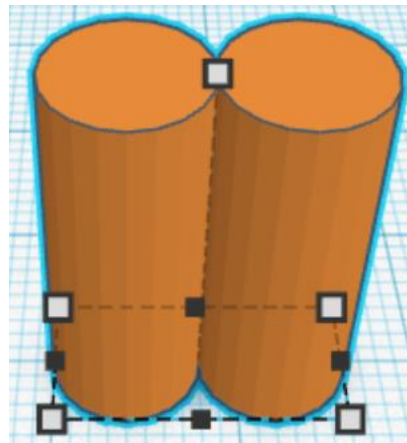
From now on this will be called the **Right Nose Cutout**

**Move Right Nose Cutout** (Must be in home view for this to work!)  
move right in positive X direction 8mm

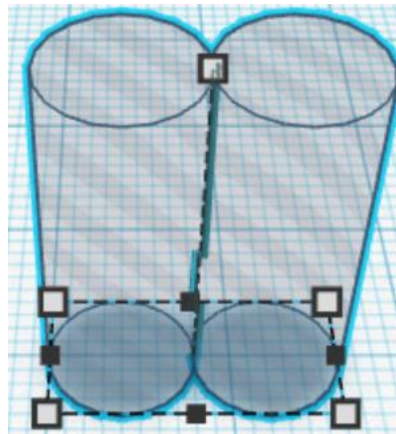
**Hint:** Select Right Nose Cutout and push right arrow key 8 times.



**Group Left Nose Cutout and Right Nose Cutout**  
From now on this will be called the **Nose Cutout**



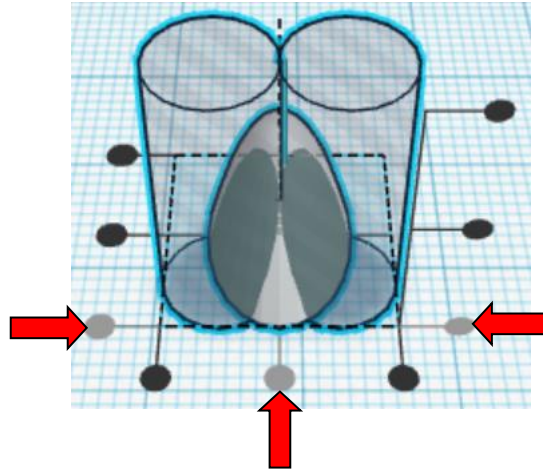
**Change Nose Cutout to **Hole****  
by selecting Nose Cutout and typing "h".





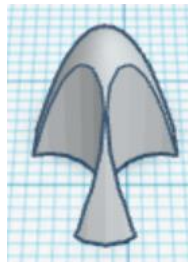
**Align Nose and Nose Cutout**

centered in X direction,  
front of Y direction, and  
bottom of Z direction.



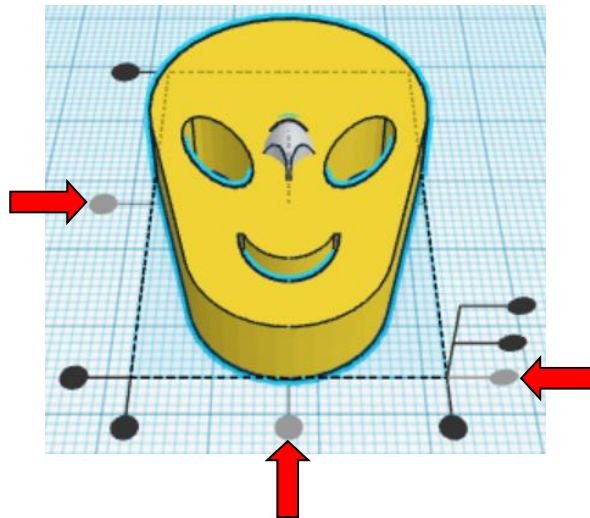
**Group Nose and Nose Cutout**

From now on this will be called the **Nose**



**Align Head and Nose**

centered in X direction,  
centered of Y direction, and  
bottom of Z direction.

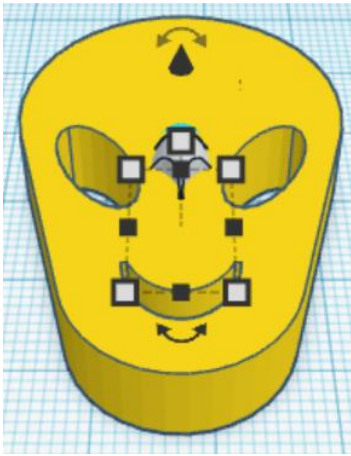




**Move Nose** (Must be in home view for this to work!)  
move forward in negative Y direction 6mm

**Hint:** Select Nose and push down arrow key 6 times.

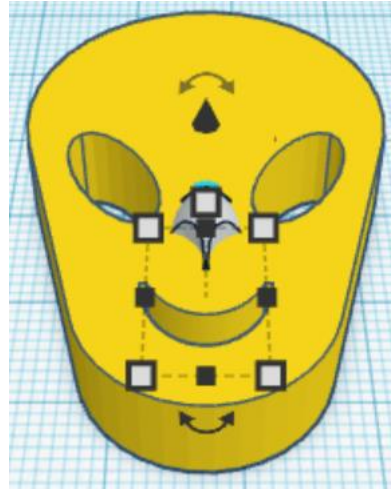
Before



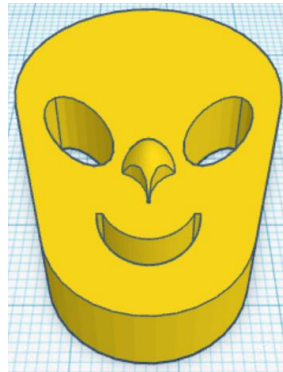
6mm  
Down



After



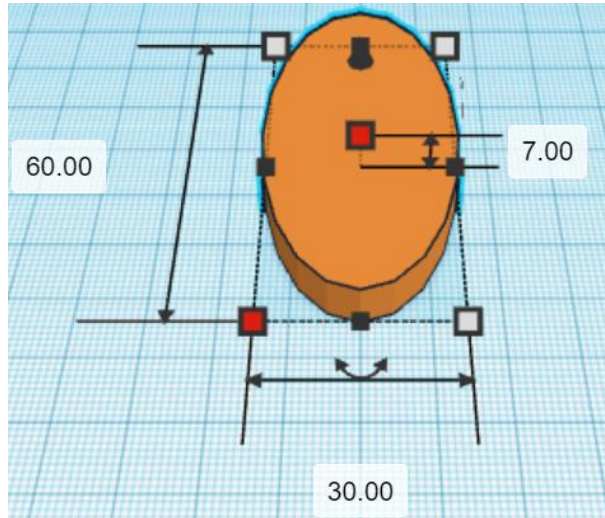
**Group Head and Nose**  
From now on this will be called the **Head**



**Body:**

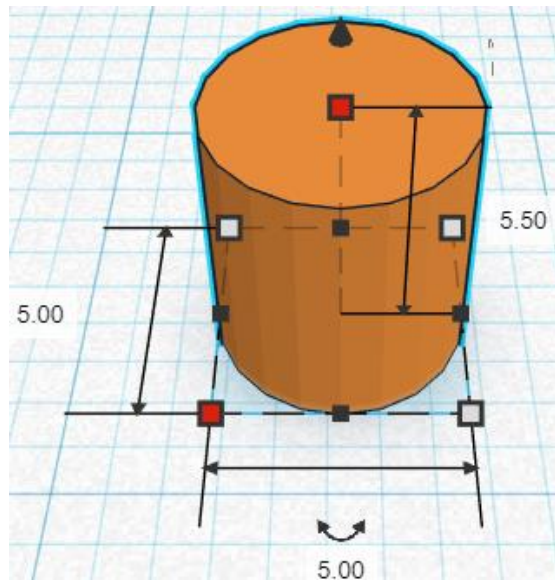
Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Body**.

Change the dimensions to  
30mm X direction,  
60mm Y direction, and  
7mm Z direction.



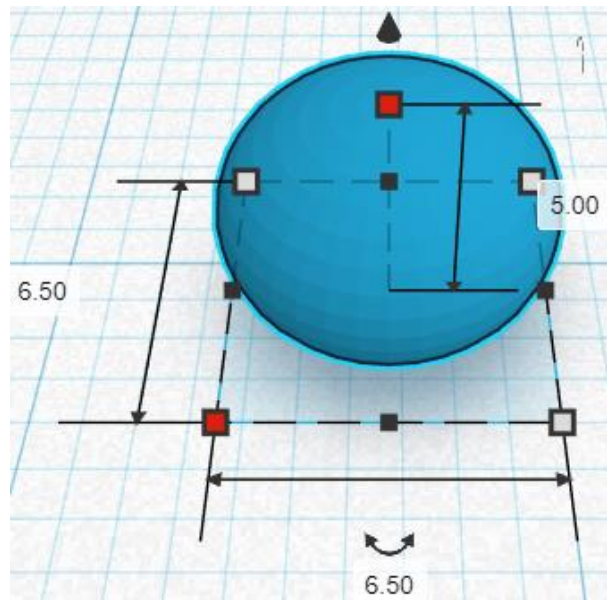
Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Hip Cutout 1**.

Change the dimensions to  
5mm X direction,  
5mm Y direction, and  
5.5mm Z direction.



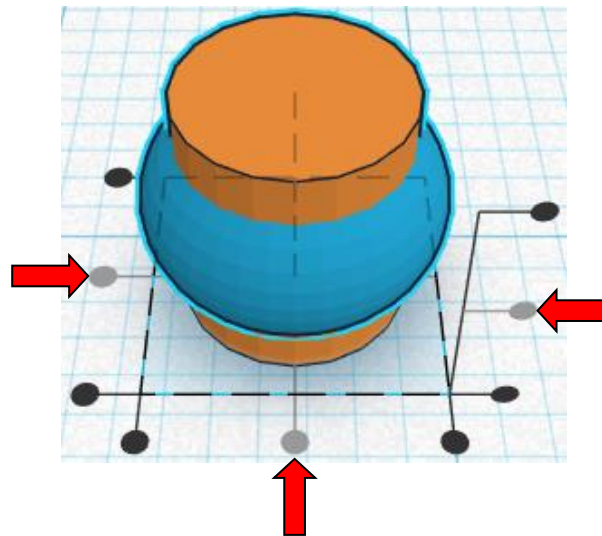
Bring in a Sphere, located in Basic Shapes on the center 2 shapes down.  
From now on this will be called the **Hip Cutout 2**.

Change the dimensions to  
6.5mm X direction,  
6.5mm Y direction, and  
5mm Z direction.



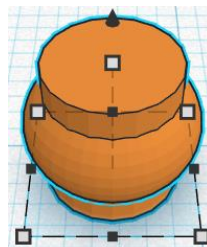
**Align** Hip Cutout 1 and Hip Cutout 2

centered in X direction,  
centered of Y direction, and  
centered of Z direction.



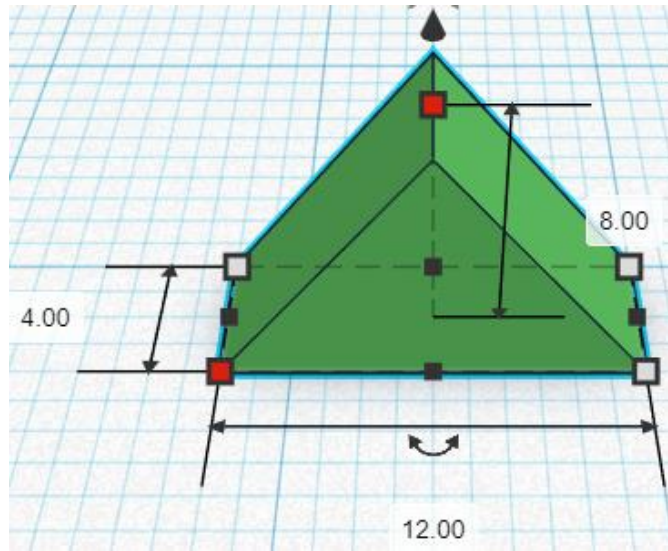
**Group** Hip Cutout 1 and Hip Cutout 2

From now on this will be called the **Hip Cutout**

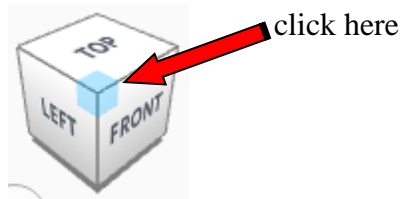


Bring in a Roof, located in Basic Shapes on the left 3 shapes down.  
From now on this will be called the **Hip Cutout 3**.

Change the dimensions to  
12mm X direction,  
4mm Y direction, and  
8mm Z direction.

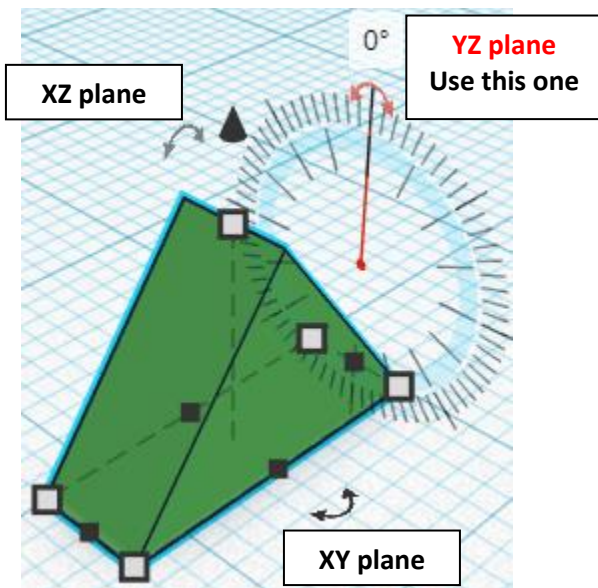


Go to TOP LEFT FRONT view for rotations

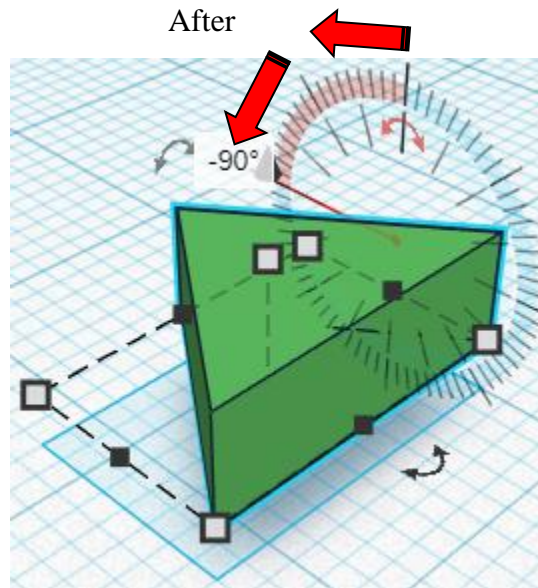


**Rotate** the Hip Cutout 3 counter-clockwise 90 degrees in YZ plane.

Before



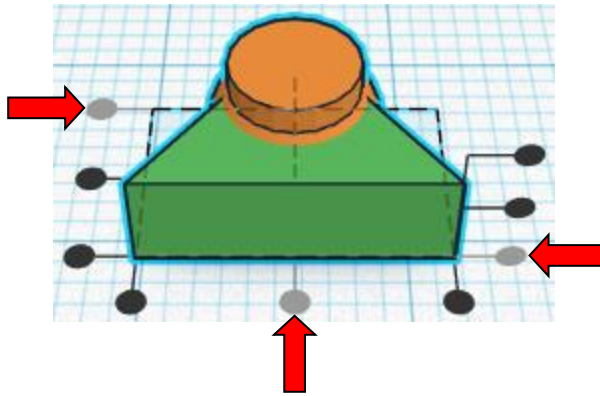
After





**Align Hip Cutout and Hip Cutout 3**

centered of X direction,  
back of Y direction, and  
bottom of Z direction.

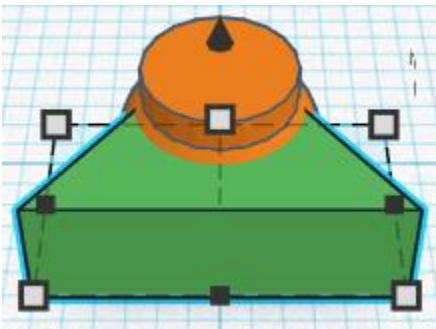


**Move Hip Cutout 3** (Must be in home view for this to work!)

move down in negative Y direction 2mm

**Hint:** Select Hip Cutout 3 and push down arrow key 2 times.

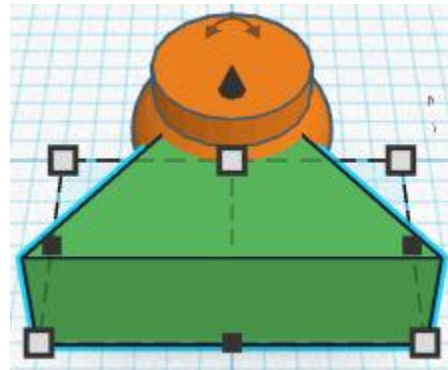
Before



2mm  
down

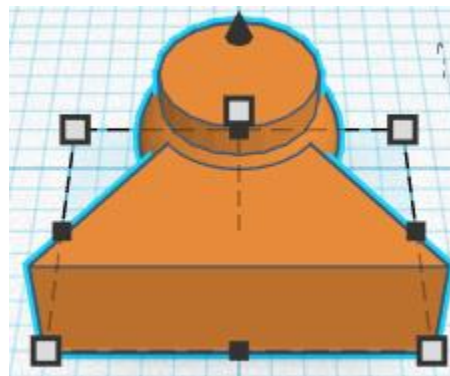


After



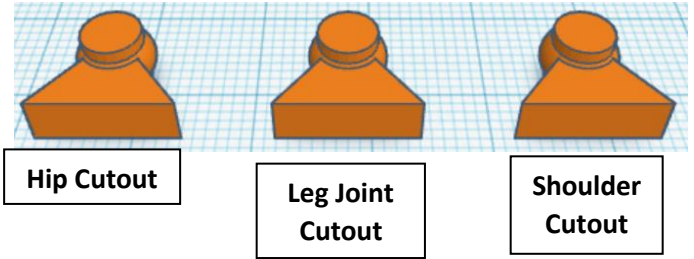
**Group Hip Cutout and Hip Cutout 3**

From now on this will be called the **Hip Cutout**



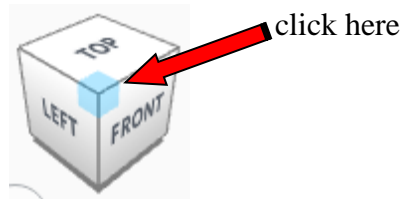


**Duplicate** Hip Cutout 2 time  
 From now on this will be called the **Leg Joint Cutout**  
 And  
 From now on this will be called the **Shoulder Cutout**



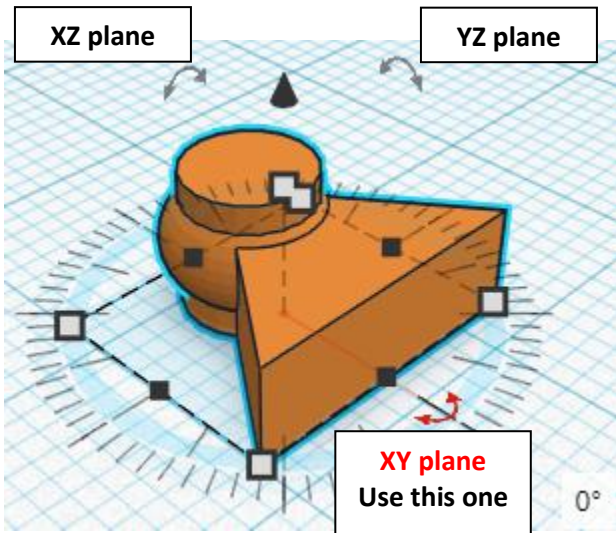
**Set the Leg Joint Cutout and Shoulder Cutout off to the side for now. They will get used later.**

Go to TOP LEFT FRONT view for rotations

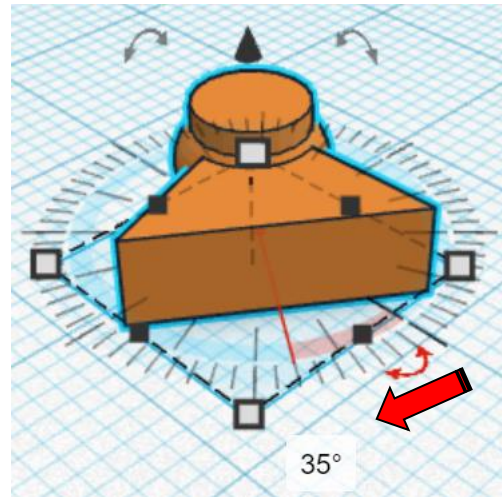


**Rotate** the Hip Cutout clockwise 35 degrees in XY plane.

Before



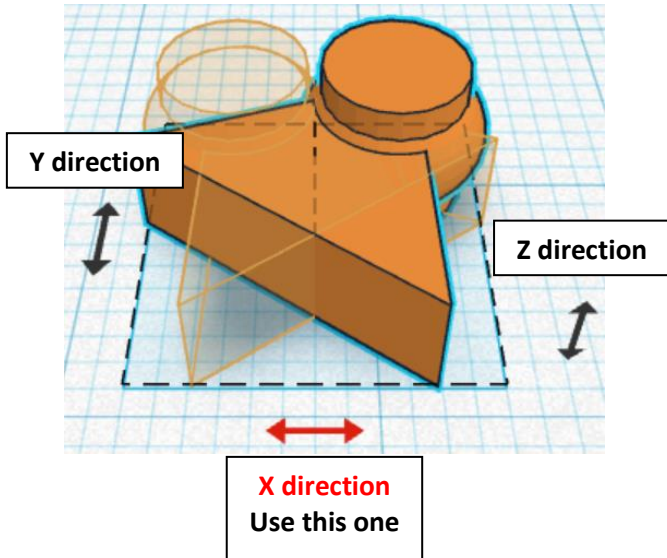
After



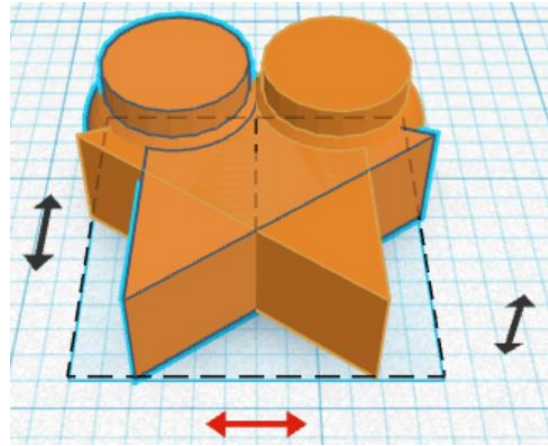
**Duplicate** Hip Cutout 1 time  
 From now on this will be called the **Right Hip Cutout**

**Flip Right Hip Cutout in X direction.**

Before



After



**Move Right Hip Cutout** (Must be in home view for this to work!)  
move right in positive X direction 15mm

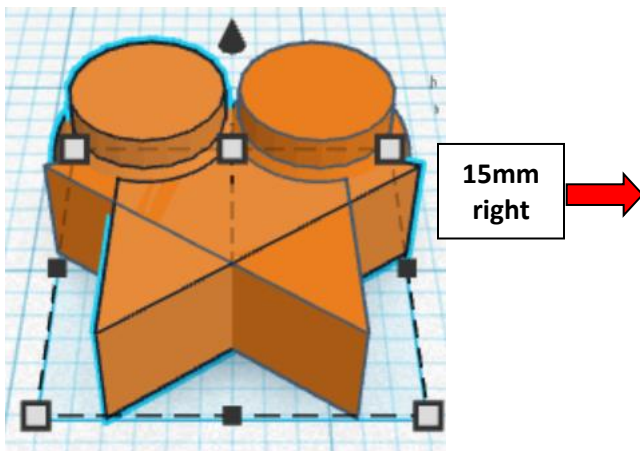
**Hint:** Select Right Hip Cutout and push right arrow key 15 times.

or

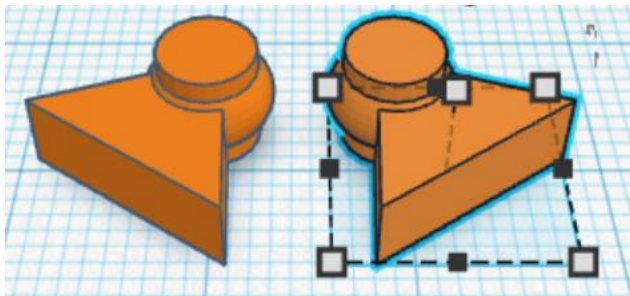
Select Right Hip Cutout and hold down shift and push right arrow key 1 time.

Then release shift and push right arrow key 5 more times.

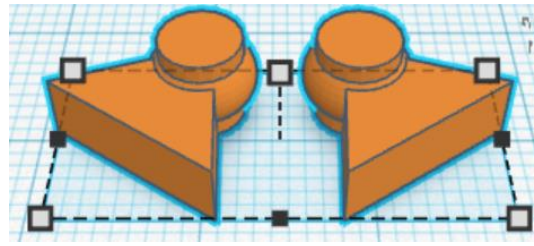
Before



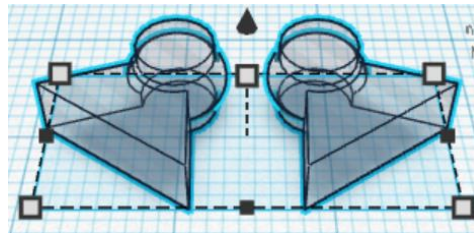
After



**Group Hip Cutout and Right Hip Cutout**  
From now on this will be called the **Hip Cutouts**

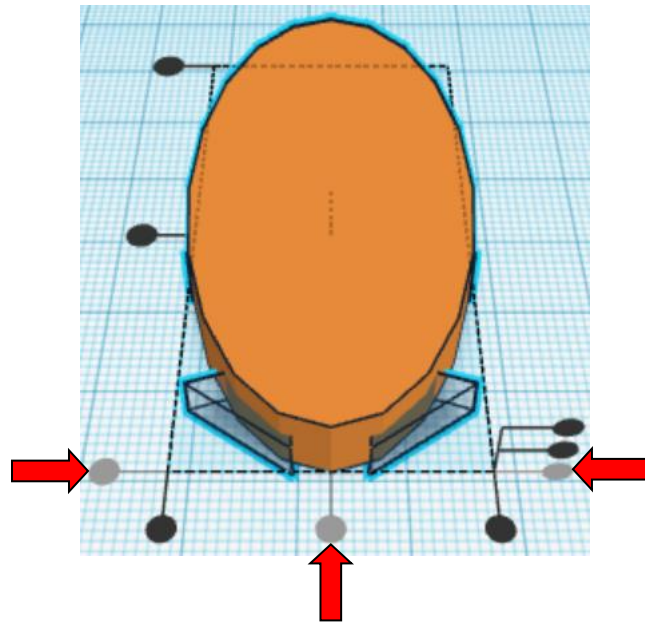


**Change Hip Cutouts to Hole**  
by selecting Hip Cutouts and typing “h”.



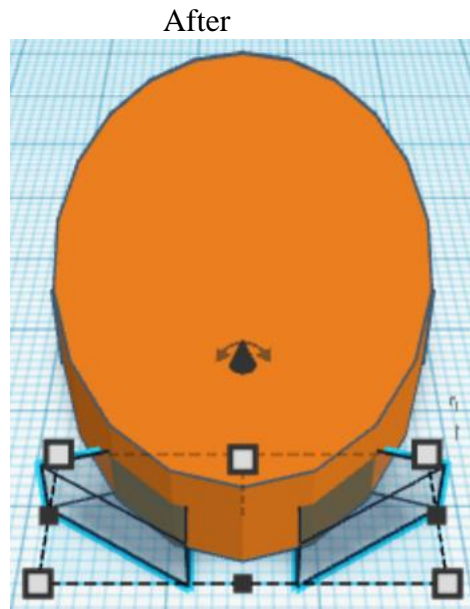
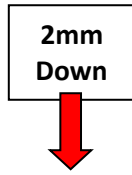
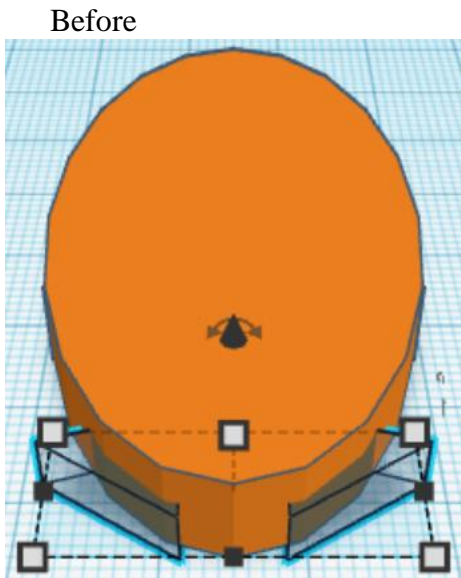
**Align Body and Hip Cutouts**

centered of X direction,  
front of Y direction, and  
bottom of Z direction.

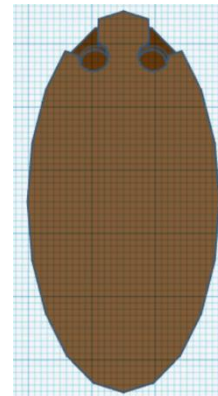
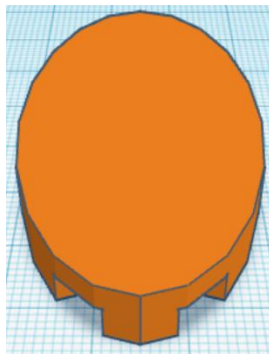


**Move Hip Cutouts** (Must be in home view for this to work!)  
move forward in negative Y direction 2mm

**Hint:** Select Hip Cutouts and push down arrow key 2 times.



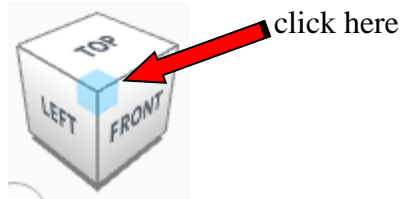
**Group Body and Hip Cutouts**  
From now on this will be called the **Body**



**Bottom  
view**



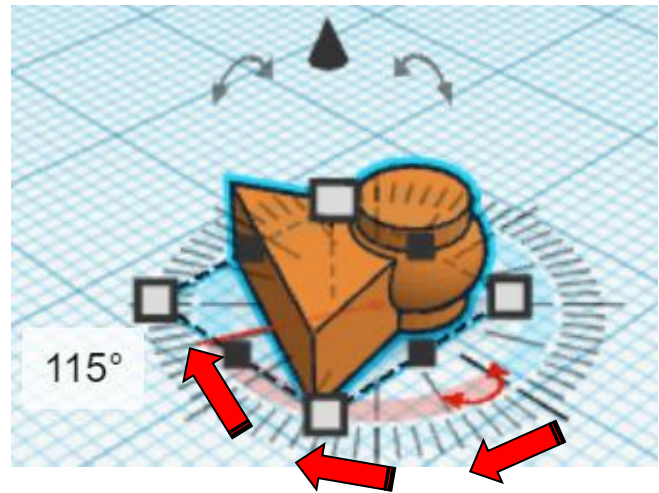
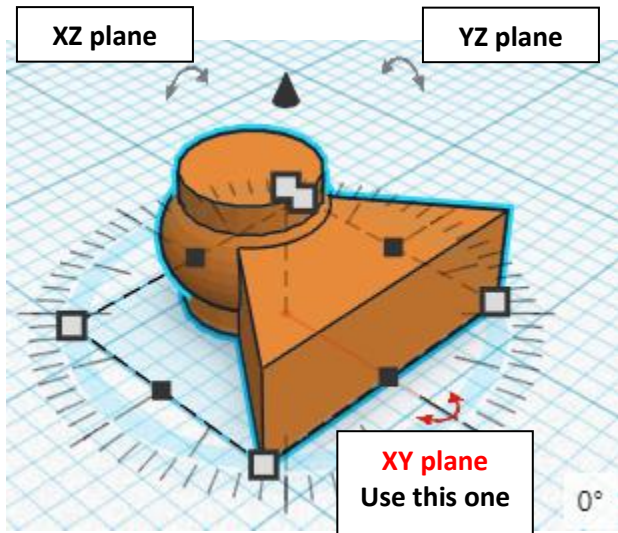
Go to TOP LEFT FRONT view for rotations



**Rotate** the Shoulder Cutout clockwise 115 degrees in XY plane.

Before

After



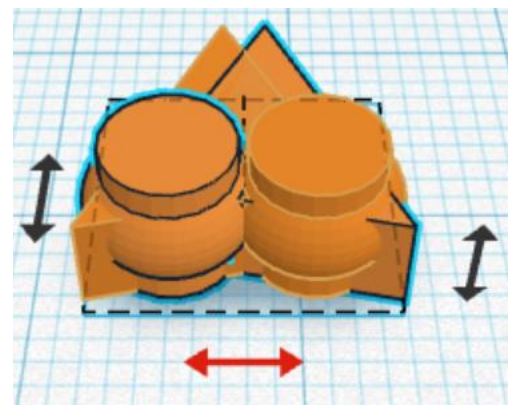
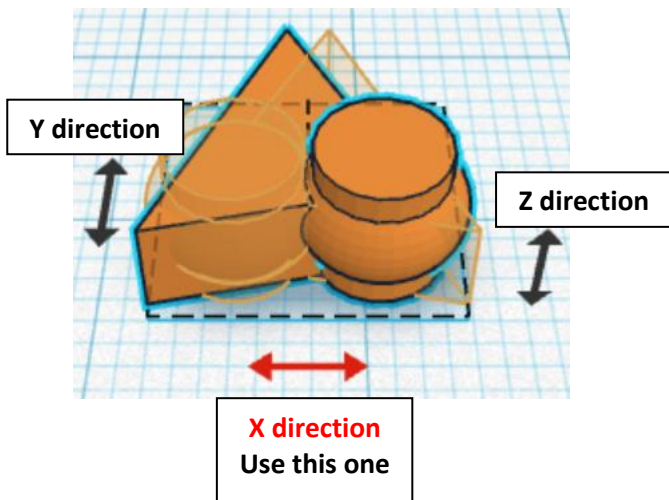
**Duplicate** Shoulder Cutout 1 time

From now on this will be called the **Right Shoulder Cutout**

**Flip** Right Shoulder Cutout in X direction.

Before

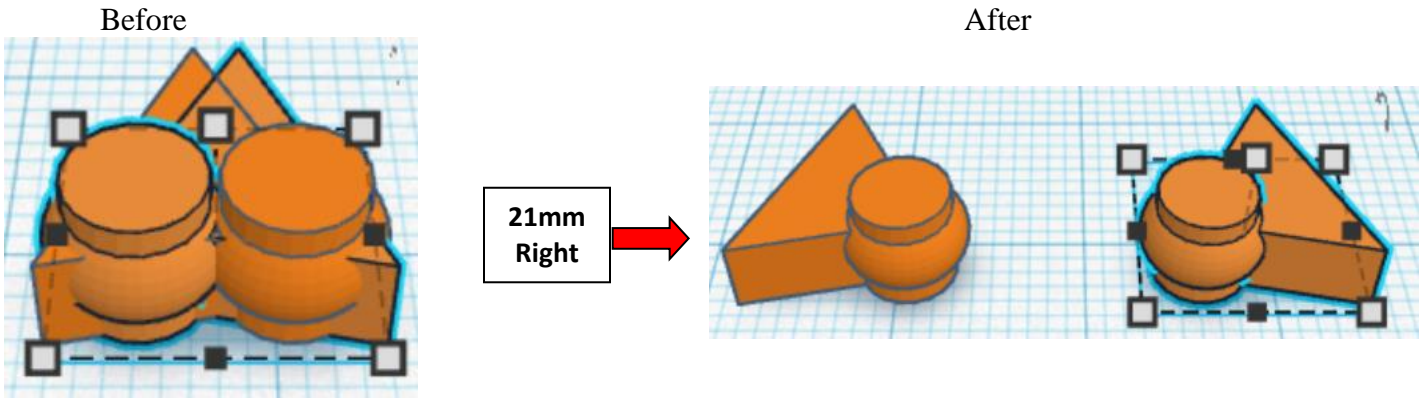
After



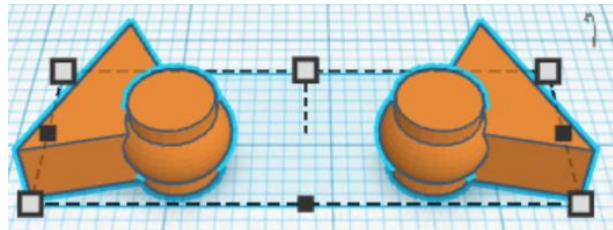


**Move Right Shoulder Cutout** (Must be in home view for this to work!)  
move right in positive X direction 21mm

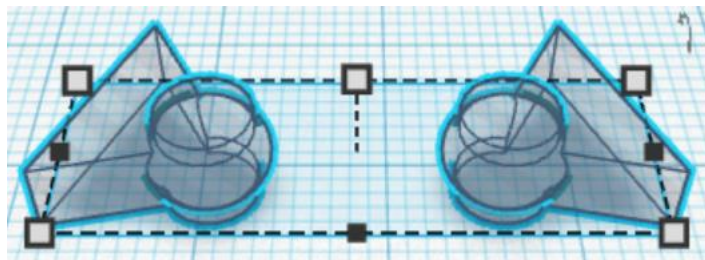
**Hint:** Select Right Shoulder Cutout and push right arrow key 21 times.  
or  
Select Right Shoulder Cutout and hold down shift and push right arrow key 2 time.  
Then release shift and push right arrow key 1 more times.



**Group Shoulder Cutout and Right Shoulder Cutout**  
From now on this will be called the **Shoulder Cutouts**

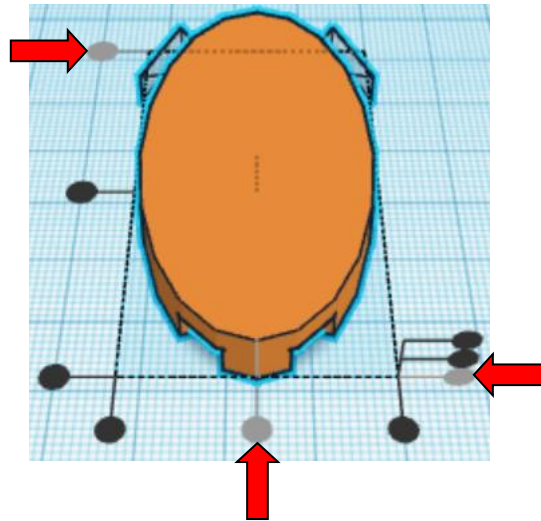


**Change Shoulder Cutouts to Hole**  
by selecting Shoulder Cutouts and typing "h".



**Align Body and Shoulder Cutouts**

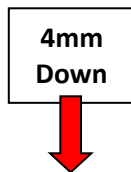
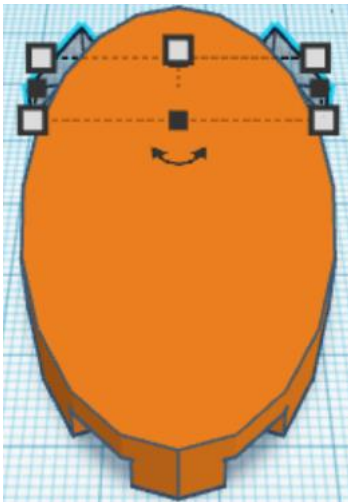
centered of X direction,  
back of Y direction, and  
bottom of Z direction.



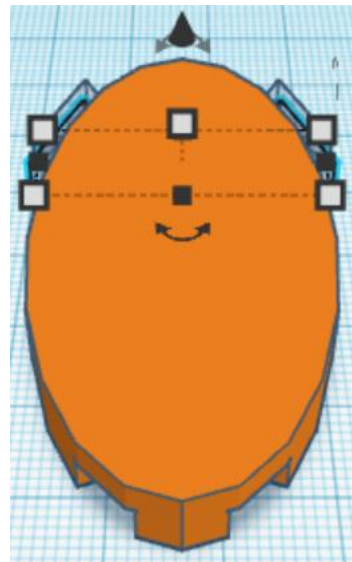
**Move Shoulder Cutouts** (Must be in home view for this to work!)  
move forward in negative Y direction 4mm

**Hint:** Select Shoulder Cutouts and push down arrow key 4 times.

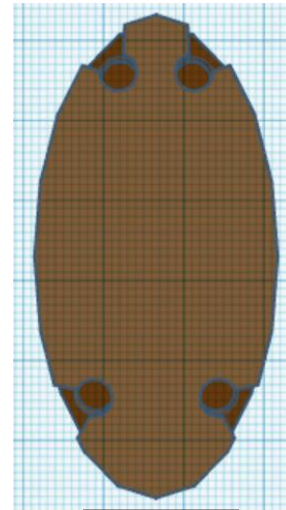
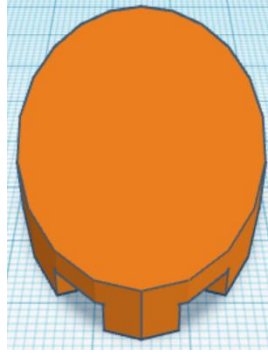
Before



After



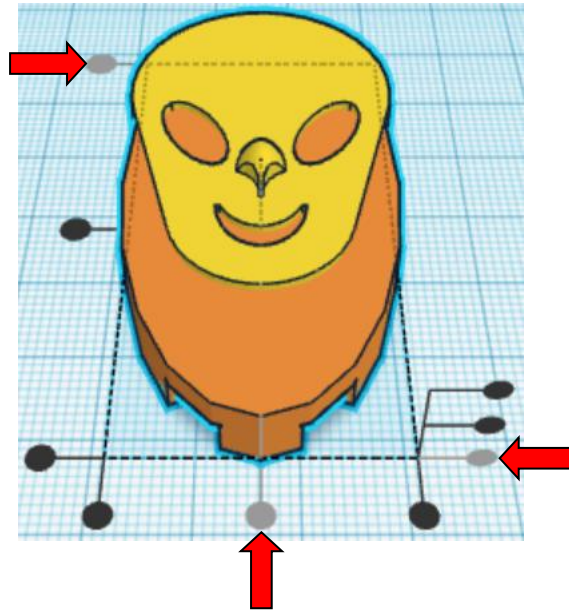
**Group Body and Shoulder Cutouts**  
From now on this will be called the **Body**



**Bottom view**

**Align Body and Head**

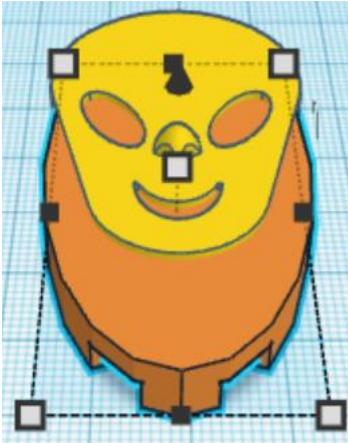
centered of X direction,  
back of Y direction, and  
bottom of Z direction.



**Move Body** (Must be in home view for this to work!)  
move down in negative Y direction 43mm

**Hint:** Select Body and push down arrow key 43 times.  
or  
Select Body and hold down shift and push down arrow key 4 time.  
Then release shift and push down arrow key 3 more times.

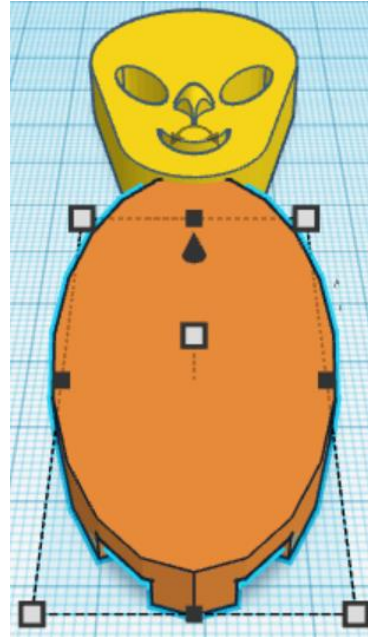
Before



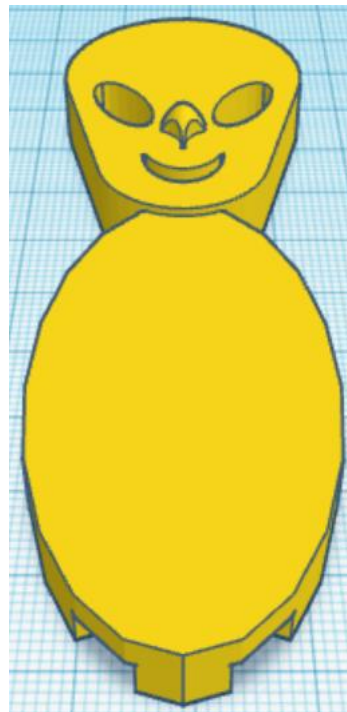
43mm  
Down

A red arrow pointing downwards, indicating the direction of the translation.

After



**Group Body and Head**  
From now on this will be called the **Body**

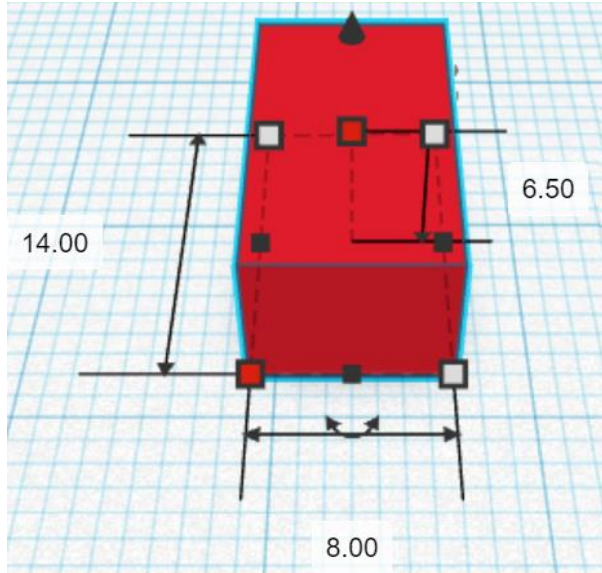




**Leg:**

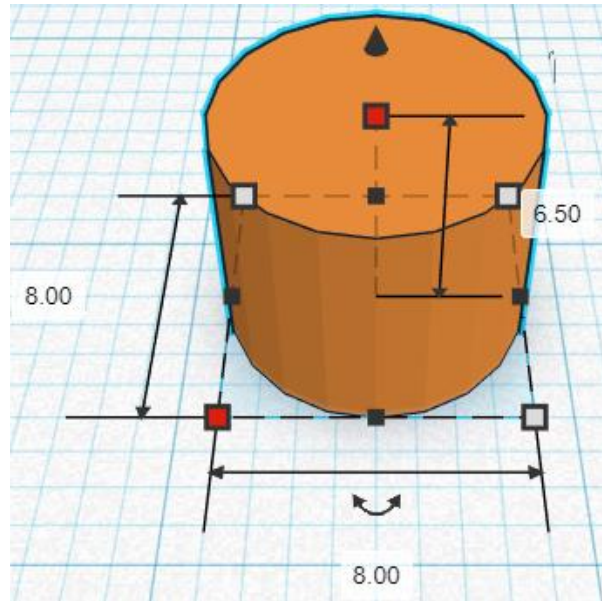
Bring in a Box, located in Basic Shapes on the right 1 shapes down.  
From now on this will be called the **Leg**.

Change the dimensions to  
8mm X direction,  
14mm Y direction, and  
6.5mm Z direction.



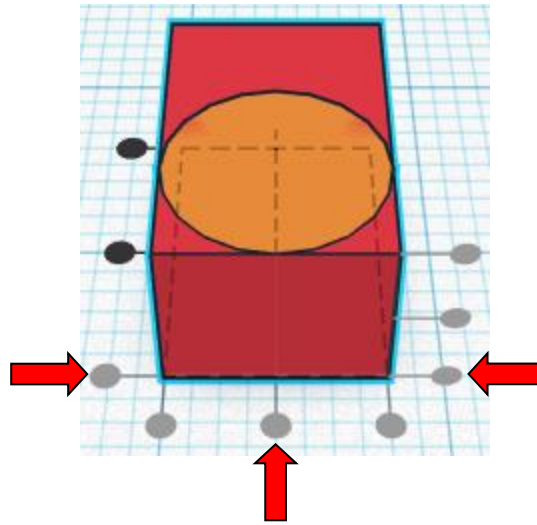
Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Leg Cylinder**.

Change the dimensions to  
8mm X direction,  
8mm Y direction, and  
6.5mm Z direction.



**Align Leg and Leg Cylinder**

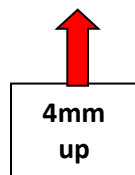
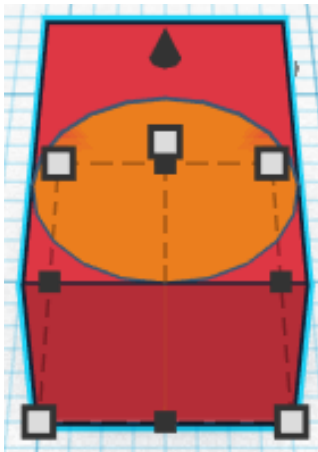
centered of X direction,  
front of Y direction, and  
bottom of Z direction.



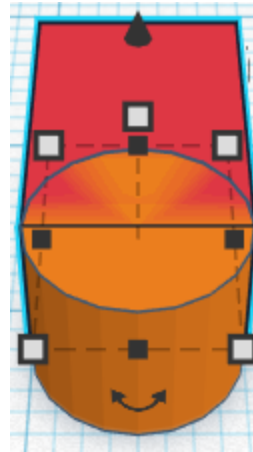
**Move Leg** (Must be in home view for this to work!)  
move up in positive Y direction 4mm

**Hint:** Select Leg and push up arrow key 4 times.

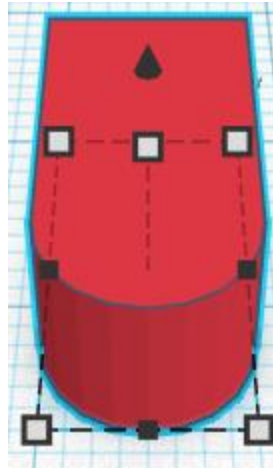
Before



After

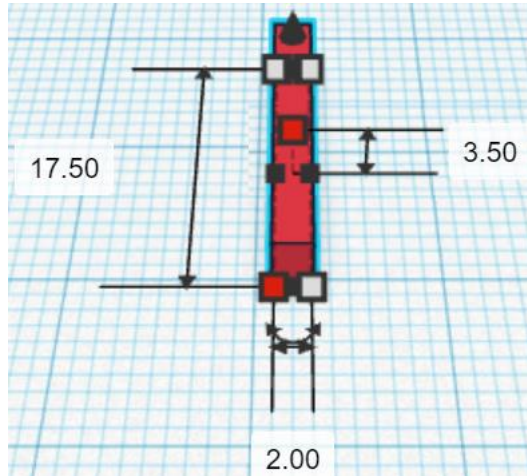


**Group Leg and Leg Cylinder**  
From now on this will be called the **Leg**



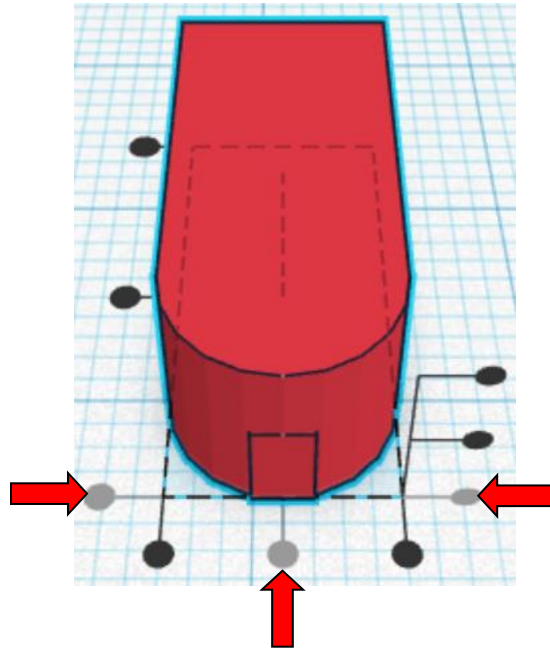
Bring in a Box, located in Basic Shapes on the right 1 shapes down.  
From now on this will be called the **Leg Joint**.

Change the dimensions to  
2mm X direction,  
17.5mm Y direction, and  
3.5mm Z direction.



**Align Leg and Leg Joint**

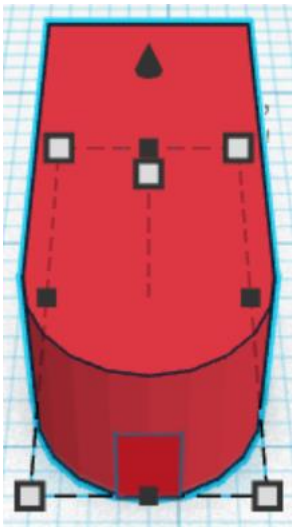
centered of X direction,  
front of Y direction, and  
bottom of Z direction.




**Move Leg** (Must be in home view for this to work!)  
move down in negative Y direction 7mm

**Hint:** Select Leg and push down arrow key 7 times.

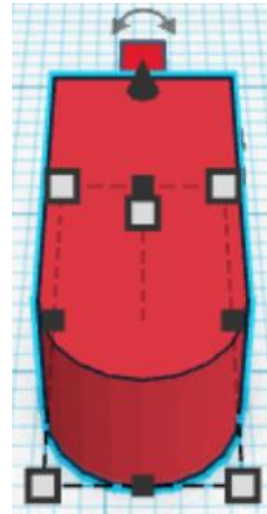
Before



7mm  
down



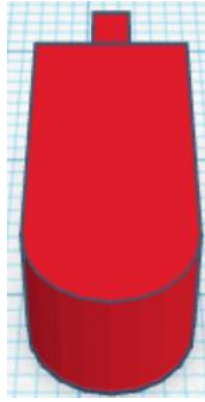
After





**Group Leg and Leg Joint**

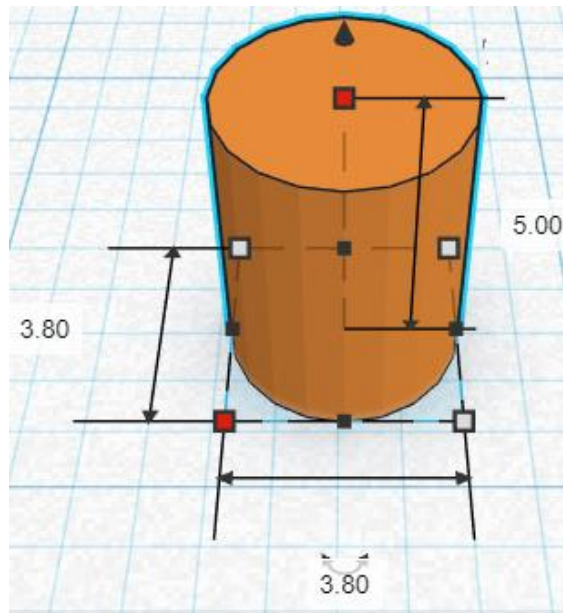
From now on this will be called the **Leg**



Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.

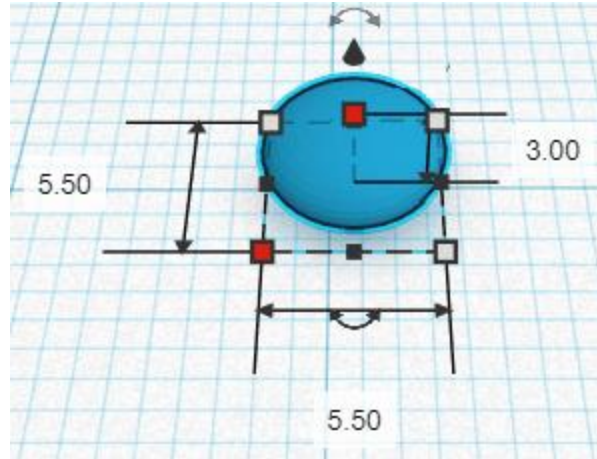
From now on this will be called the **Leg Joint Cylinder**.

Change the dimensions to  
3.8mm X direction,  
3.8mm Y direction, and  
5mm Z direction.



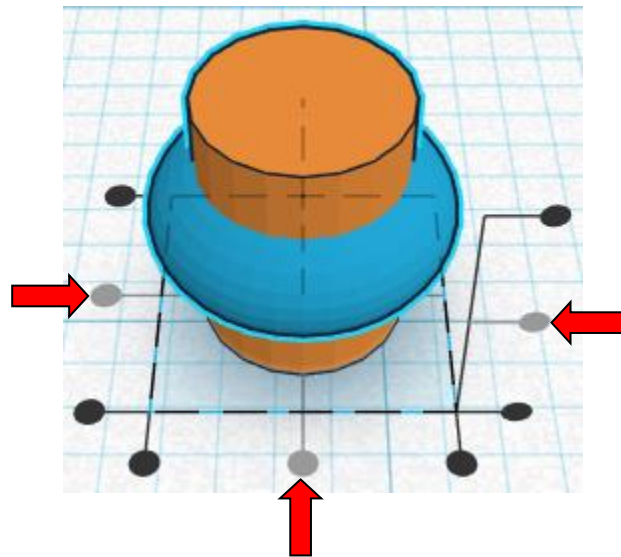
Bring in a Sphere, located in Basic Shapes on the center 2 shapes down.  
From now on this will be called the **Leg Joint Sphere**.

Change the dimensions to  
5.5mm X direction,  
5.5mm Y direction, and  
3mm Z direction.

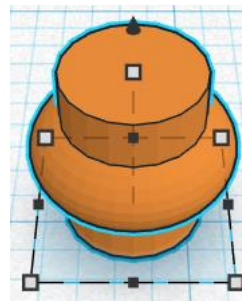


**Align** Leg Joint Cylinder and Leg Joint Sphere

centered in X direction,  
centered of Y direction, and  
centered of Z direction.

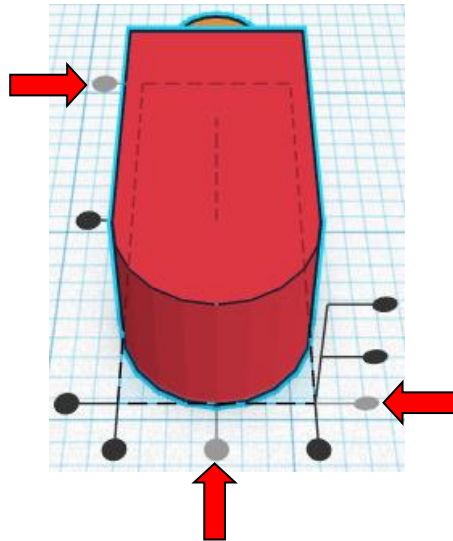


**Group** Leg Joint Cylinder and Leg Joint Sphere  
From now on this will be called the **Leg Joint Top**



**Align Leg and Leg Joint Top**

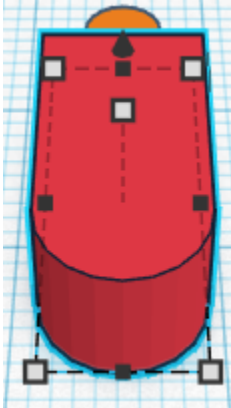
centered in X direction,  
back of Y direction, and  
bottom of Z direction.




**Move Leg** (Must be in home view for this to work!)  
move down in negative Y direction 2mm

**Hint:** Select Leg and push down arrow key 2 times.

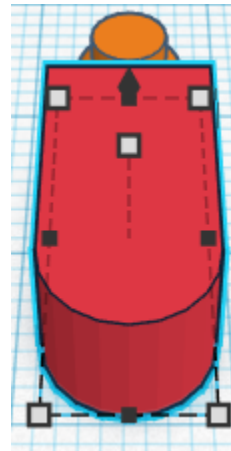
Before



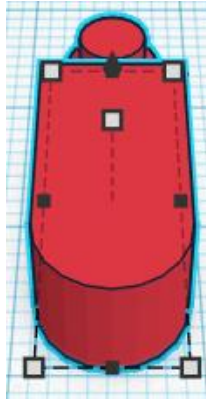
2mm  
down



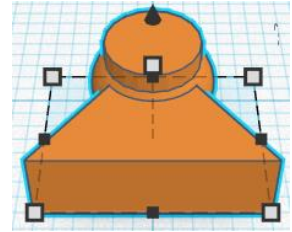
After



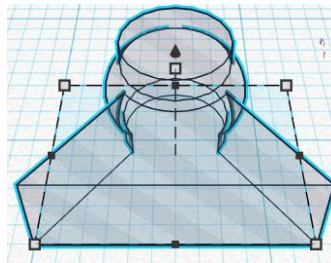
**Group Leg and Leg Joint Top**  
From now on this will be called the **Leg**



Remember the Leg Joint Cutout back on page 19 that was set aside?

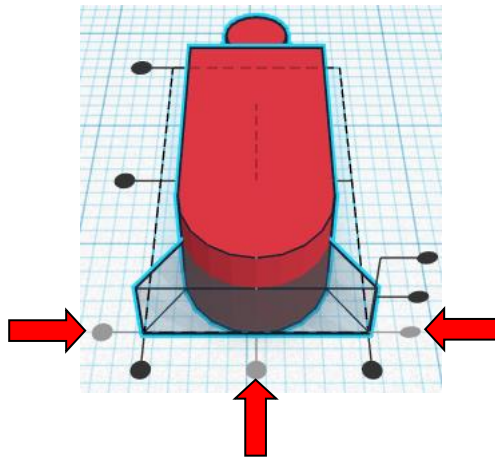


**Change Leg Joint Cutout to Hole**  
by selecting Leg Joint Cutout and typing "h".



**Align Leg and Leg Joint Cutout**

centered in X direction,  
front of Y direction, and  
bottom of Z direction.

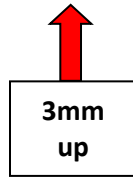
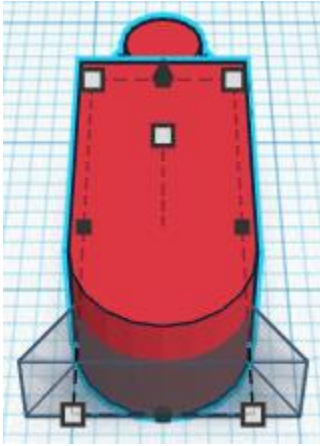




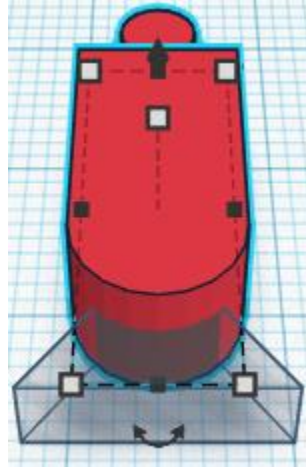
**Move Leg** (Must be in home view for this to work!)  
move up in positive Y direction 3mm

**Hint:** Select Leg and push up arrow key 3 times.

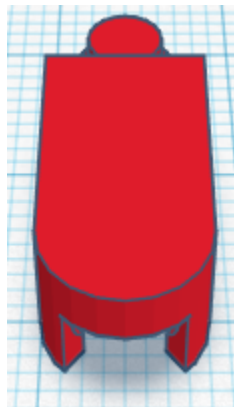
Before



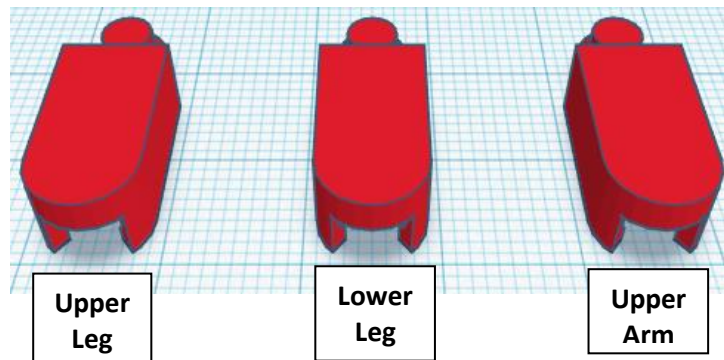
After



**Group Leg and Leg Joint Cutout**  
From now on this will be called the **Leg**

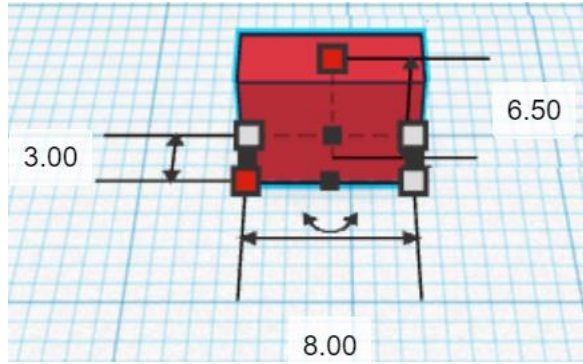


**Duplicate Leg 2 times**  
From now on this will be called  
the **Upper Leg, Lower Leg, & Upper Arm**



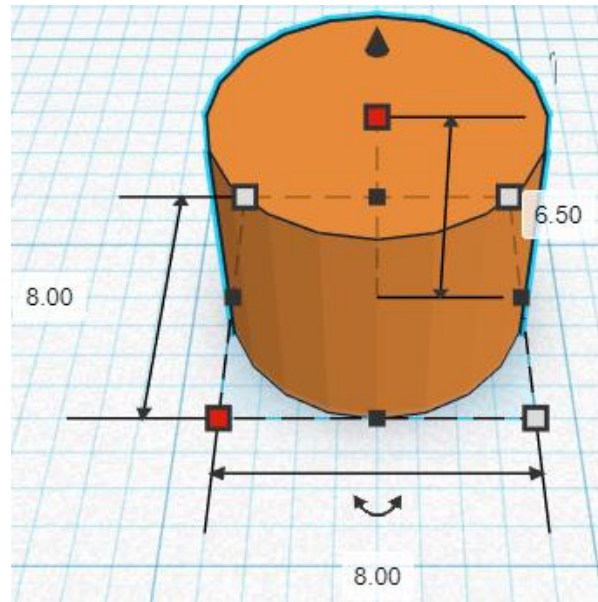
Bring in a Box, located in Basic Shapes on the right 1 shapes down.  
From now on this will be called the **Lower Leg Extension**.

Change the dimensions to  
8mm X direction,  
3mm Y direction, and  
6.5mm Z direction.

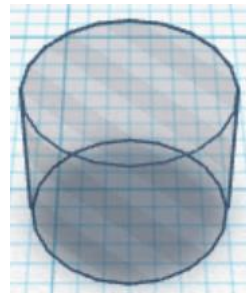


Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Lower Leg Extension Cutout**.

Change the dimensions to  
8mm X direction,  
8mm Y direction, and  
6.5mm Z direction.

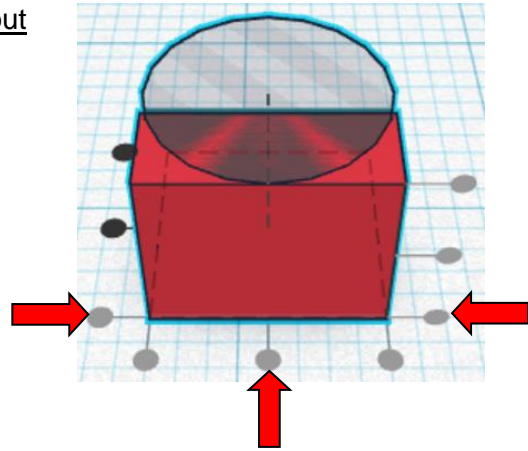


**Change Lower Leg Extension Cutout to **Hole****  
by selecting Lower Leg Extension Cutout and typing "h".



**Align Lower Leg Extension and Lower Leg Extension Cutout**

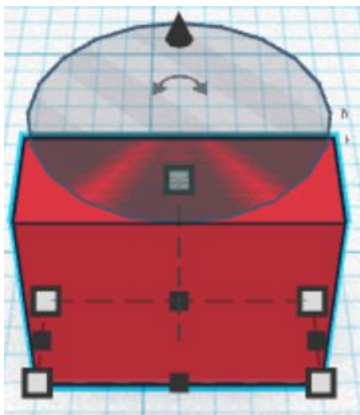
centered in X direction,  
front of Y direction, and  
bottom of Z direction.




**Move Lower Leg Extension** (Must be in home view for this to work!)  
move down in negative Y direction 1mm

**Hint:** Select Lower Leg Extension and push down arrow key 1 times.

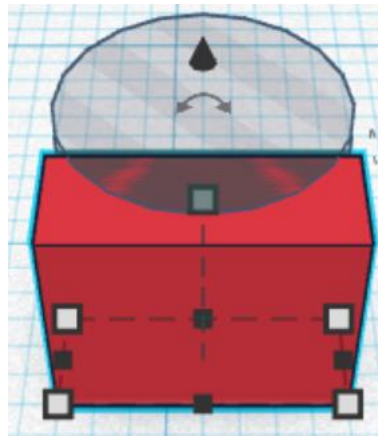
Before



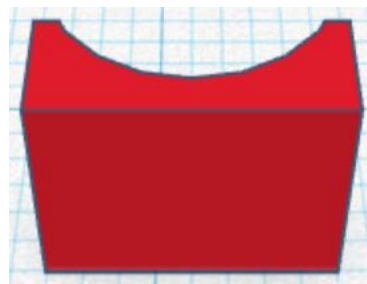
1mm  
down



After

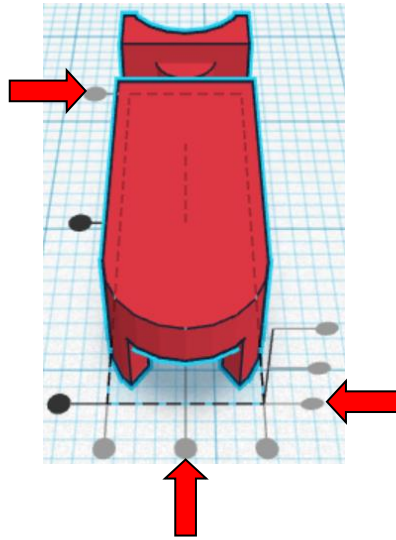


**Group Lower Leg Extension and Lower Leg Extension Cutout**  
From now on this will be called the **Lower Leg Extension**



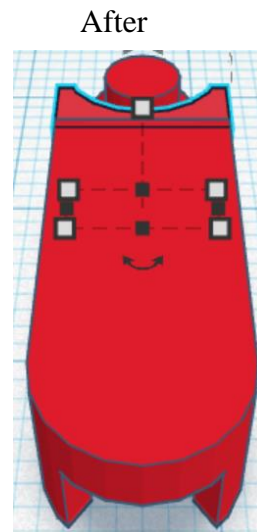
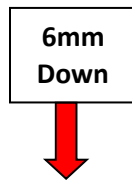
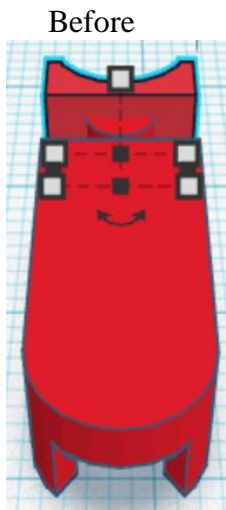
**Align** Lower Leg Extension and Lower Leg

centered in X direction,  
back of Y direction, and  
bottom of Z direction.



**Move** Lower Leg Extension (Must be in home view for this to work!)  
move down in negative Y direction 6mm

**Hint:** Select Lower Leg Extension and push down arrow key 6 times.

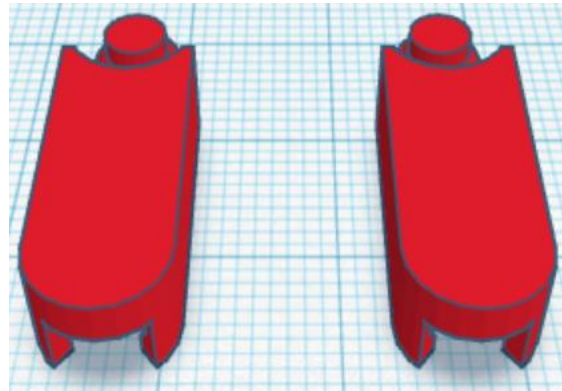


**Group** Lower Leg Extension and Lower Leg  
From now on this will be called the **Lower Leg**





**Duplicate Lower Leg 1 times**  
From now on this will be called the **Lower Leg, & Lower Arm**



Lower Leg

Lower Arm

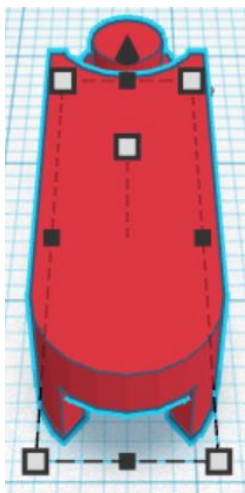
Set Lower Arm off to the side

**Duplicate Lower Leg 1 times**  
From now on this will be called the **Lower Leg 2**

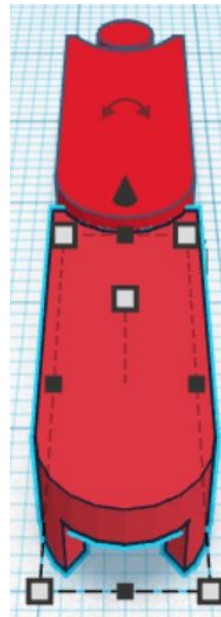
**Move Lower Leg 2** (Must be in home view for this to work!)  
move down in negative Y direction 20mm

**Hint:** Select Lower Leg 2 and push down arrow key 20 times.  
or  
Select Lower Leg 2 and hold down shift and push down arrow key 2 time.  
Then release shift and push down arrow key 3 more times.

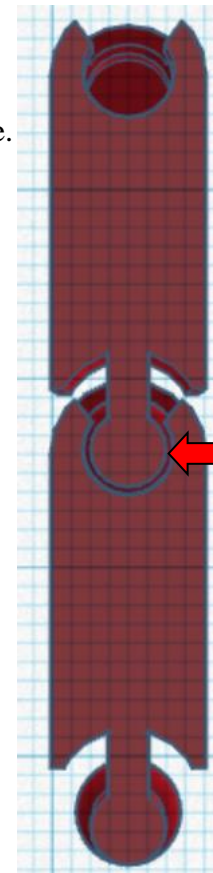
Before



After

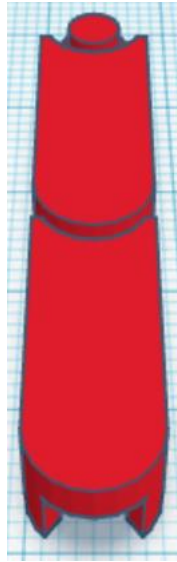


20mm  
Down



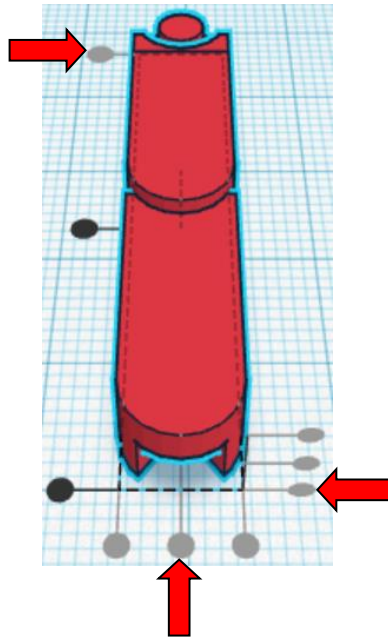
Bottom View  
(should be centered in socket)

**Group Lower Leg and Lower Leg 2**  
From now on this will be called the **Lower Leg**



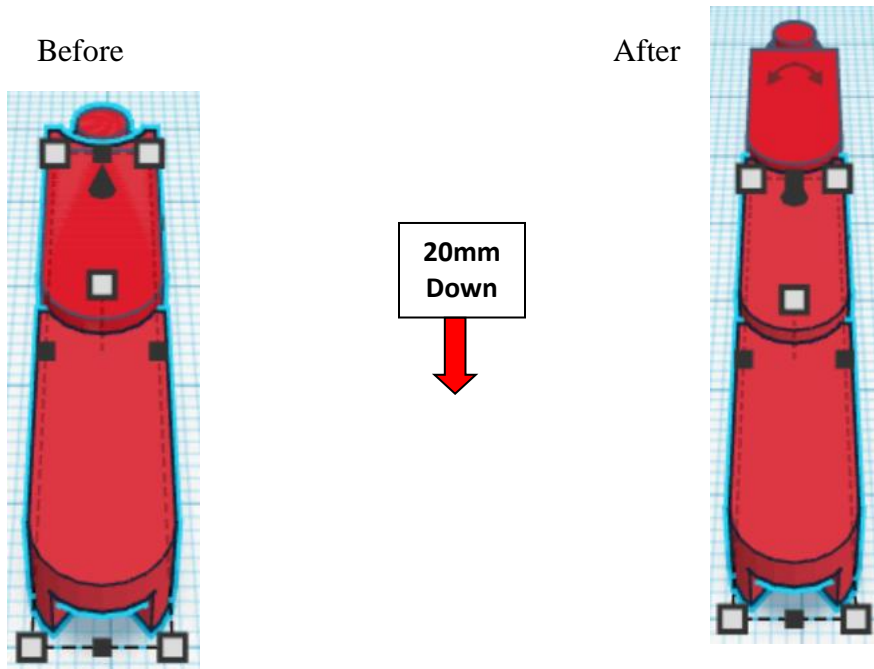
**Align Lower Leg and Upper Leg**

centered in X direction,  
back of Y direction, and  
bottom of Z direction.



**Move Lower Leg** (Must be in home view for this to work!)  
move down in negative Y direction 20mm

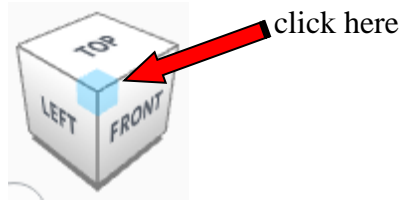
**Hint:** Select Lower Leg and push down arrow key 20 times.  
or  
Select Lower Leg and hold down shift and push down arrow key 2 time.



**Group Lower Leg and Upper Leg**  
From now on this will be called the **Leg**

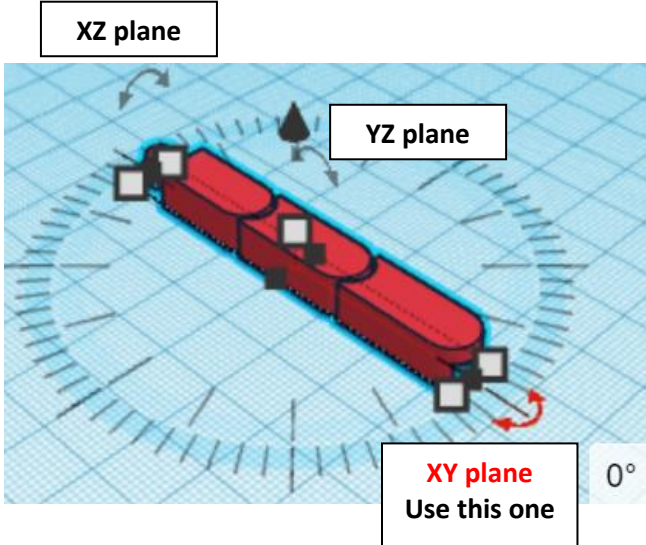


Go to TOP LEFT FRONT view for rotations

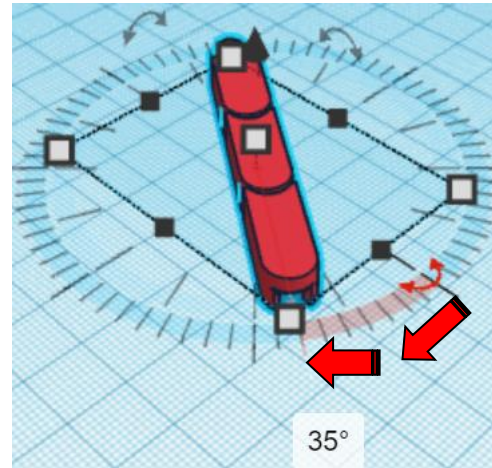


**Rotate** the Leg clockwise 35 degrees in XY plane.

Before

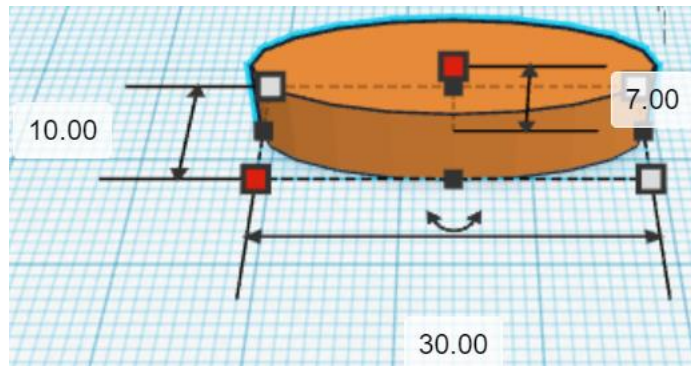


After



Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Foot**.

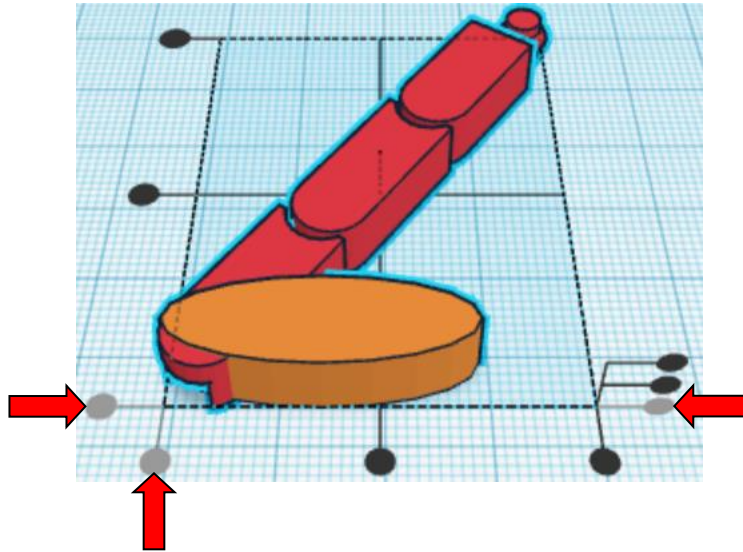
Change the dimensions to  
30mm X direction,  
10mm Y direction, and  
7mm Z direction.





**Align Leg and Foot**

left in X direction,  
front of Y direction, and  
bottom of Z direction.

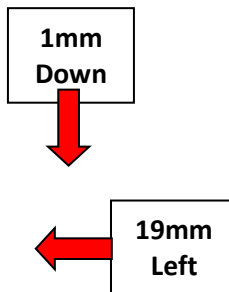
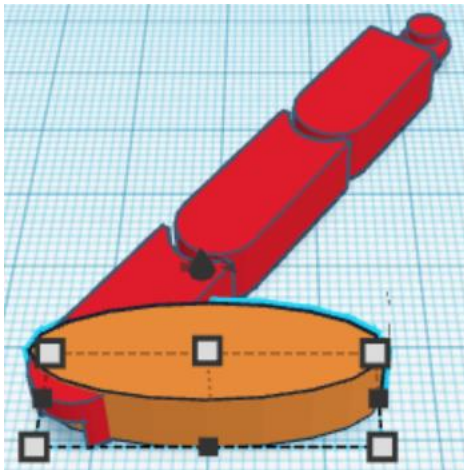


**Move Foot** (Must be in home view for this to work!)

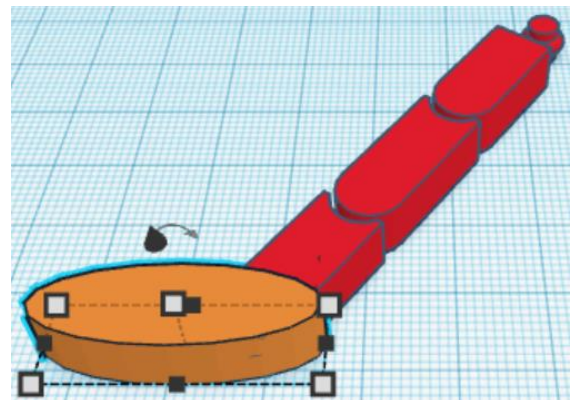
move down in negative Y direction 1mm  
and  
move left in negative X direction 19mm

**Hint:** Select Foot and push down arrow key 1 time.  
And  
Select Foot and push left arrow key 19 time.  
Or  
Select Foot and push down arrow key 1 time.  
And  
Select Foot and hold down shift and push left arrow key 1 time.  
Then release shift and push left arrow key 9 more times.

Before

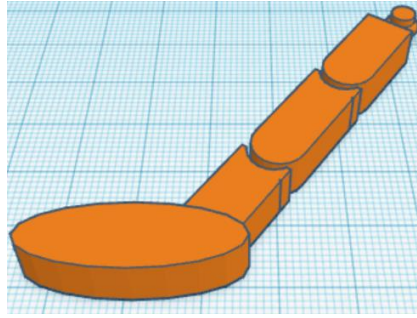


After



**Group Leg and Foot**

From now on this will be called the **Leg**

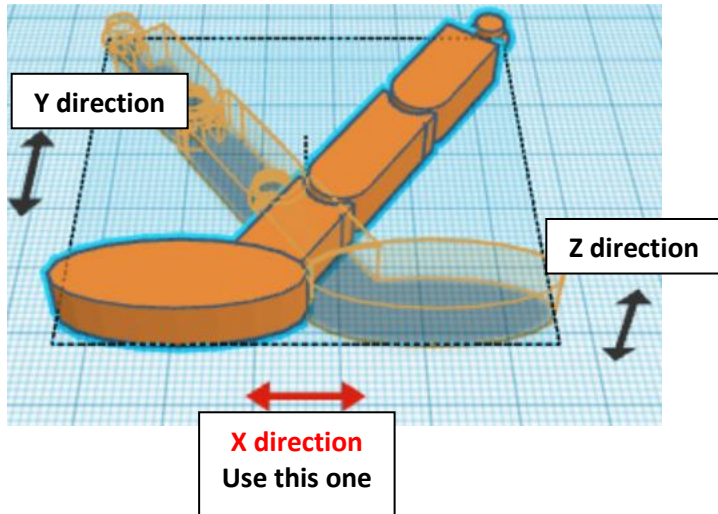


**Duplicate Leg 1 time**

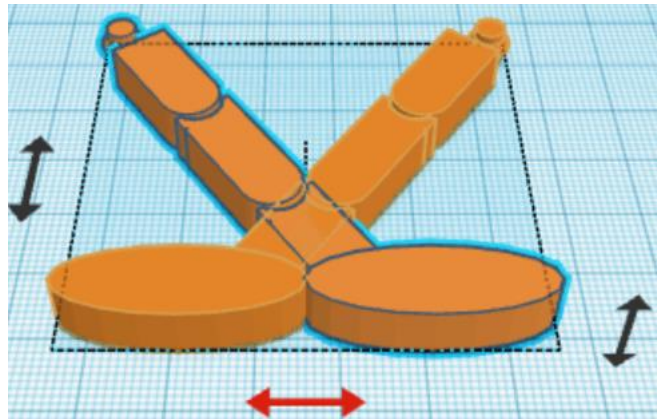
From now on this will be called the **Right Leg**

**Flip Right Leg in X direction.**

Before

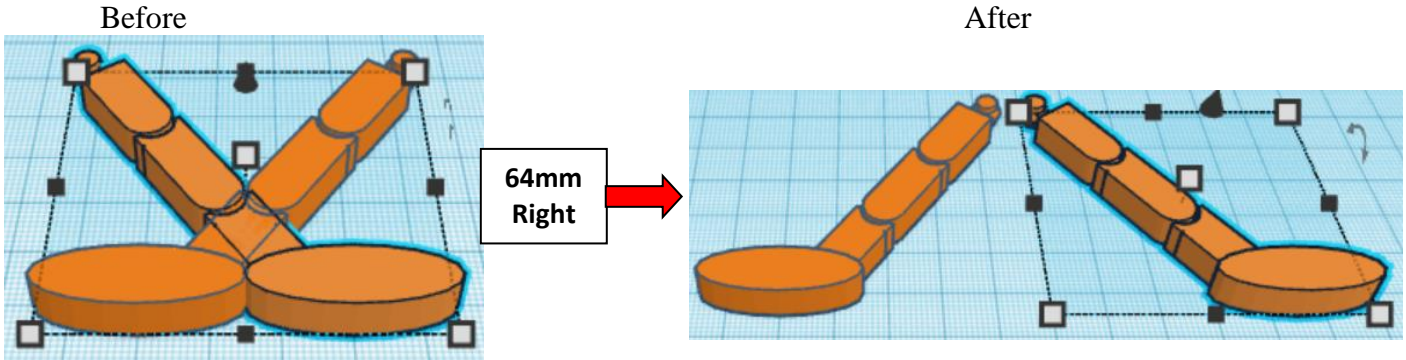


After

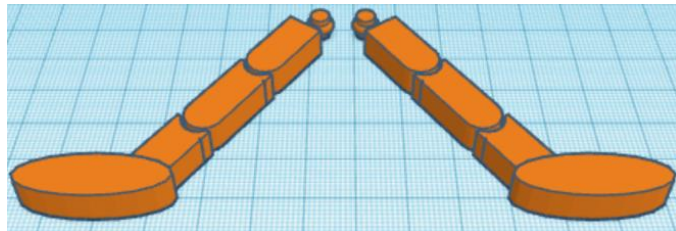


**Move Right Leg** (Must be in home view for this to work!)  
move right in positive X direction 64mm

**Hint:** Select Right Leg and push right arrow key 64 times.  
or  
Select Right Leg and hold down shift and push right arrow key 6 time.  
Then release shift and push right arrow key 4 more times.

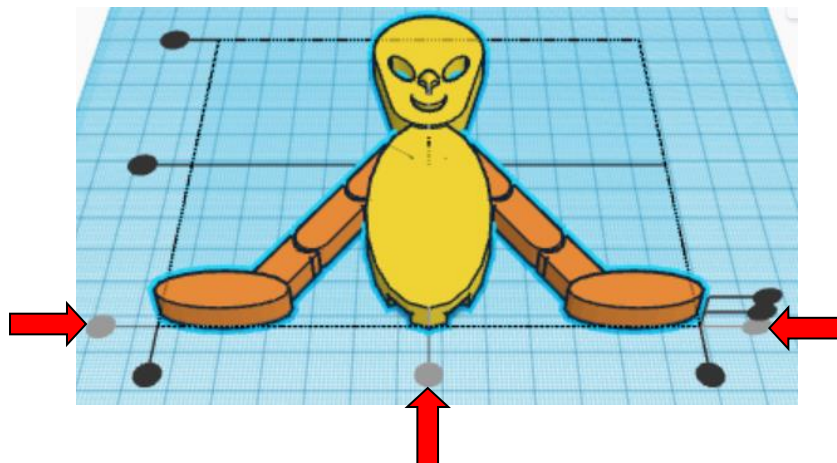


**Group Leg and Right Leg**  
From now on this will be called the **Legs**



**Align Legs and Body**

centered in X direction,  
front of Y direction, and  
bottom of Z direction.

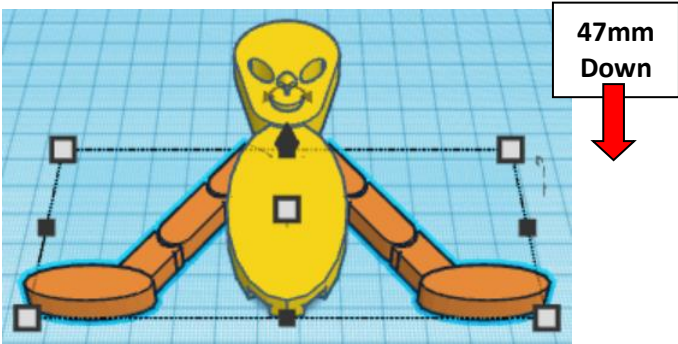




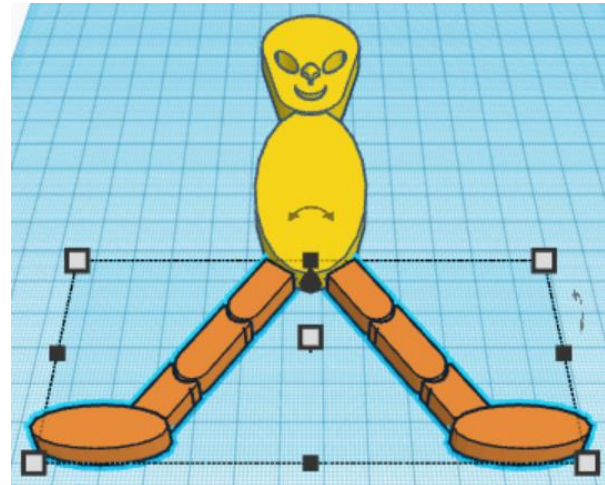
**Move Legs** (Must be in home view for this to work!)  
move down in negative Y direction 47mm

**Hint:** Select Legs and push down arrow key 47 time.  
Or  
Select Legs and hold down shift and push down arrow key 4 time.  
Then release shift and push left arrow key 7 more times.

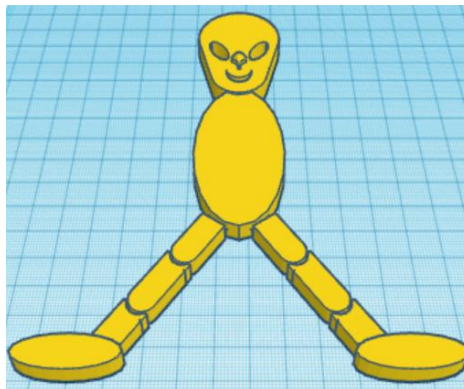
Before



After



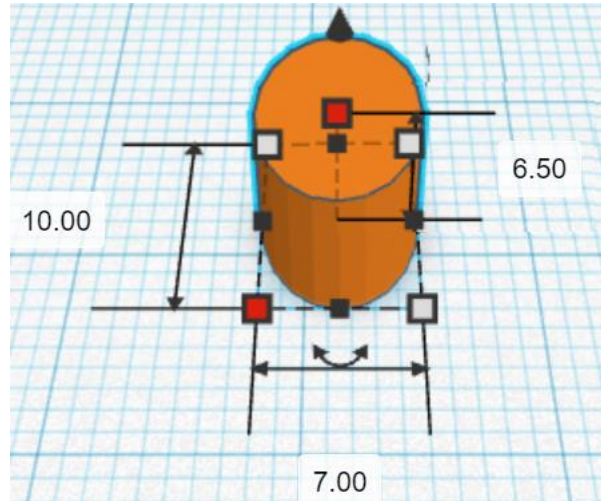
**Group** Legs and Body  
From now on this will be called the **Alien**



## Hand:

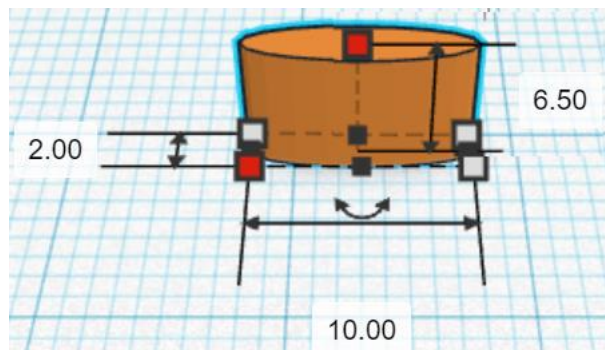
Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Hand**.

Change the dimensions to  
7mm X direction,  
10mm Y direction, and  
6.5mm Z direction.



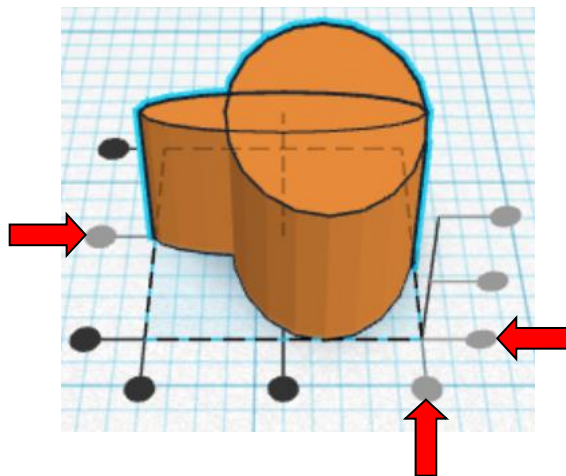
Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Thumb**.

Change the dimensions to  
10mm X direction,  
2mm Y direction, and  
6.5mm Z direction.



## Align Hand and Thumb

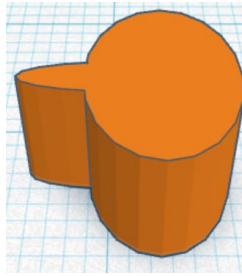
right in X direction,  
centered of Y direction, and  
bottom of Z direction.





**Group Hand and Thumb**

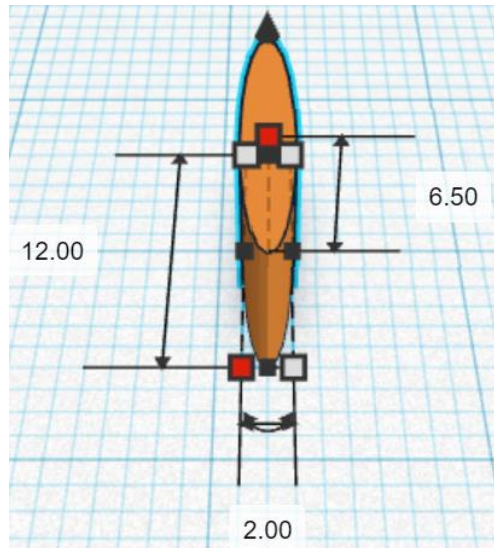
From now on this will be called the **Hand**



Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.

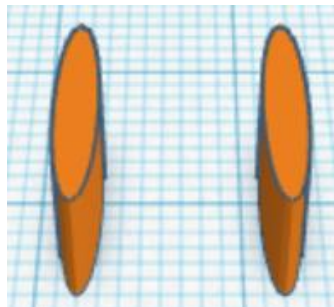
From now on this will be called the **Finger 1**.

Change the dimensions to  
2mm X direction,  
12mm Y direction, and  
6.5mm Z direction.



**Duplicate Finger 1 1 time**

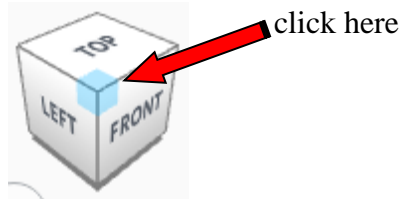
From now on this will be called the **Finger 2**



**Finger 1**

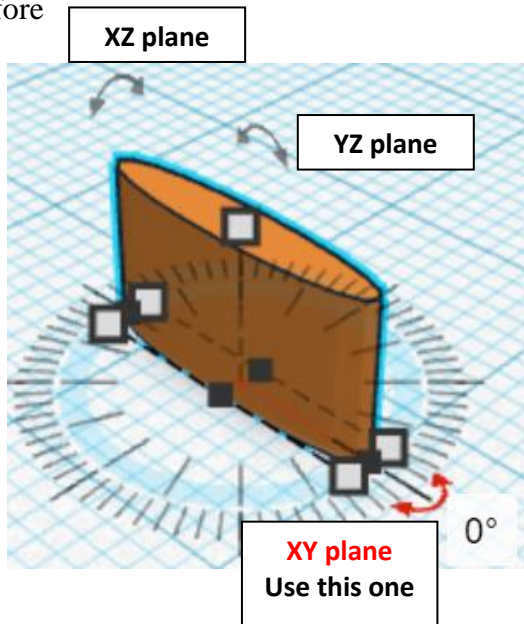
**Finger 2**

Go to TOP LEFT FRONT view for rotations

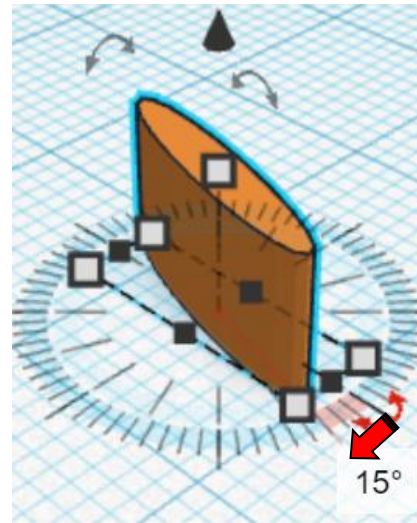


**Rotate** the Finger 2 clockwise 15 degrees in XY plane.

Before



After

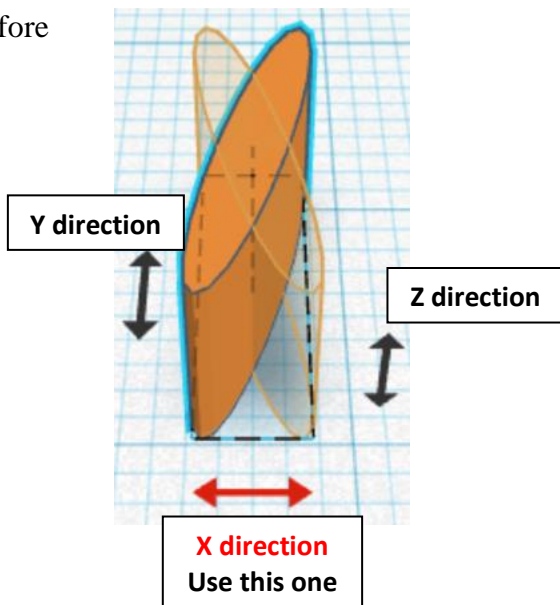


**Duplicate** Finger 2 1 time

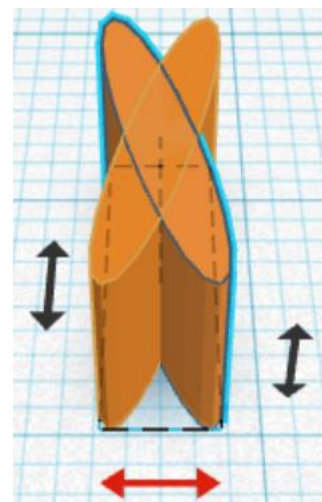
From now on this will be called the **Finger 3**

**Flip** Finger 3 in X direction.

Before



After



**Move Finger 3** (Must be in home view for this to work!)  
move right in positive X direction 4mm

**Hint:** Select Finger 3 and push right arrow key 4 times.

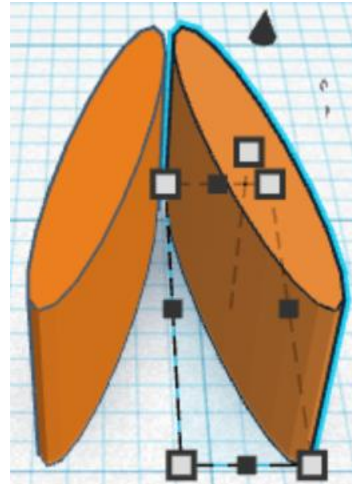
Before



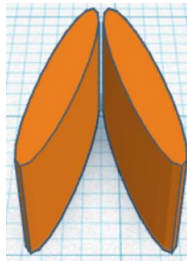
4mm  
Right



After

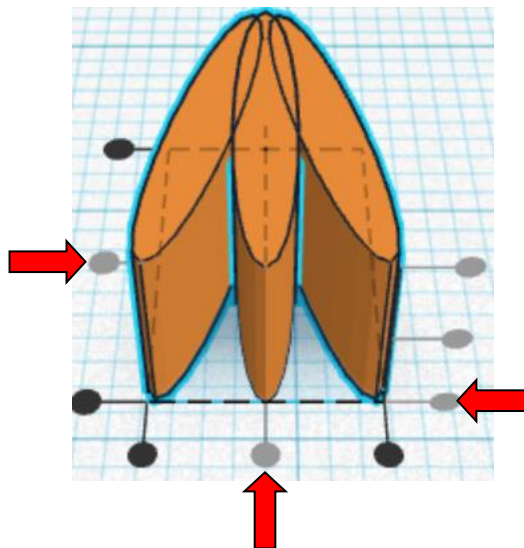


**Group Finger 2 and Finger 3**  
From now on this will be called the **Fingers 2 & 3**



**Align Finger 1 and Fingers 2 & 3**

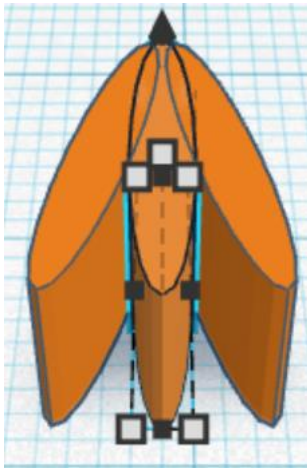
centered in X direction,  
centered of Y direction, and  
bottom of Z direction.



**Move Finger 1** (Must be in home view for this to work!)  
move down in negative Y direction 2mm

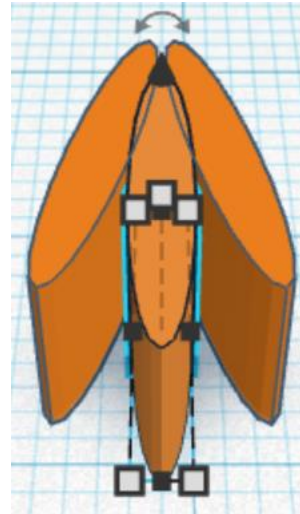
**Hint:** Select Finger 1 and push down arrow key 2 times.

Before

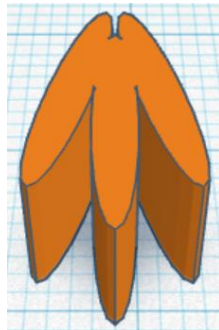


2mm  
Down

After

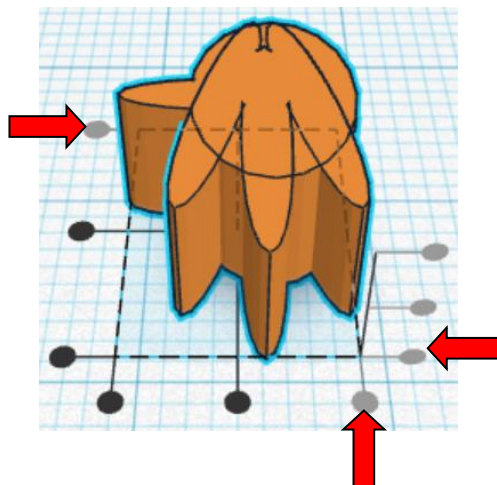


**Group Finger 1 and Fingers 2 & 3**  
From now on this will be called the **Fingers**



**Align Hand and Fingers**

right in X direction,  
back of Y direction, and  
bottom of Z direction.

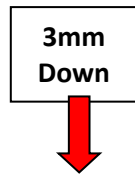
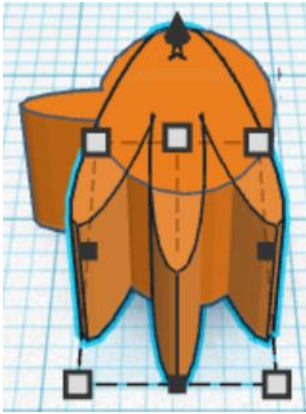




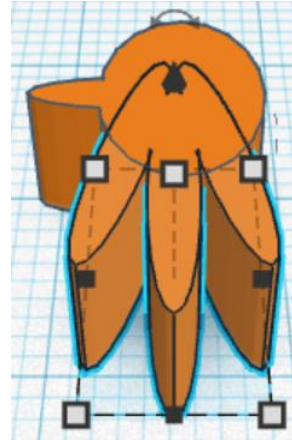
**Move Fingers** (Must be in home view for this to work!)  
move down in negative Y direction 3mm

**Hint:** Select Fingers and push down arrow key 3 times.

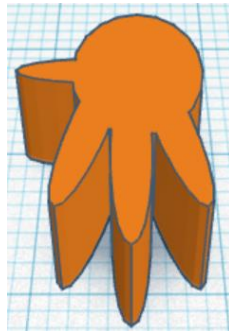
Before



After

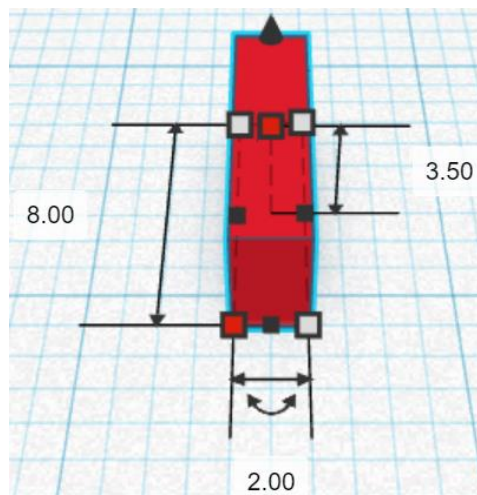


**Group Hand and Fingers**  
From now on this will be called the **Hand**



Bring in a Box, located in Basic Shapes on the right 1 shapes down.  
From now on this will be called the **Hand Joint**.

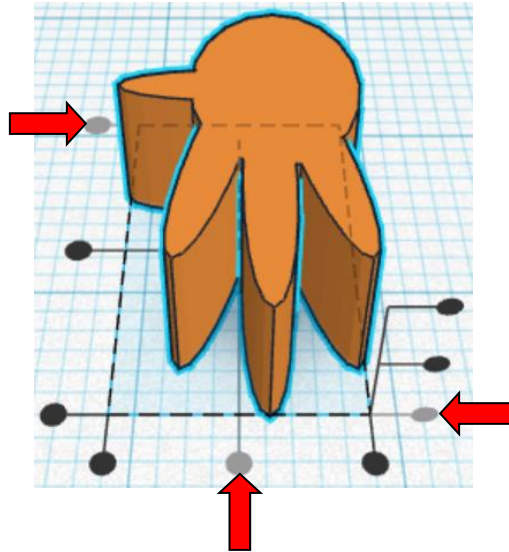
Change the dimensions to  
2mm X direction,  
8mm Y direction, and  
3.5mm Z direction.





**Align Hand and Hand Joint**

centered of X direction,  
back of Y direction, and  
bottom of Z direction.

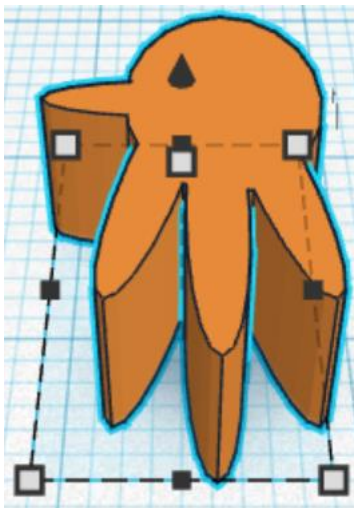


**Move Hand** (Must be in home view for this to work!)

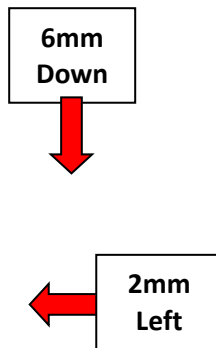
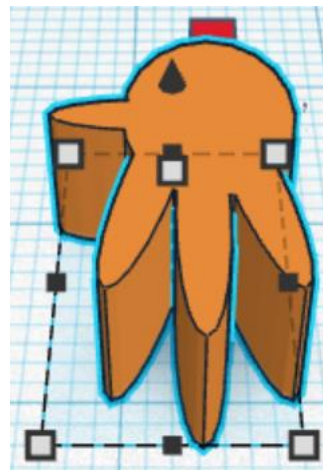
move down in negative Y direction 7mm  
and  
move left in negative X direction 2mm

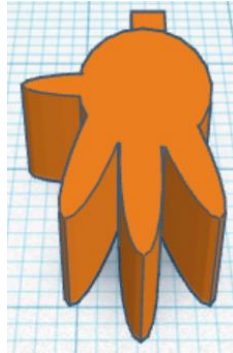
**Hint:** Select Hand and push down arrow key 6 times.  
And  
Select Hand and push left arrow key 2 times.

Before



After

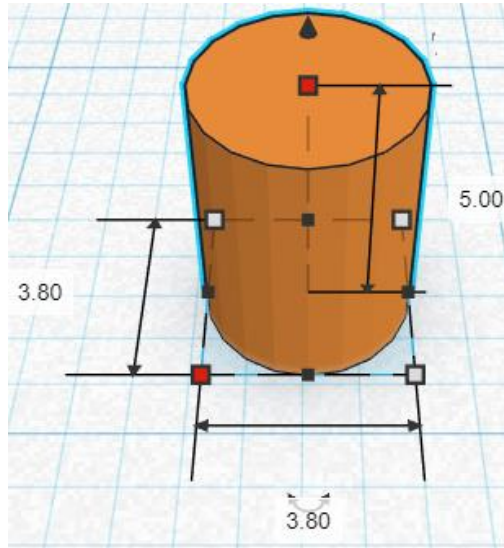




**Group Hand and Hand Joint**

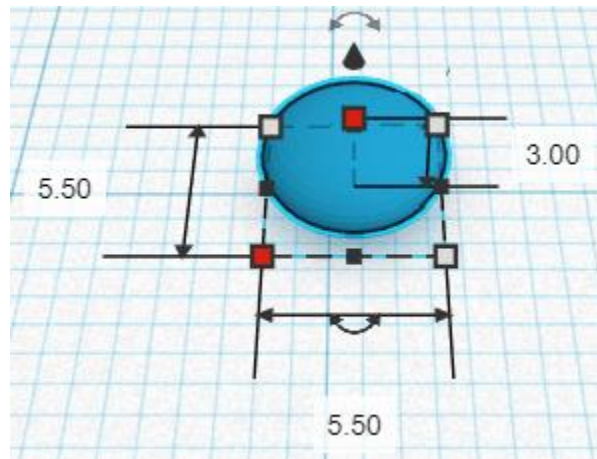
From now on this will be called the **Hand**

Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.  
From now on this will be called the **Hand Joint Cylinder**.



Change the dimensions to  
3.8mm X direction,  
3.8mm Y direction, and  
5mm Z direction.

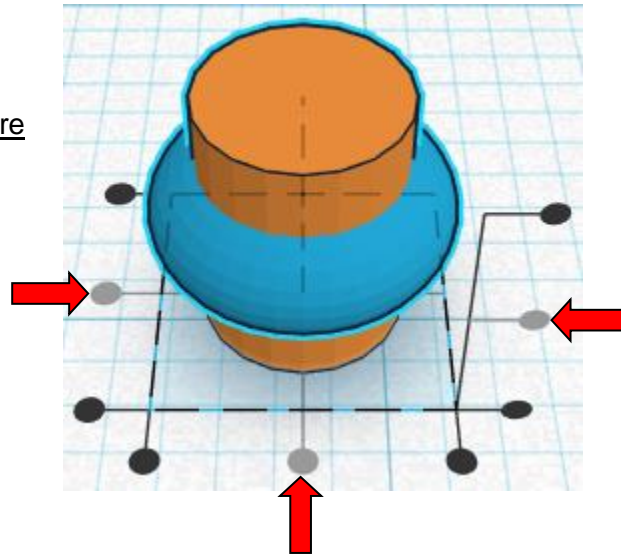
Bring in a Sphere, located in Basic Shapes on the center 2 shapes down.  
From now on this will be called the **Hand Joint Sphere**.



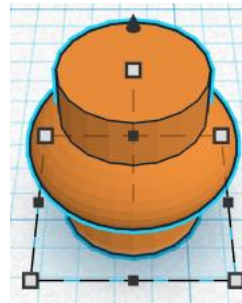
Change the dimensions to  
5.5mm X direction,  
5.5mm Y direction, and  
3mm Z direction.

**Align Hand Joint Cylinder and Hand Joint Sphere**

centered in X direction,  
centered of Y direction, and  
centered of Z direction.

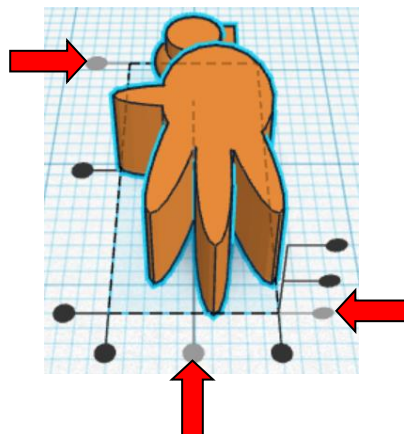


**Group Hand Joint Cylinder and Hand Joint Sphere**  
From now on this will be called the **Hand Joint Top**



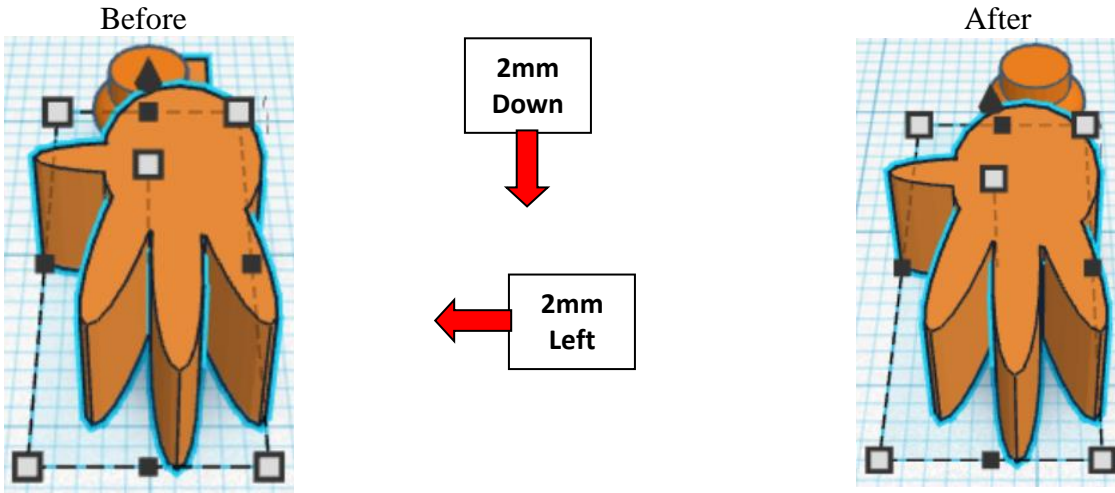
**Align Hand and Hand Joint Top**

centered in X direction,  
back of Y direction, and  
bottom of Z direction.

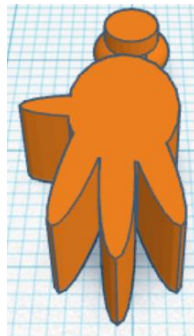


**Move Hand** (Must be in home view for this to work!)  
move down in negative Y direction 2mm  
and  
move left in negative X direction 2mm

**Hint:** Select Hand and push down arrow key 2 times.  
And  
Select Hand and push left arrow key 2 times.

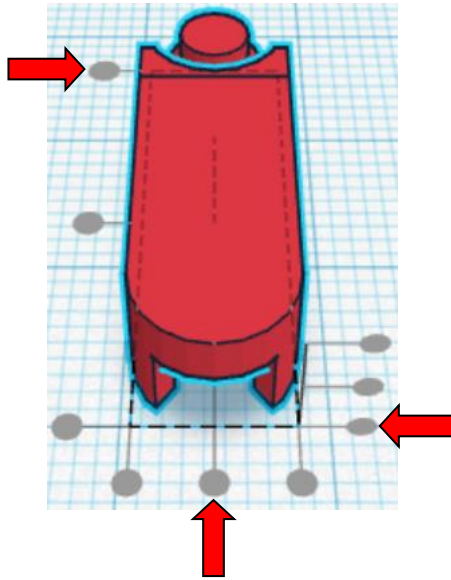


**Group Hand and Hand Joint Top**  
From now on this will be called the **Hand**



**Align Lower Arm and Upper Arm**

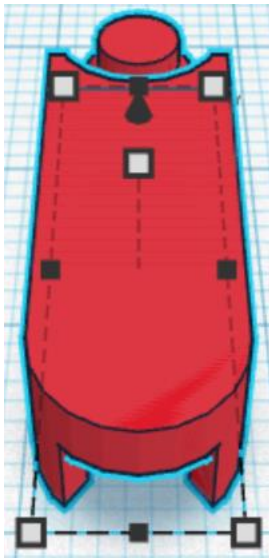
centered in X direction,  
back of Y direction, and  
bottom of Z direction.



**Move Lower Arm** (Must be in home view for this to work!)  
move down in negative Y direction 20mm

**Hint:** Select Lower Leg and push down arrow key 20 times.  
or  
Select Lower Leg and hold down shift and push down arrow key 2 time.

Before



After



20mm  
Down



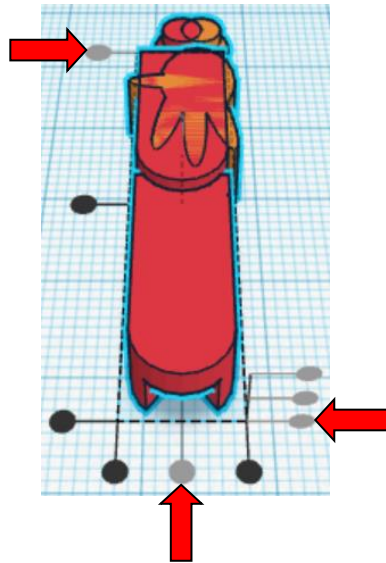


**Group Lower Arm and Upper Arm**  
From now on this will be called the **Arm**



**Align Hand and Arm**

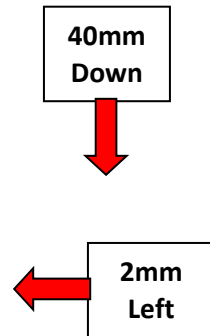
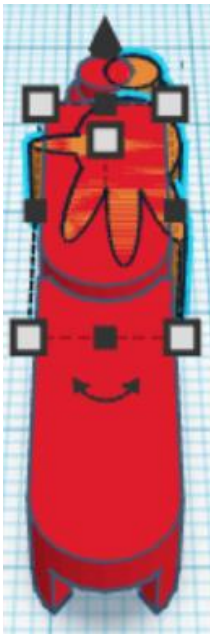
centered in X direction,  
back of Y direction, and  
bottom of Z direction.



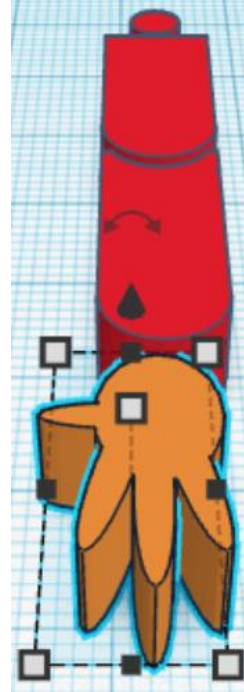
**Move Hand** (Must be in home view for this to work!)  
move down in negative Y direction 40mm  
and  
move left in negative X direction 2mm

**Hint:** Select Hand and push down arrow key 40 times.  
And  
Select Hand and push left arrow key 2 times.  
Or  
Select Hand and hold shift and push down arrow key 4 times.  
And  
Select Hand and push left arrow key 2 times.

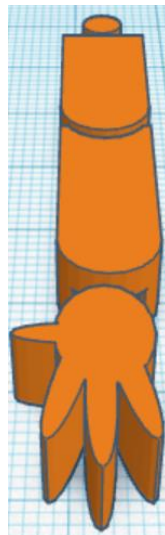
Before



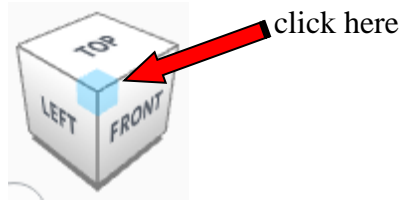
After



**Group Hand and Arm**  
From now on this will be called the **Arm**

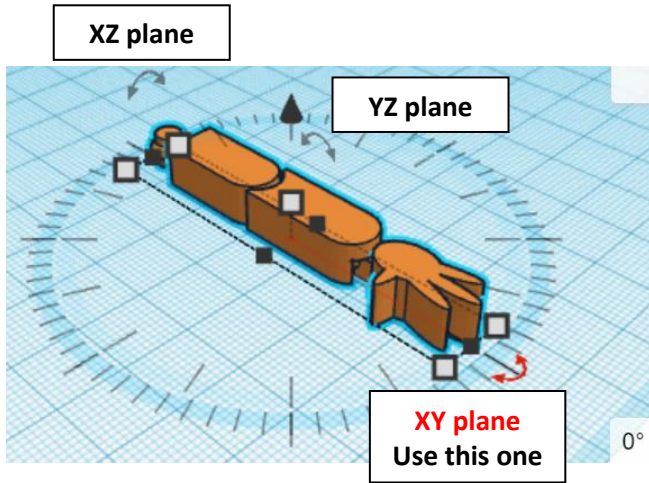


Go to TOP LEFT FRONT view for rotations

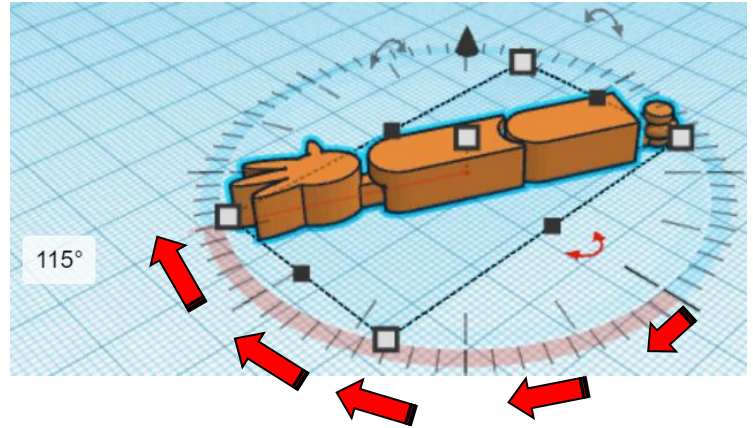


**Rotate** the Arm clockwise 115 degrees in XY plane.

Before



After

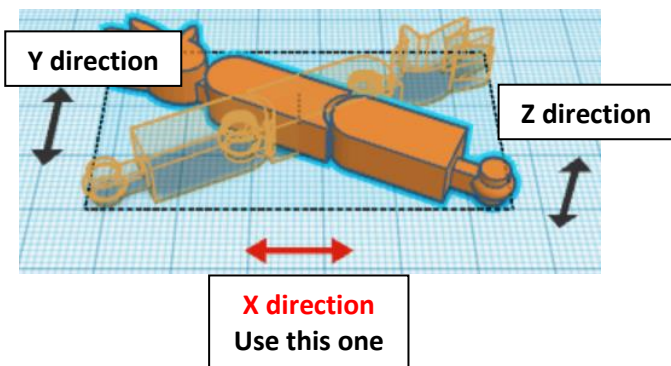


**Duplicate** Arm 1 time

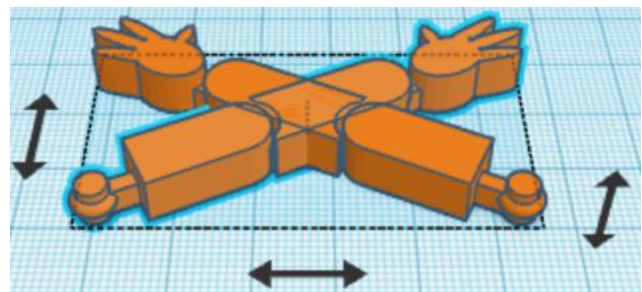
From now on this will be called the **Right Arm**

**Flip** Right Arm in X direction.

Before

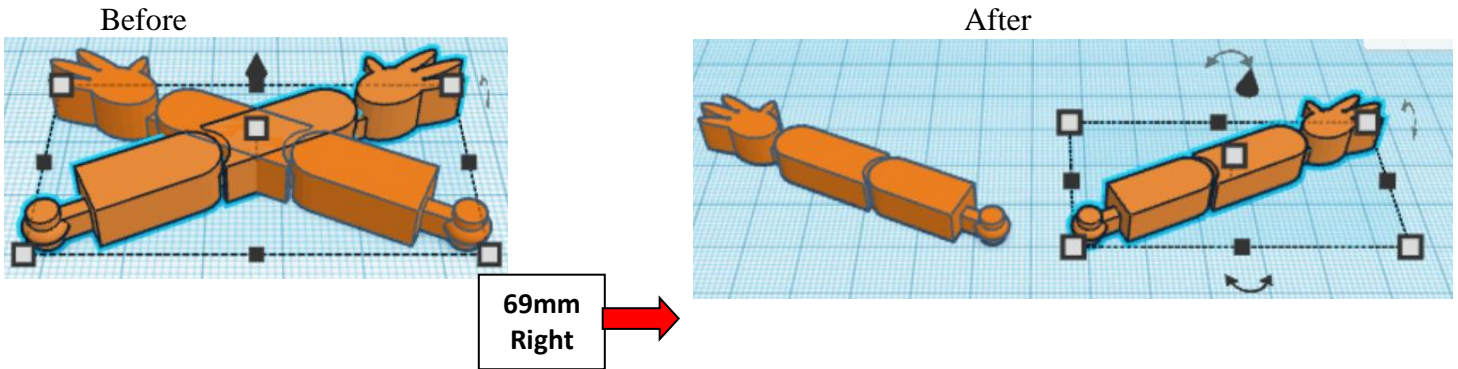


After

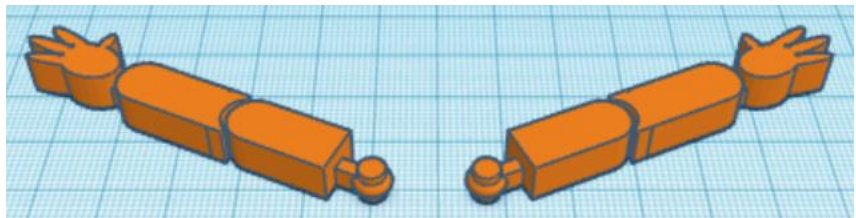


**Move Right Arm** (Must be in home view for this to work!)  
move right in positive X direction 69mm

**Hint:** Select Right Arm and push right arrow key 69 times.  
Or  
Select Right Arm and hold shift and push right arrow key 6 times.  
Then release shift and push right arrow key 9 more times.

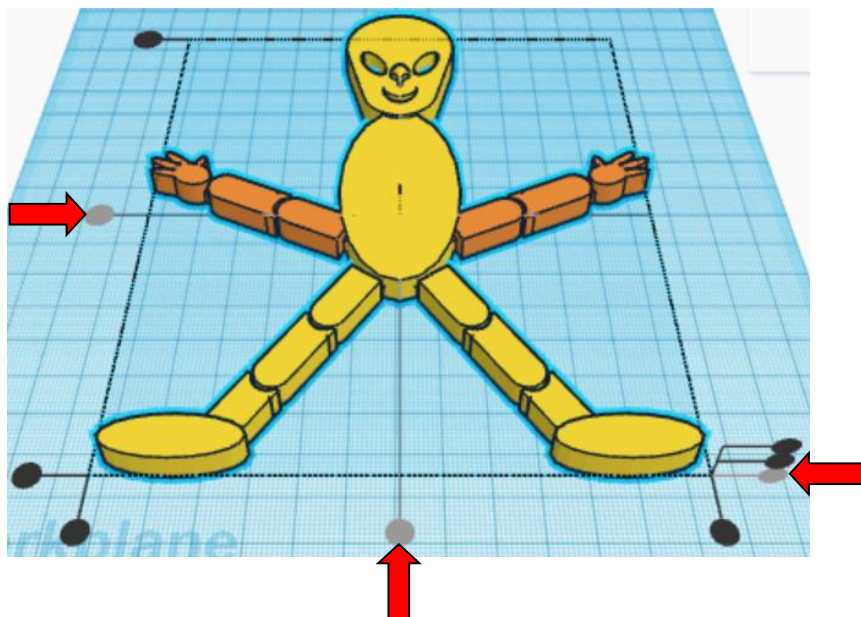


**Group Arm and Right Arm**  
From now on this will be called the **Arms**



**Align Alien and Arms**

centered in X direction,  
centered of Y direction, and  
bottom of Z direction.

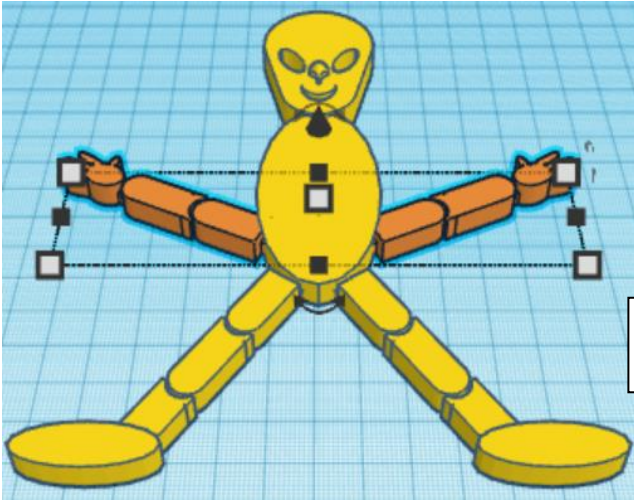




**Move Arms** (Must be in home view for this to work!)  
move up in positive Y direction 33mm

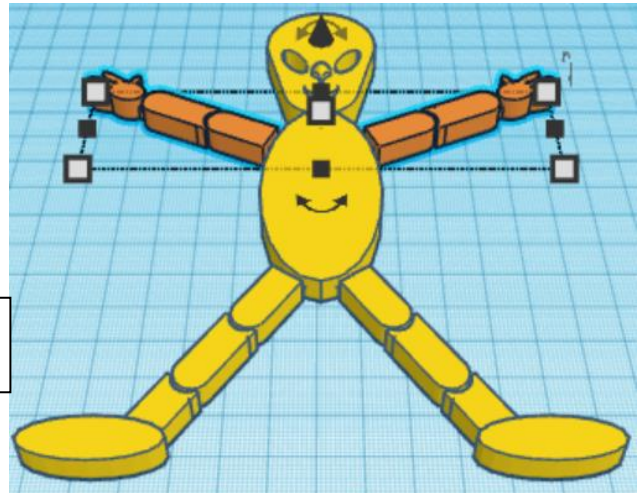
**Hint:** Select Arms and push up arrow key 33 times.  
Or  
Select Arms and hold shift and push up arrow key 3 times.  
Then release shift and push up arrow key 3 more times.

Before

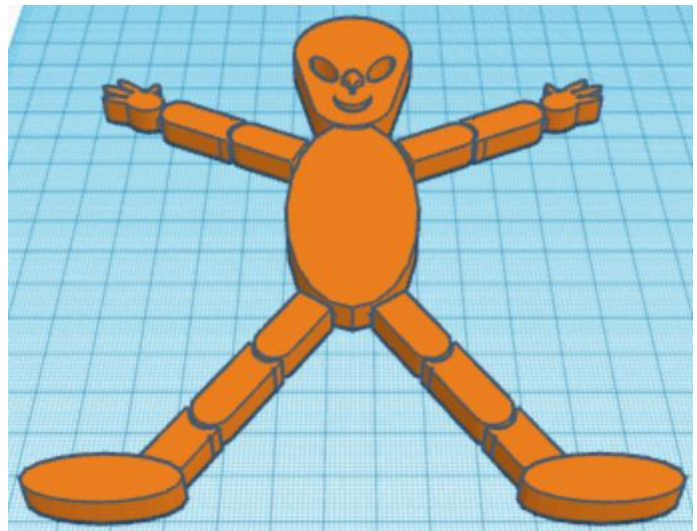


33mm  
Up

After



**Group Alien and Arms**  
From now on this will be called the **Dancing Alien**



**You are done! Print and wiggle each joint. Joints will sometimes stick.**

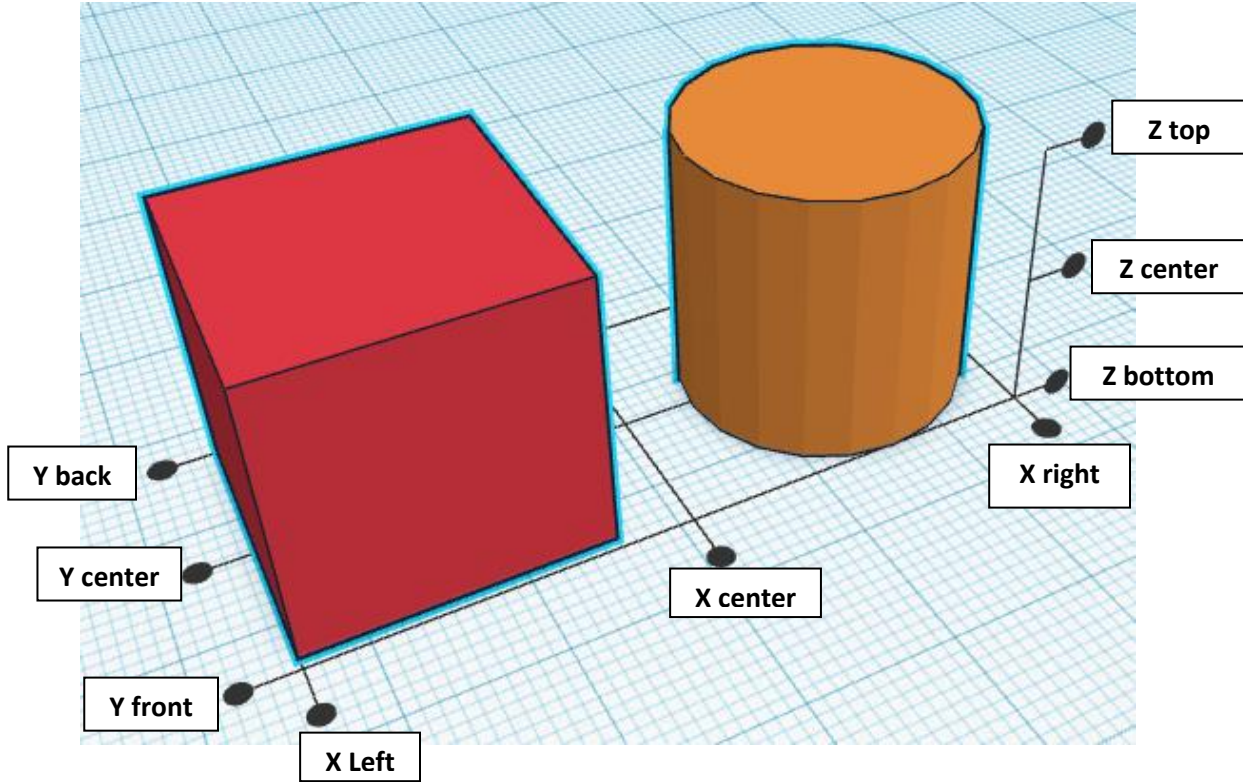


Reference to Aligning, Flip direction, Move direction, and Rotate direction.

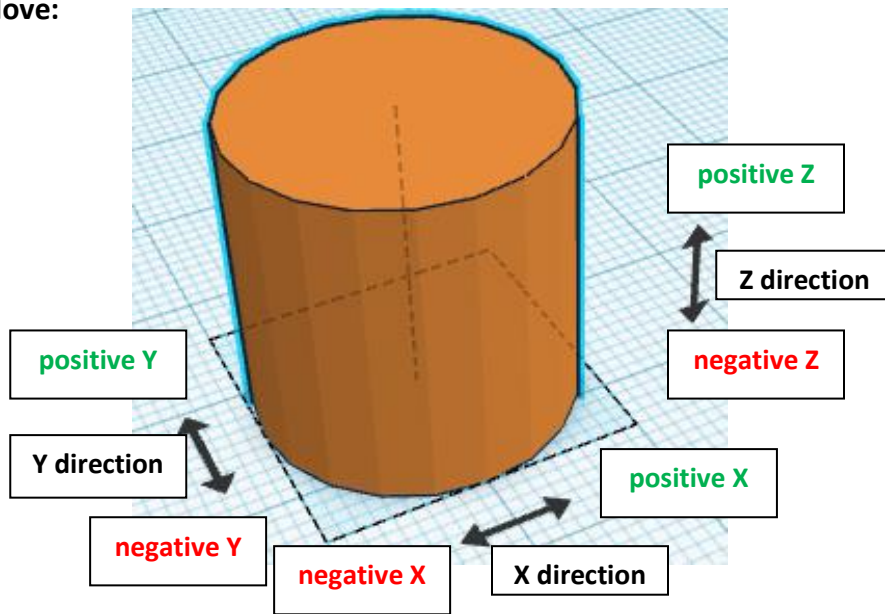
Always be in the "home view" when doing any of these!!!



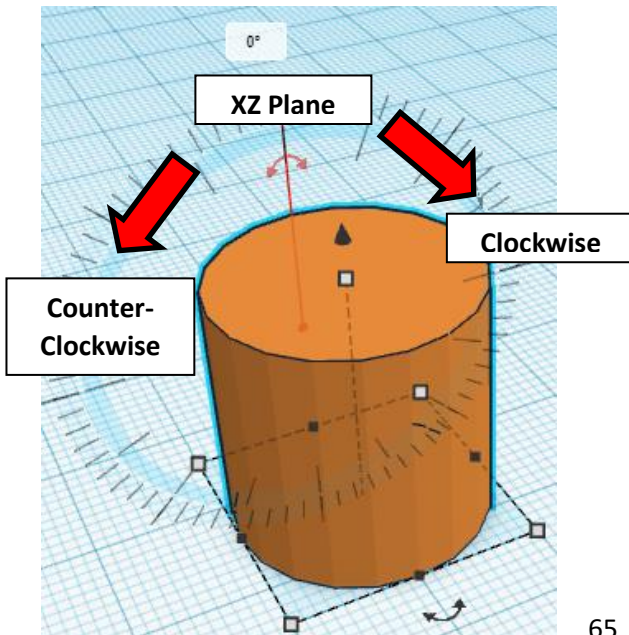
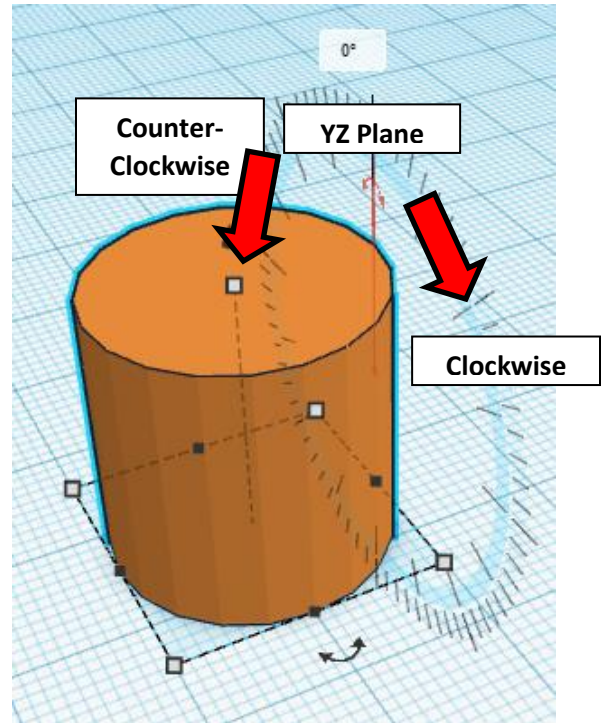
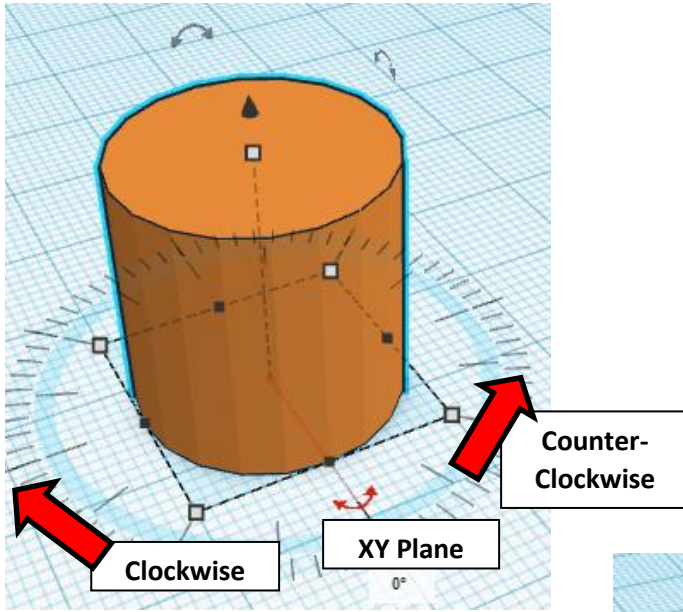
Aligning:



Flip or Mirror and Move:



Rotate:



# Tool Guide

## Most used Keyboard Shortcuts:

Transparency toggle	<b>T</b>	Duplicate object(s) in place.	<b>Ctrl</b> + <b>D</b>
Turn object(s) into <b>Holes</b>	<b>H</b>	Delete object(s)	<b>Del</b>
Turn object(s) into <b>Solids</b>	<b>S</b>	Undo action(s)	<b>Ctrl</b> + <b>Z</b>
<b>Align</b> object(s)	<b>L</b>	Zoom the view in or out	Mouse scroll wheel
<b>Flip/Mirror</b> object(s)	<b>M</b>	Zoom-in	<b>+</b>
<b>Drop</b> object(s) to workplane	<b>D</b>	Zoom-out	<b>-</b>
		Fit selected object(s) into view	<b>F</b>

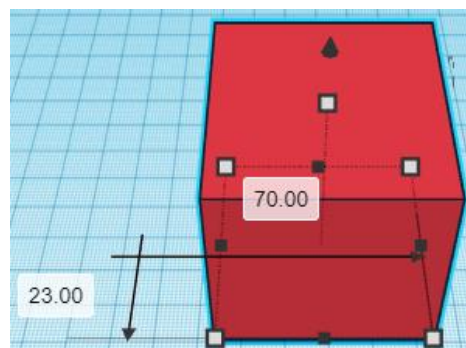
## Moving Object(s):

To move object(s) with mouse:

In XY Plane  
(left/right and forward/ backward)

Click and hold left mouse button on object.

Move mouse to desired location.

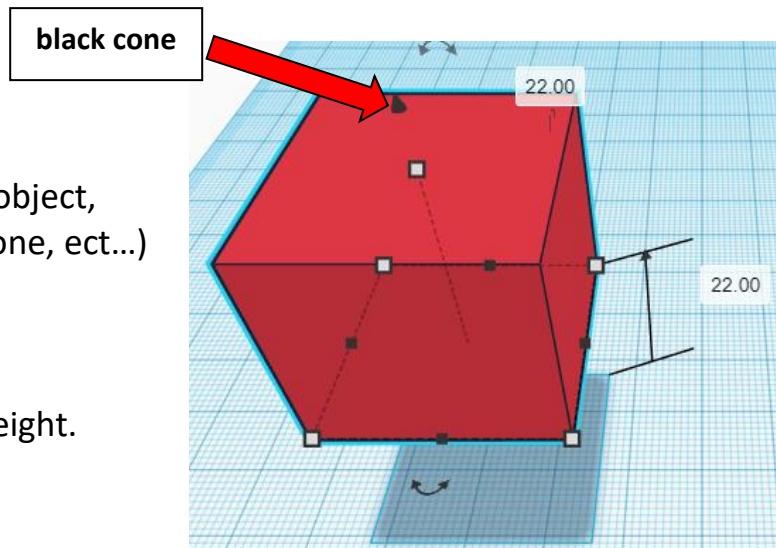


## Moving Object(s) continued:

### In Z direction (up/down)

Select object with left mouse button.  
Notice that several shapes appear on object,  
(white squares, black squares, black cone, ect...)

Click and hold left mouse button  
on the black cone at top of object.  
Move mouse up or down to desired height.



### To move object(s) with keyboard:

#### In XY Plane (left/right and forward/ backward)

Select object with left mouse button.

Use arrow keys to move the object in 1mm increments.



#### In XY Plane (fast) (left/right and forward/ backward)

Select object with left mouse button.

Hold shift key  
and use arrow keys to move the object in 10mm increments.





## Moving Object(s) continued:

### In Z direction (up/down)

Select object with left mouse button.



Hold control button  
and use up and down arrow keys to move the object in 1mm increments.

### In Z direction (fast) (up/down)

Select object with left mouse button.

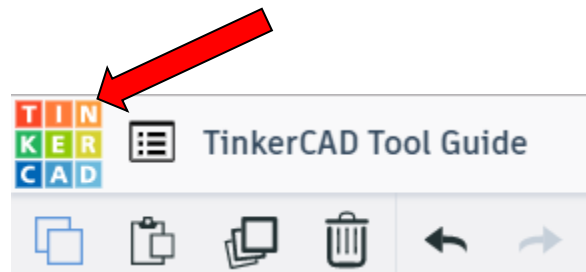


Hold control button and hold shift button  
and use up and down arrow keys to move the object in 10mm increments.

## Using on screen icons:

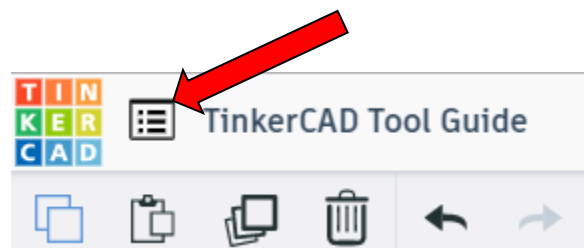
### TinkerCAD main screen:

(I know this doesn't look  
like an icon button, but it is)



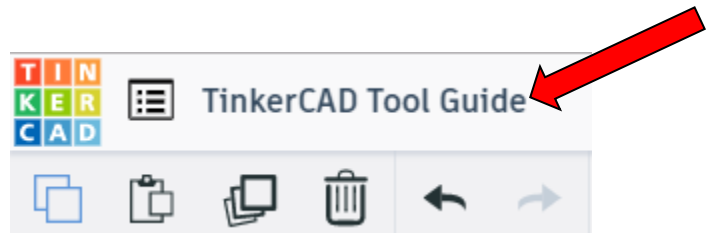
### My designs:

Pulls up menu of your designs.



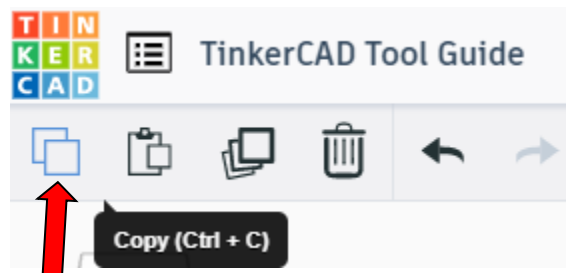
## Design name:

TinkerCAD automatically names your design a random name.  
Click here to change your design name.



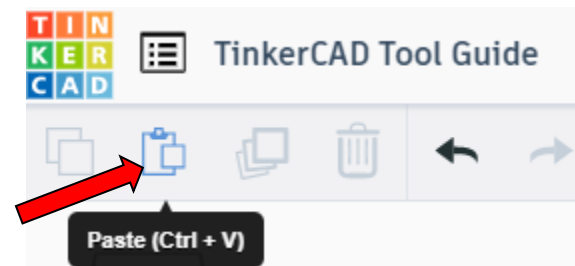
## Copy:

Select shape.  
Click copy or use ctrl + c  
Paste to copy or go into new design and paste to copy.



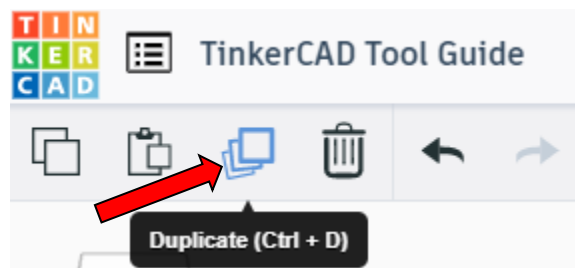
## Paste:

After using copy,  
click paste or use ctrl + v to paste.



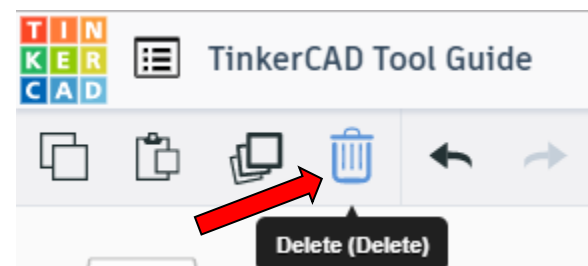
## Duplicate:

Similar to copy, but can't copy to other designs.  
Select shape.  
Click duplicate or use ctrl + d  
It will appear as if nothing happened, but if you move the shape you will see then duplicate underneath.



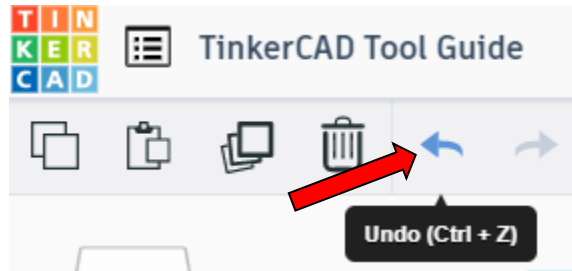
## Delete:

Select shape.  
Click delete or delete key.



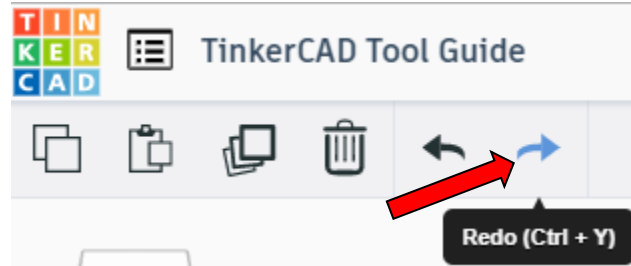
## Undo:

Click undo or use ctrl + z  
This will undo your last command.  
This can be repeated.



## Redo:

Click redo or use ctrl + y  
This will redo your last undo command,  
can only be used after using the  
undo command.



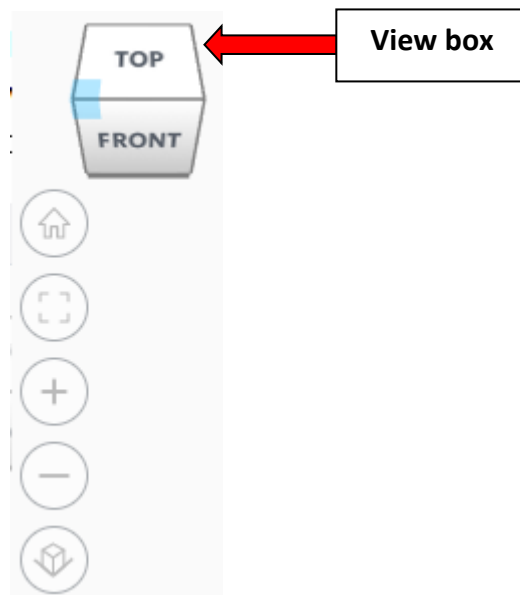
## Change View:

### To change view with mouse:

Right click and hold anywhere in work area. While holding right mouse button move mouse.  
This will change the view of the work area.

### To change view with icons:

Left click on view box.  
Where you click determines  
the view shown.

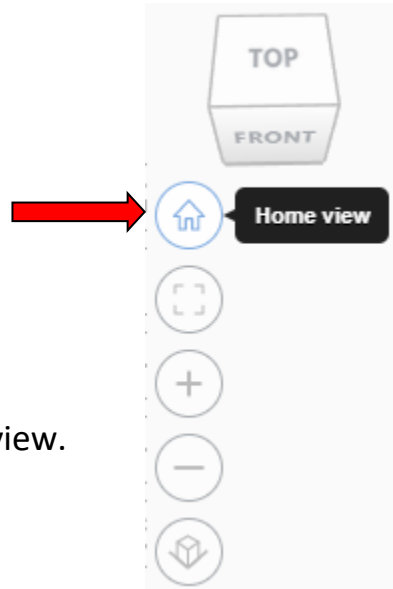


## Change view to home view:

Most TinkerCAD Tutorials only work while in home view.

Click on home view icon to go to the home view.

You can also use the view box between the top and front view to change to the home view.



## Fit all in view:

If you lose an object off the screen, you can click on Fit all in view to un-zoom to see all objects.

## Fit one or more object(s) in view:

If you want to only see one or more object(s) in the view then select the object(s) and click Fit all in view or click the "f" key. This will zoom in on the object(s).



## Zoom in:

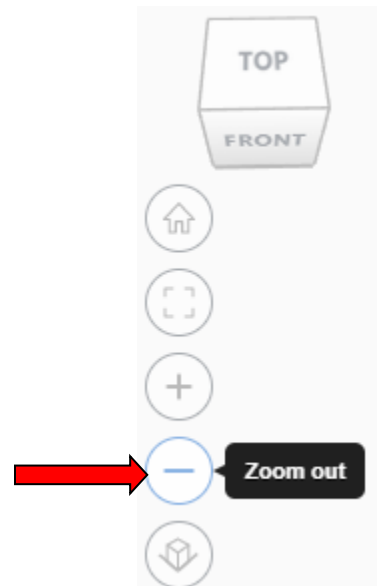
Click the Zoom in icon or click the "+" key to zoom in.





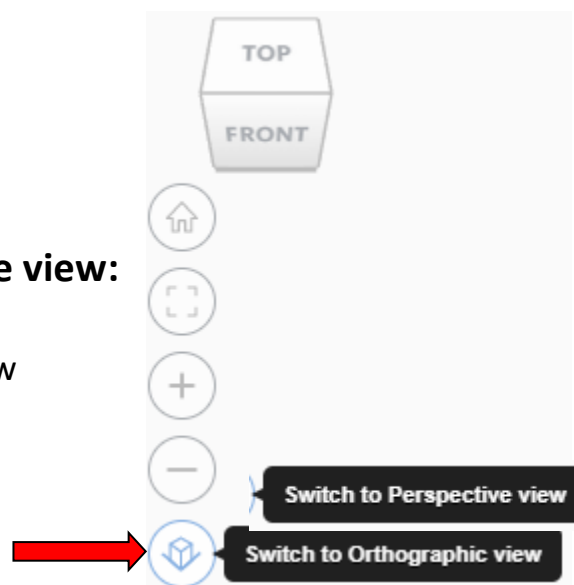
## Zoom out:

Click the Zoom out icon or click the “-” key to zoom out.



## Switching to orthographic and perspective view:

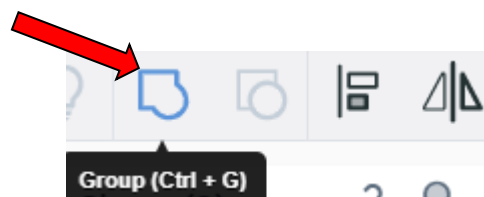
Click the Switch to orthographic/perspective view  
To change to your preferred view.



## Group:

To combine two or more objects into one object.

Select the objects to combine and click the  
Group button or click ctrl + G



## Ungroup:

After group objects, this will ungroup the object  
back to separate objects.

Select the objects to ungroup and click the  
ungroup button or click ctrl + shift + G



## Align:

To perfectly center objects to each other or  
To line up objects along their edges then use align.

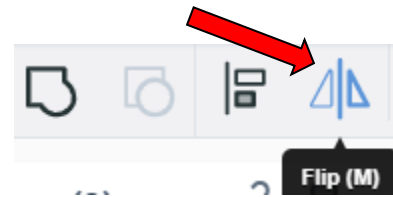
Select the objects to align and click the  
align button or click “L”



## Flip (Mirror):

This is mainly used for symmetric builds,  
you create one half, duplicate it, then flip it  
and move it in place and group it.

Select the objects to flip and click the  
flip button or click “M”



# Full list of Keyboard Shortcuts

## MOVING OBJECT(S)

(Using keyboard)

Move along X/Y axis	← / ↑ / ↓ / →
Move along Z axis	Ctrl + ↓ / ↑
×10 Nudge along X/Y axis	Shift + ← / ↑ / ↓ / →
×10 Nudge along Z axis	Ctrl + Shift + ↓ / ↑

## KEYBOARD + MOUSE SHORTCUTS

(Press and hold the keys, then click and drag the mouse)

Duplicate dragged object(s)	Alt + Drag left mouse button
Select multiple object(s)	Shift + Left mouse button
45° rotation	Shift (Hold while rotating)
Scale in one direction	Alt + Hold side handle
Scale in two directions	Alt + Hold corner handle
Uniform scale	Shift + Hold corner handle
Uniform scale in all directions	Alt + Shift + Corner handle
Uniform scale in all directions	Alt + Shift + Top handle

## VIEWING DESIGNS

(With the help of a mouse or a mouse pad)

Orbit the view	Right mouse button
Orbit the view	Ctrl + Left mouse button
Pan the view	Shift + Right mouse button
Pan the view	Ctrl + Shift + left button
Zoom the view in or out	Mouse scroll wheel
Zoom-in	+
Zoom-out	-
Fit selected object(s) into view	F

## OBJECT SETTINGS

Transparency toggle	T
Turn object(s) into Holes	H
Turn object(s) into Solids	S
Lock or Unlock object(s)	Ctrl + L
Hide object(s)	Ctrl + H
Show all hidden object(s)	Ctrl + Shift + H

## TOOLS AND COMMANDS

Copy object(s)	Ctrl + C
Paste object(s)	Ctrl + V
Duplicate object(s) in place.	Ctrl + D
Delete object(s)	Del
Undo action(s)	Ctrl + Z
Redo action(s)	Ctrl + Y
Redo action(s)	Ctrl + Shift + Z
Group object(s)	Ctrl + G
Un-group object(s)	Ctrl + Shift + G
Align object(s)	L
Flip/Mirror objects(s)	M
Select all object(s)	Ctrl + A
Place a Ruler	R ( Shift toggle midpoint/center )
Place a Workplane	W ( press Shift to flip direction )
Drop object(s) to workplane	D