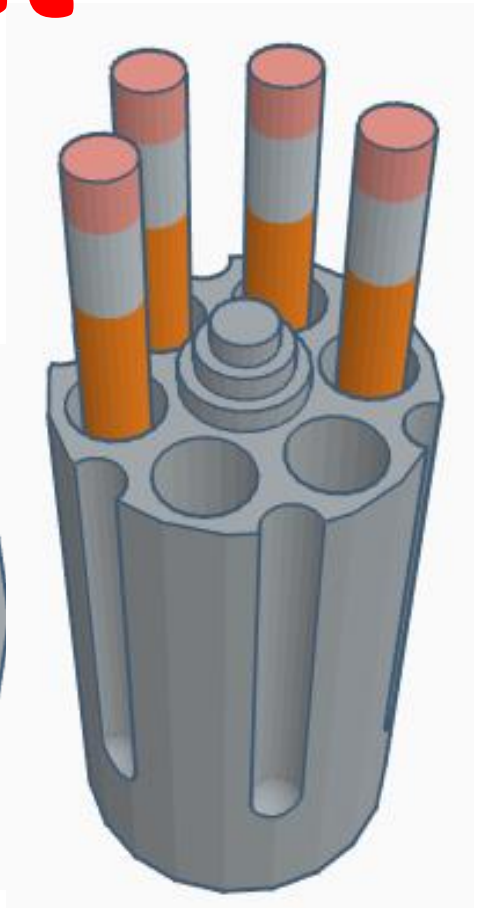
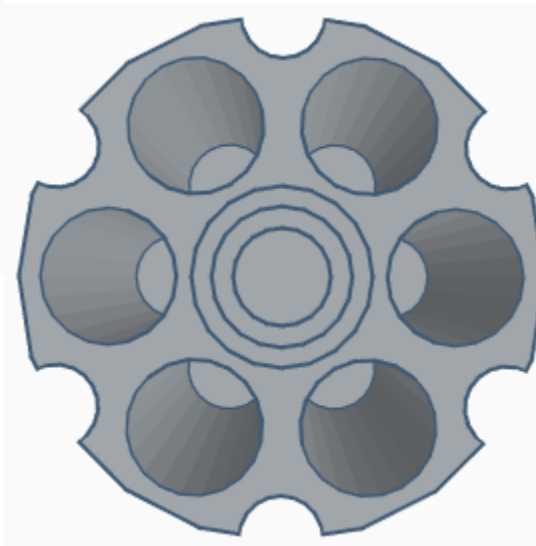
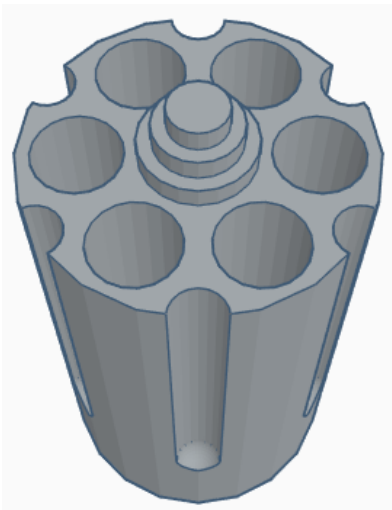




Revolver Cylinder Pencil Holder Project



Contents:

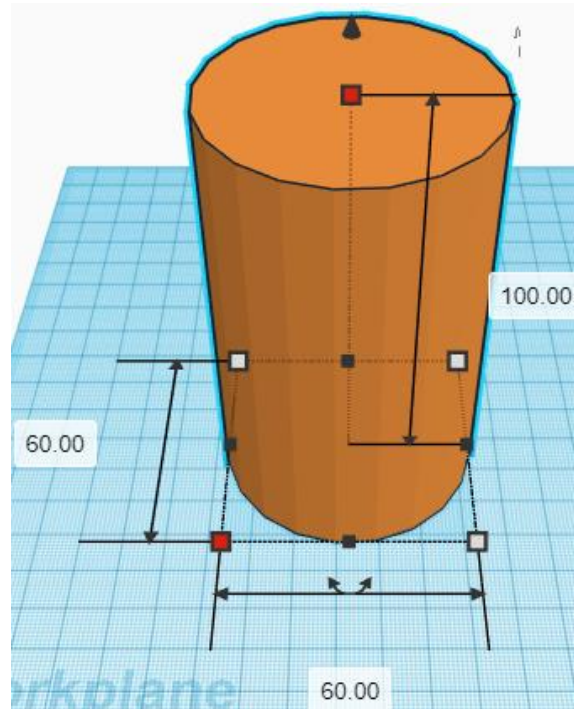
Cover.....	1
Table of Contents.....	2
Cylinder and Cylinder Cutout ..	3
Pencil Hole Cutout	10
Cylinder Pins	14
References.....	17
Tool Guide.....	19

Revolver Cylinder Pencil Holder:

Cylinder and Cylinder Cutout:

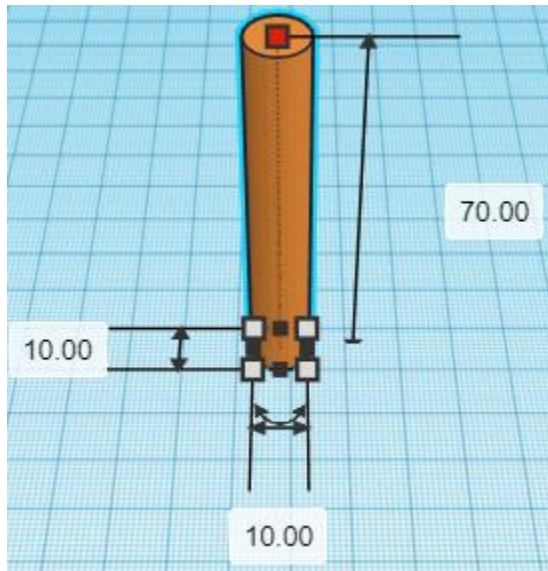
Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Cylinder**.

Change the dimensions to
60mm X direction,
60mm Y direction, and
100mm Z direction.



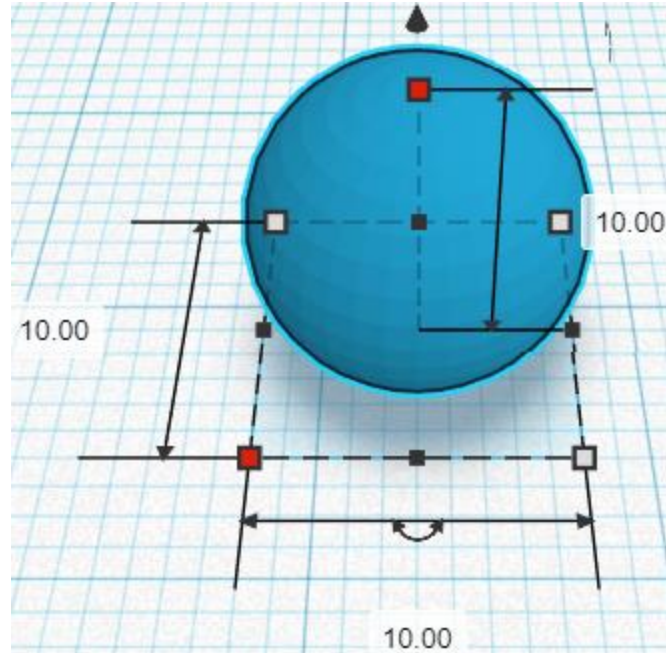
Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Cylinder Cutout**.

Change the dimensions to
10mm X direction,
10mm Y direction, and
70mm Z direction.



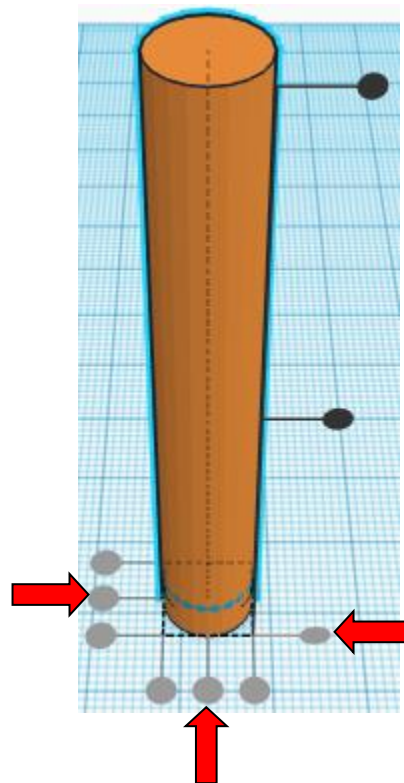
Bring in a Sphere, located in Basic Shapes on the left 3 shapes down.
From now on this will be called the **Cylinder Cutout Bottom**.

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



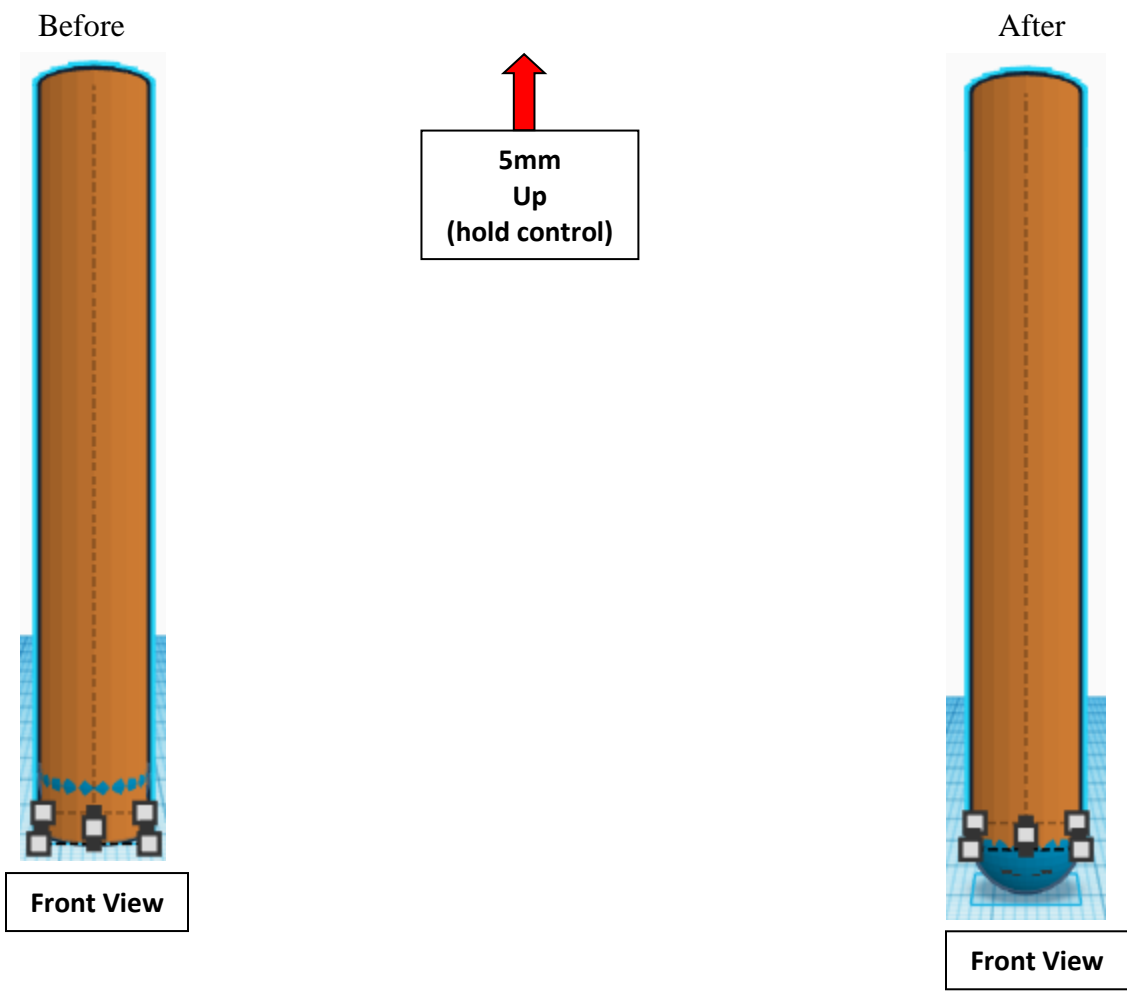
Align Cylinder Cutout and Cylinder Cutout Bottom

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

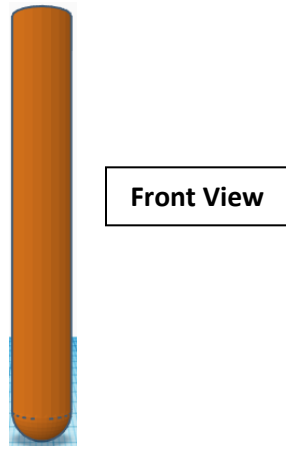


Move Cylinder Cutout (Must be in home view for this to work!)
move up in positive Z direction 5mm

Hint: Select Cylinder Cutout and hold control and push up arrow key 5 times.



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

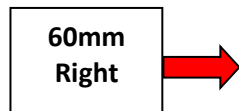
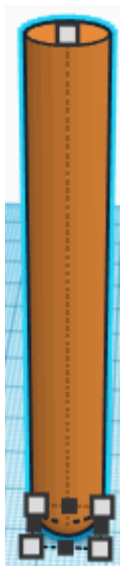


Duplicate Cylinder Cutout 1 time
From now on this will be called the **Right Cylinder Cutout**

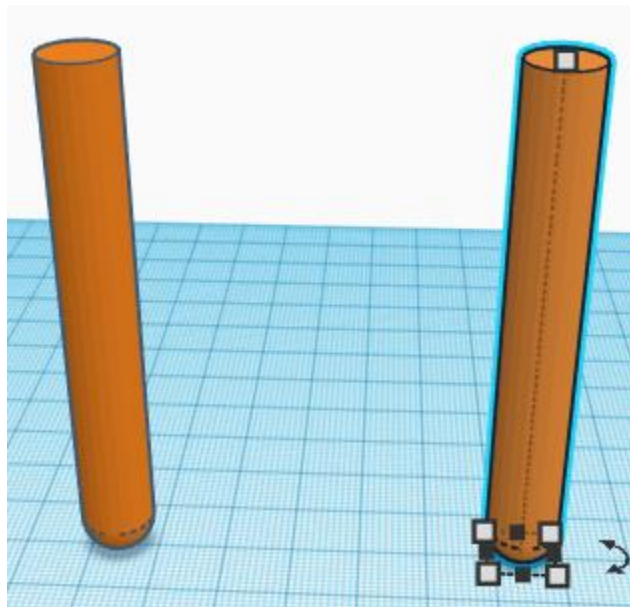
Move Right Cylinder Cutout (Must be in home view for this to work!)
move right in positive X direction 60mm

Hint: Select Right Cylinder Cutout and push right arrow key 60 times.
Or
Select Right Cylinder Cutout and hold shift and push right arrow key 6 times.

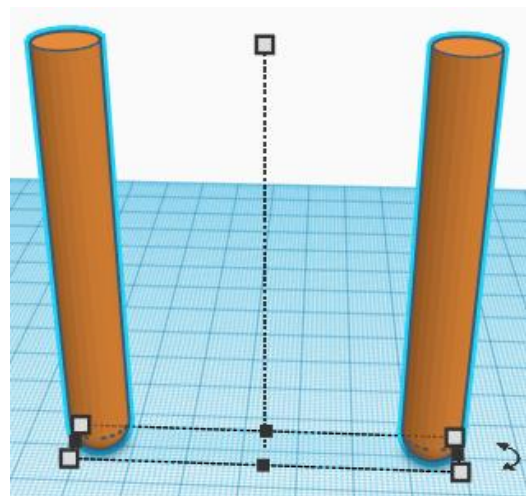
Before



After



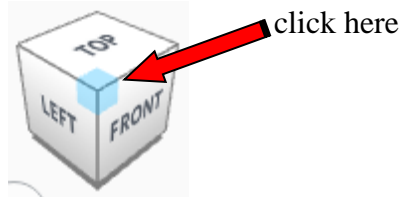
Group Cylinder Cutout and Right Cylinder Cutout
From now on this will be called the **Cylinder Cutout Set**



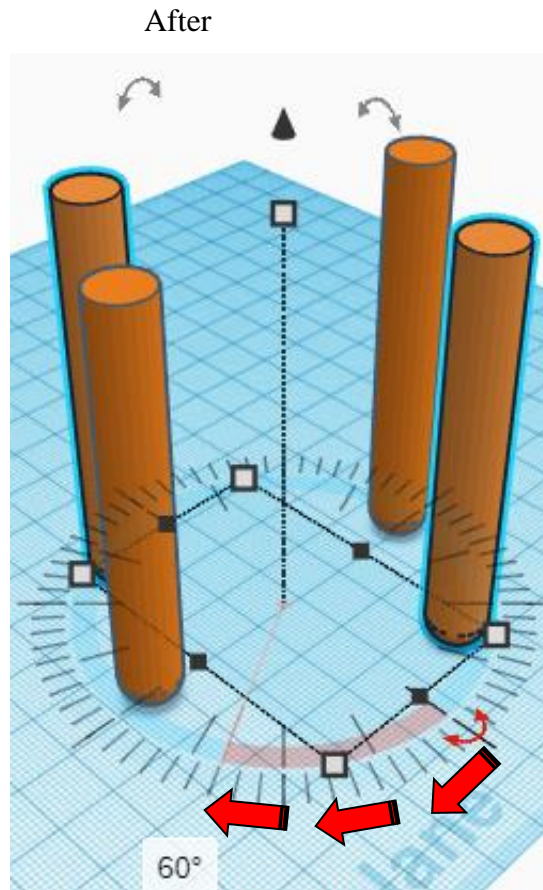
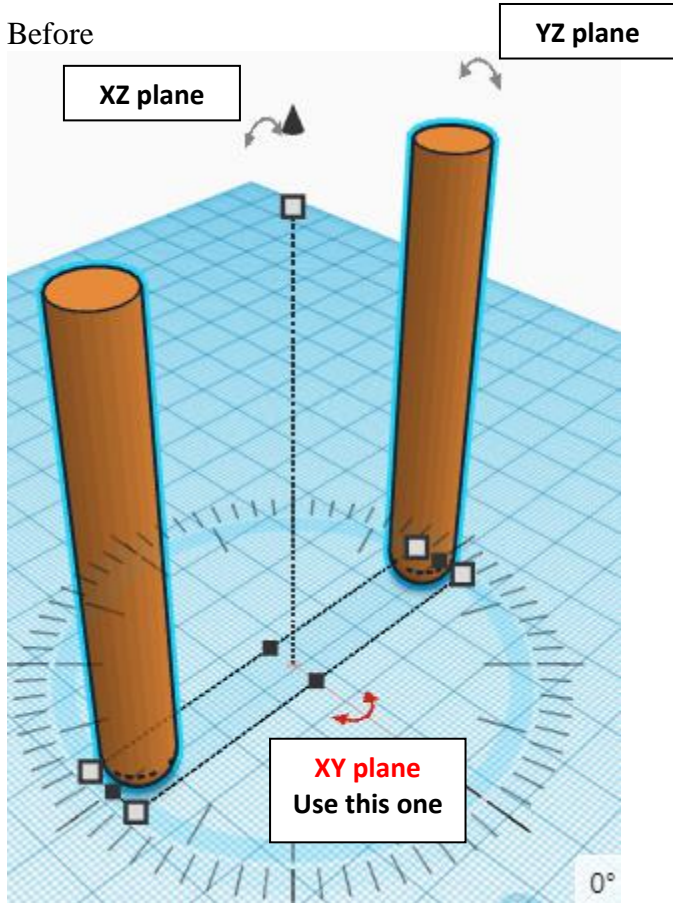
Duplicate Cylinder Cutout Set 1 time

From now on this will be called the **Rotated Cylinder Cutout Set**

Go to TOP LEFT FRONT view for rotations

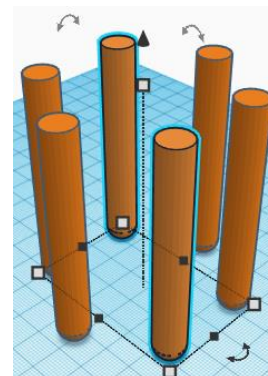


Rotate the Rotated Cylinder Cutout Set clockwise 60 degrees in XY plane.

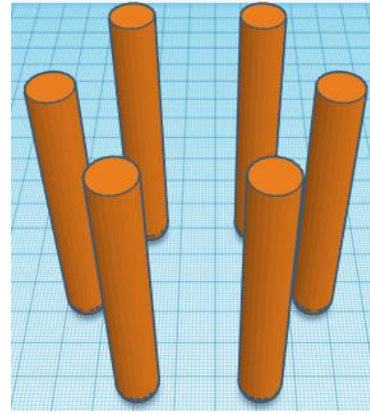


Immediately push ctrl-d 1 time to repeat this process once.

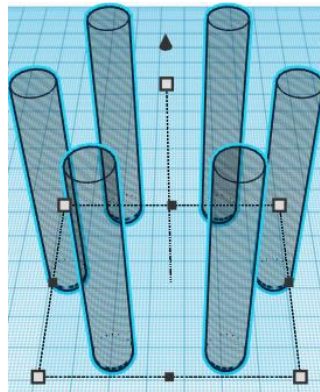
(If you don't immediately push ctrl-d, then do the duplicate and rotate the Rotated Cylinder Cutout Set again, 1 more time.)



Group Cylinder Cutout Set and Rotated Cylinder Cutout Set
From now on this will be called the **Cylinder Cutout Set**

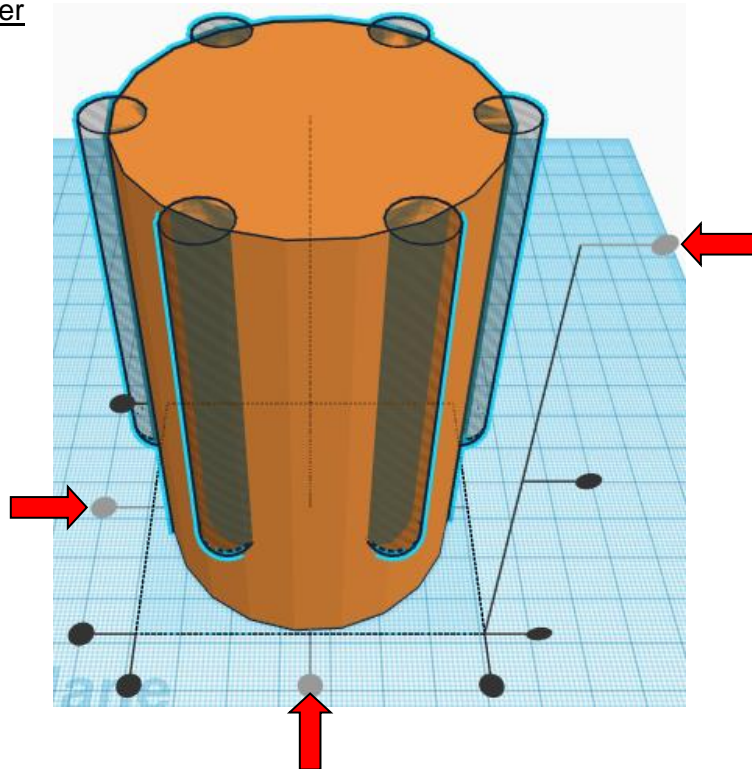


Change Cylinder Cutout Set to **Hole** by selecting Cylinder Cutout Set and typing "h".

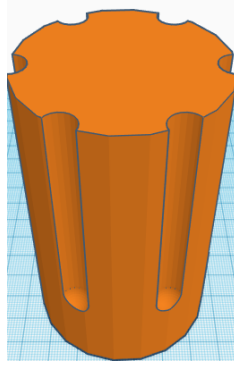


Align Cylinder Cutout Set and Cylinder

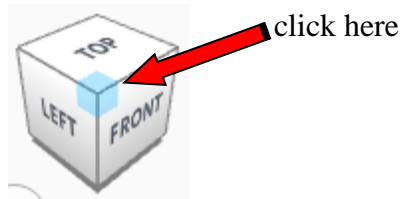
centered in X direction,
centered of Y direction, and
top of Z direction.



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

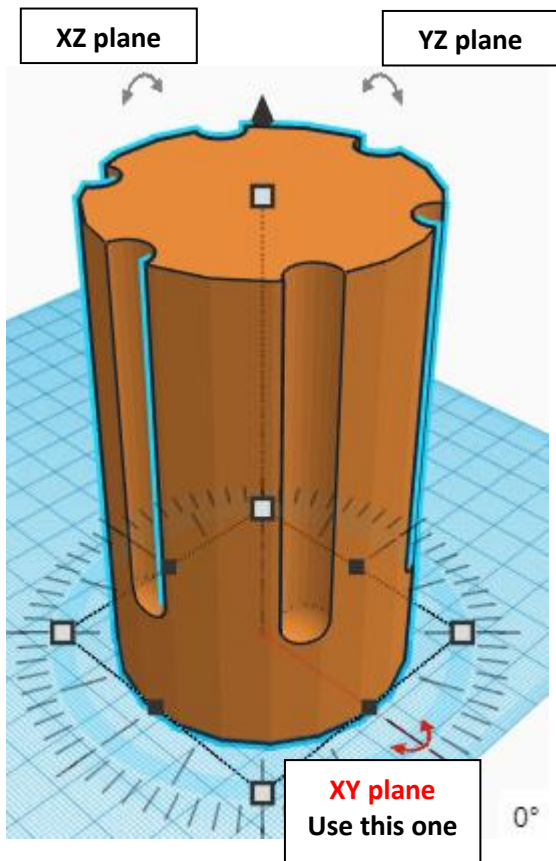


Go to TOP LEFT FRONT view for rotations

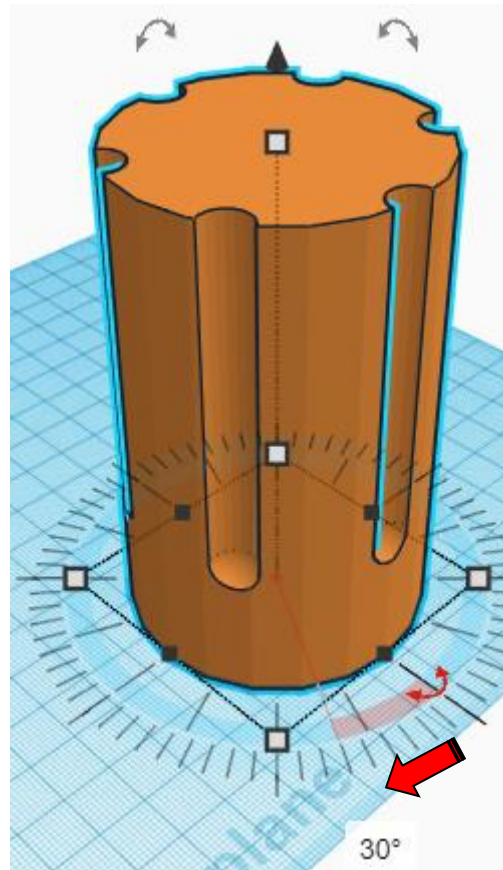


Rotate the Cylinder clockwise 30 degrees in XY plane.

Before



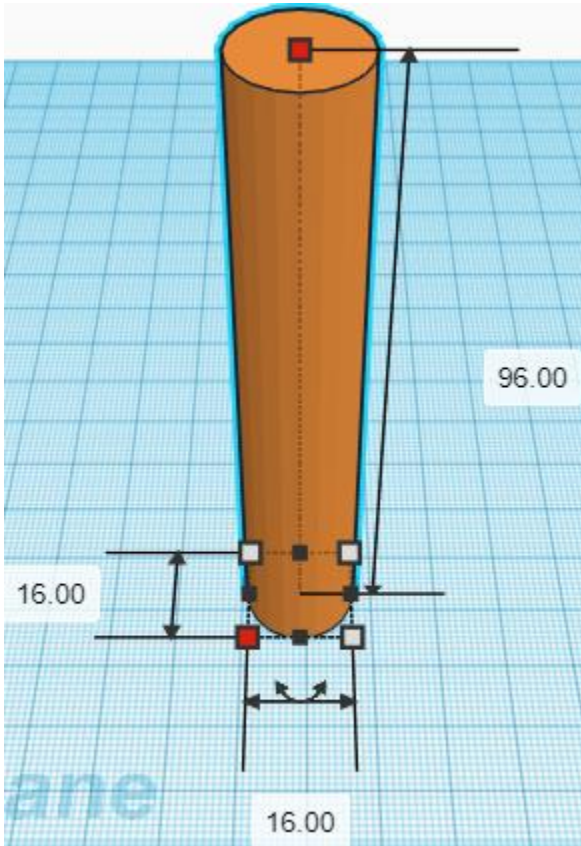
After



Pencil Hole Cutout:

Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Pencil Hole Cutout**.

Change the dimensions to
16mm X direction,
16mm Y direction, and
96mm Z direction.

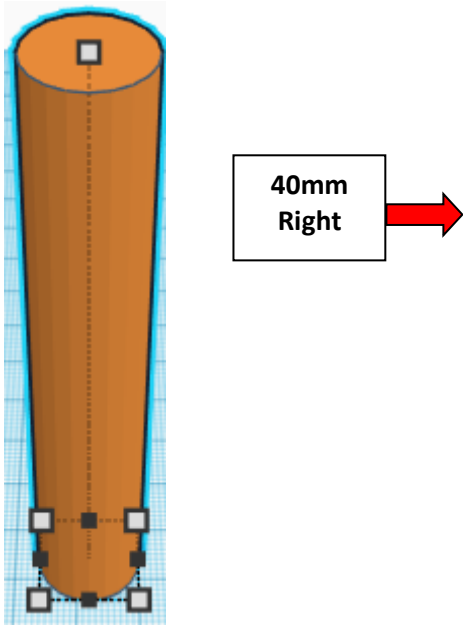


Duplicate Pencil Hole Cutout 1 time
From now on this will be called the **Right Pencil Hole Cutout**

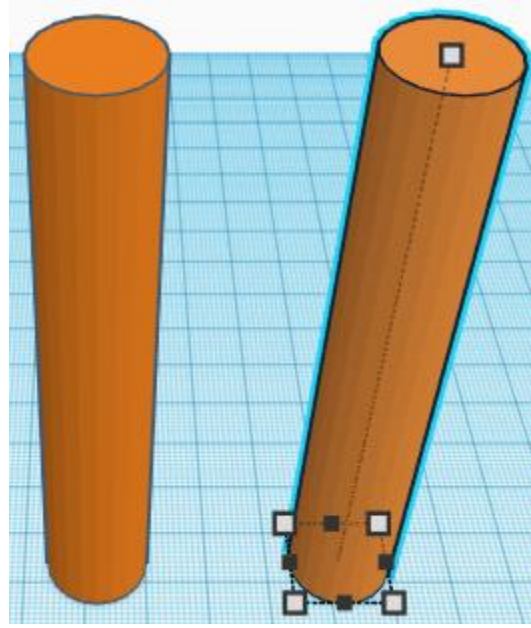
Move Right Pencil Hole Cutout (Must be in home view for this to work!)
move right in positive X direction 40mm

Hint: Select Right Pencil Hole Cutout and push right arrow key 40 times.
Or
Select Right Pencil Hole Cutout and hold shift and push right arrow key 4 times.

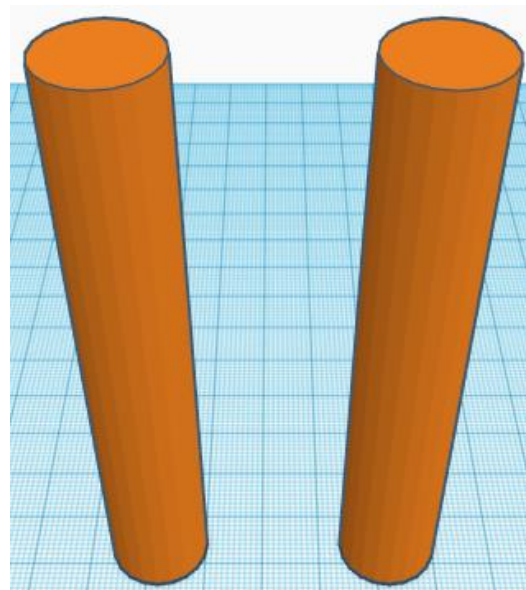
Before



After



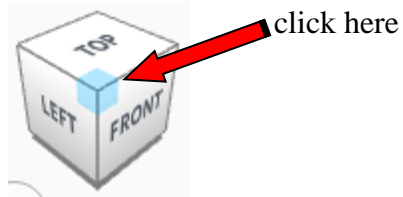
Group Right Pencil Hole Cutout and Pencil Hole Cutout
From now on this will be called the **Pencil Hole Cutout Set**



Duplicate Pencil Hole Cutout Set 1 time

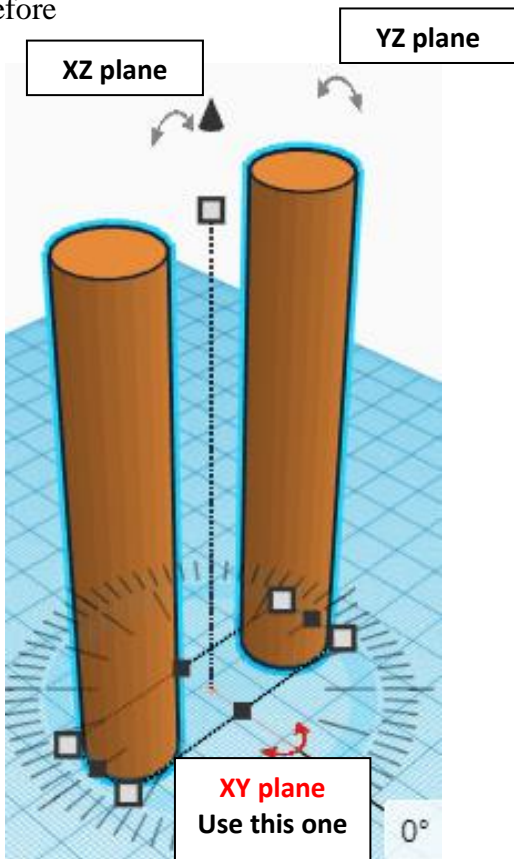
From now on this will be called the **Rotated Pencil Hole Cutout Set**

Go to TOP LEFT FRONT view for rotations

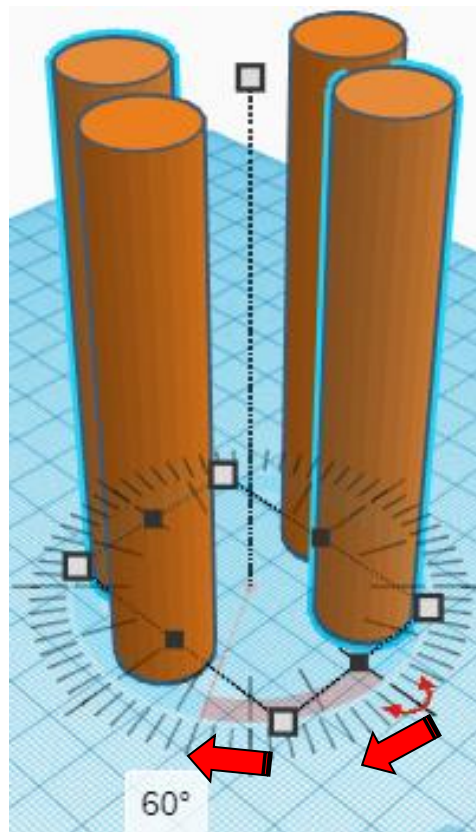


Rotate the Rotated Pencil Hole Cutout Set clockwise 60 degrees in XY plane.

Before

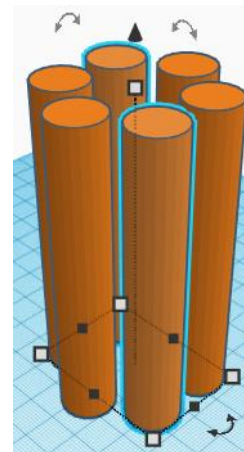


After

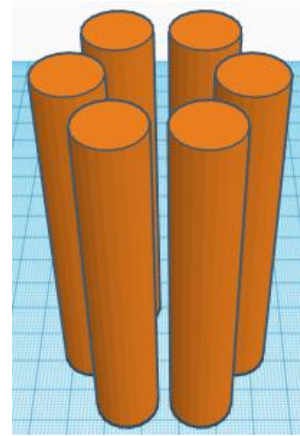


Immediately push ctrl-d 1 time to repeat this process once.

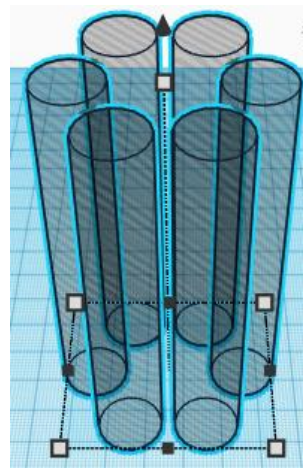
(If you don't immediately push ctrl-d, then do the duplicate and rotate the Rotated Pencil Hole Cutout Set again, 1 more time.)



Group Rotated Pencil Hole Cutout Set and Pencil Hole Cutout Set
From now on this will be called the **Pencil Hole Cutout Set**

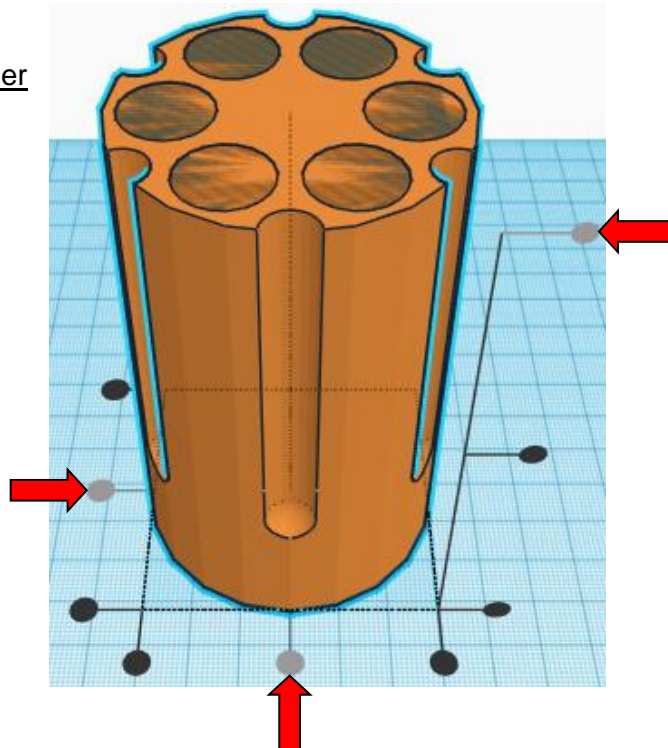


Change Pencil Hole Cutout Set to **Hole** by selecting Pencil Hole Cutout Set and typing "h".

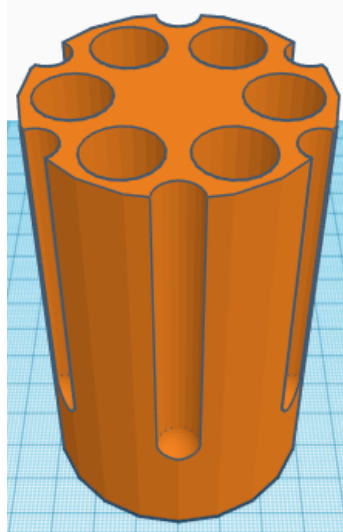


Align Pencil Hole Cutout Set and Cylinder

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



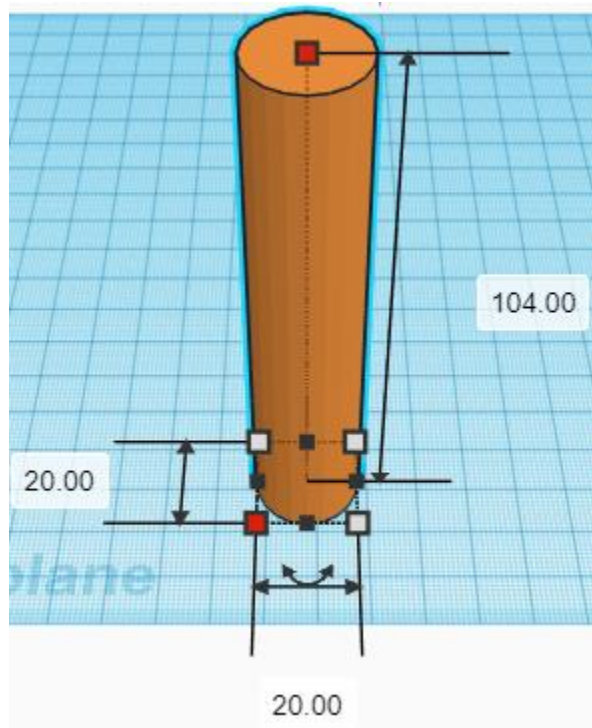
Group Pencil Hole Cutout Set and Cylinder
From now on this will be called the **Cylinder**



Cylinder Pins:

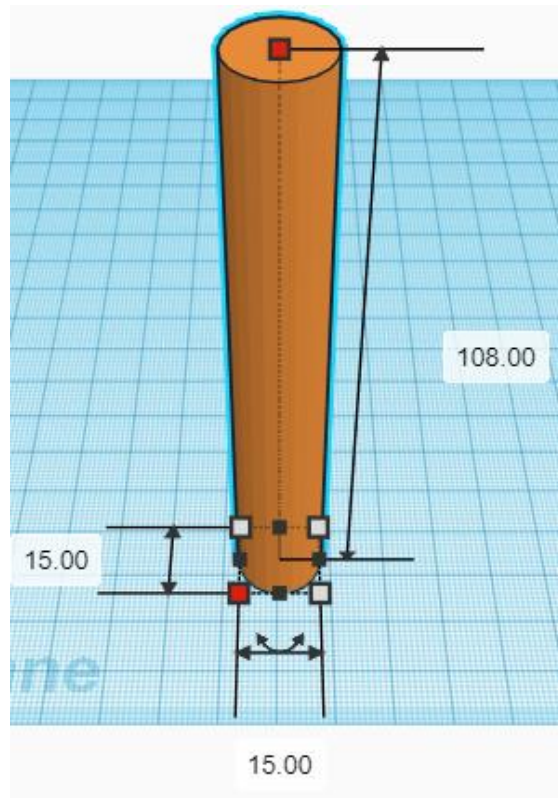
Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Cylinder Pin 1**.

Change the dimensions to
20mm X direction,
20mm Y direction, and
104mm Z direction.



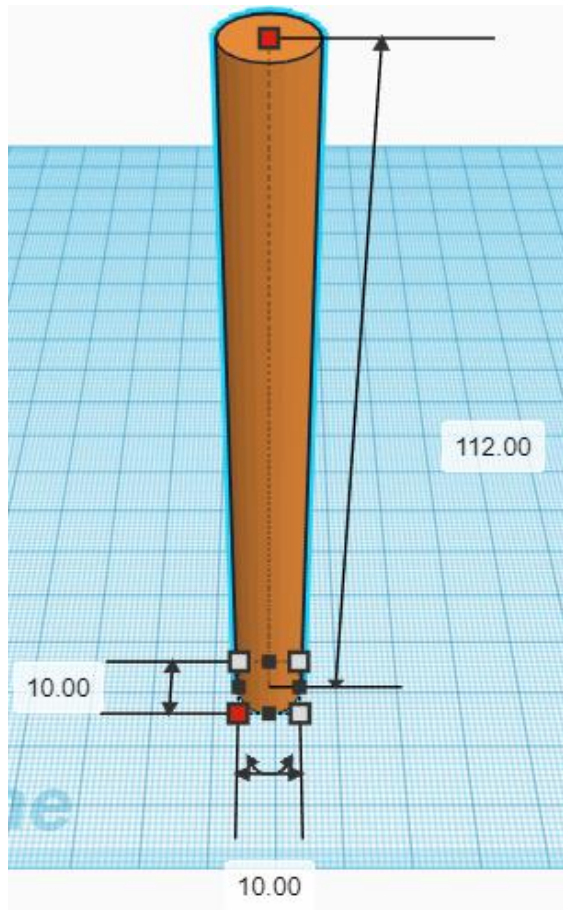
Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Cylinder Pin 2**.

Change the dimensions to
15mm X direction,
15mm Y direction, and
108mm Z direction.



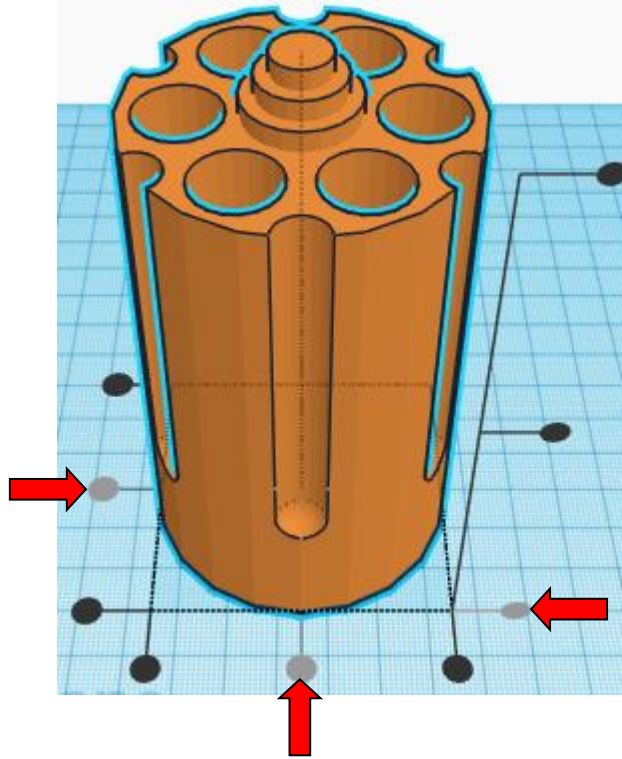
Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Cylinder Pin 3**.

Change the dimensions to
10mm X direction,
10mm Y direction, and
112mm Z direction.

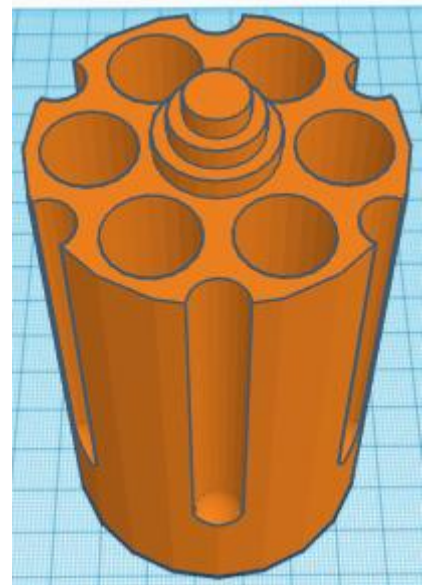


Align Cylinder and Cylinder Pin 1 and Cylinder Pin 2 and Cylinder Pin 3

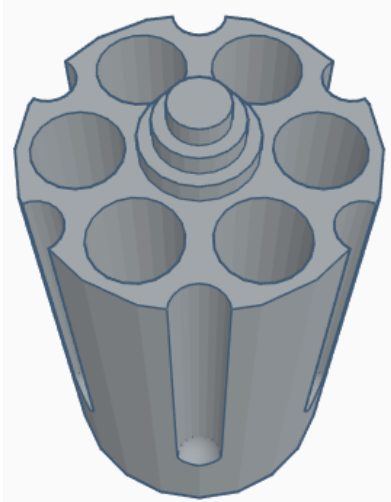
centered in X direction,
centered of Y direction, and
bottom of Z direction.



Group Cylinder and Cylinder Pin 1 and Cylinder Pin 2 and Cylinder Pin 3
From now on this will be called the **Cylinder**



**You're are done! Printing in grey seems to
Have the best results. Have fun!**

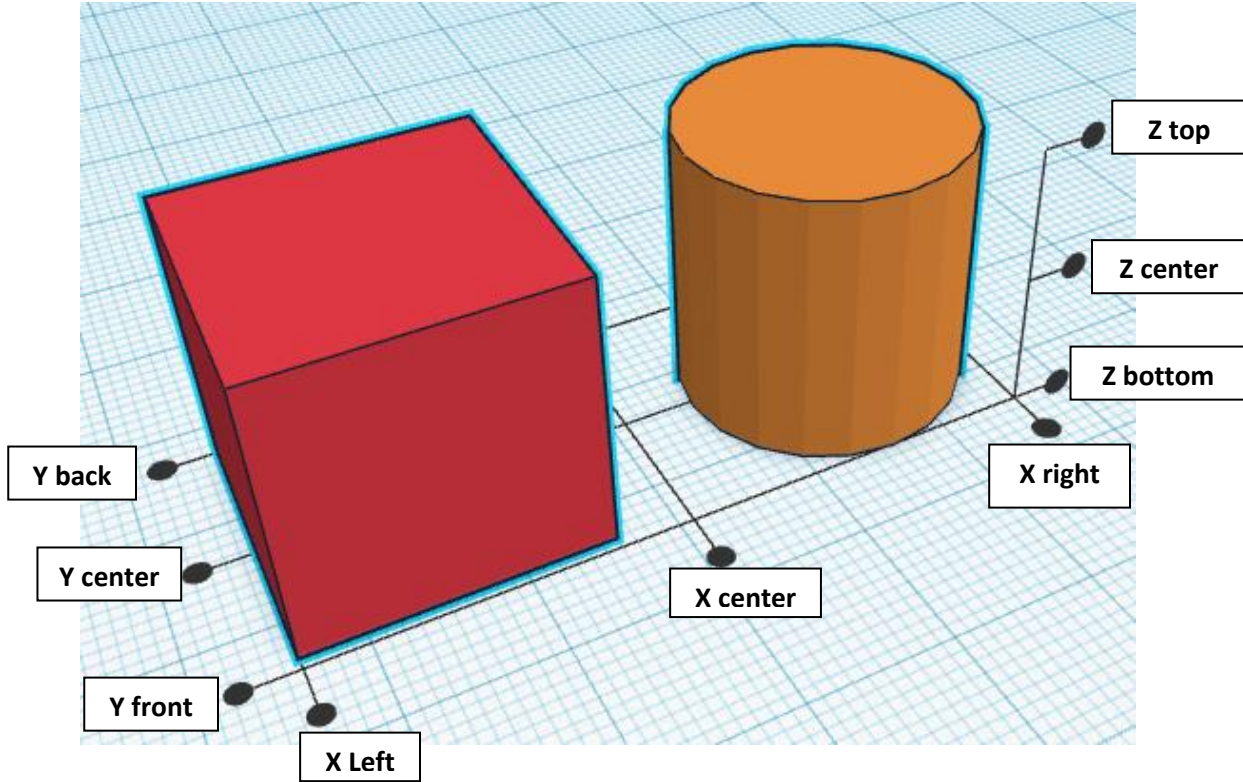


Reference to Aligning, Flip direction, Move direction, and Rotate direction.

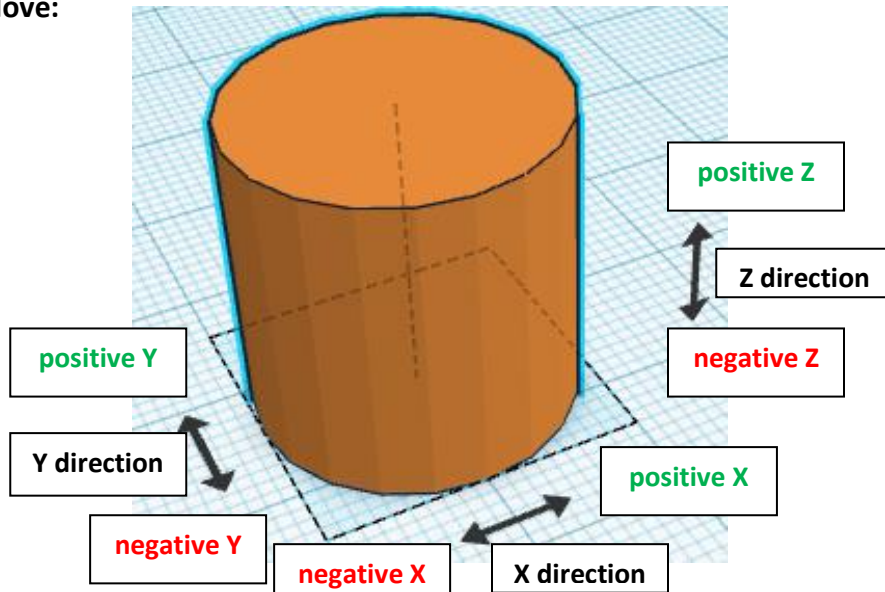
Always be in the "home view" when doing any of these!!!



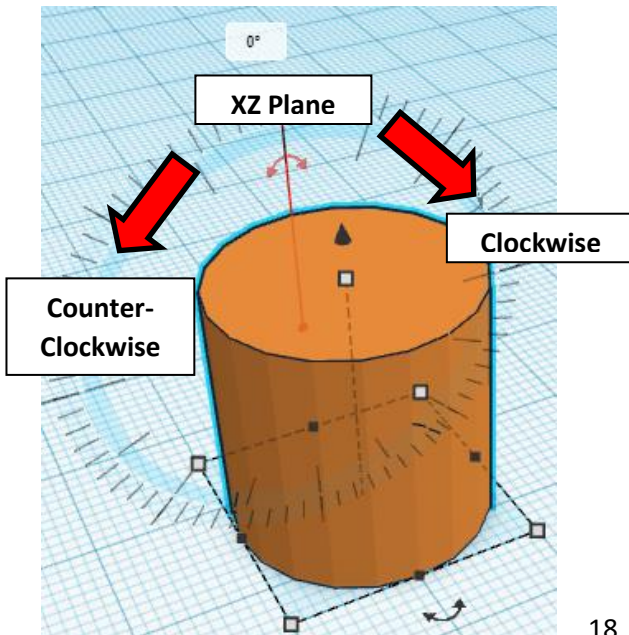
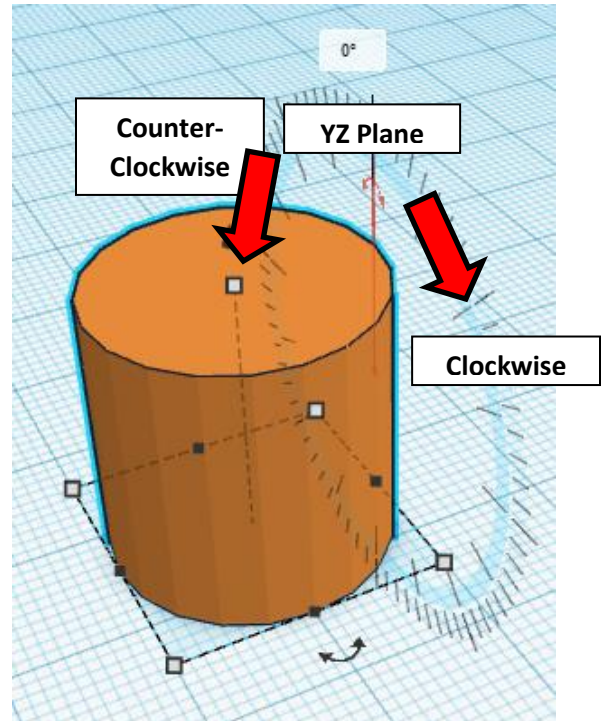
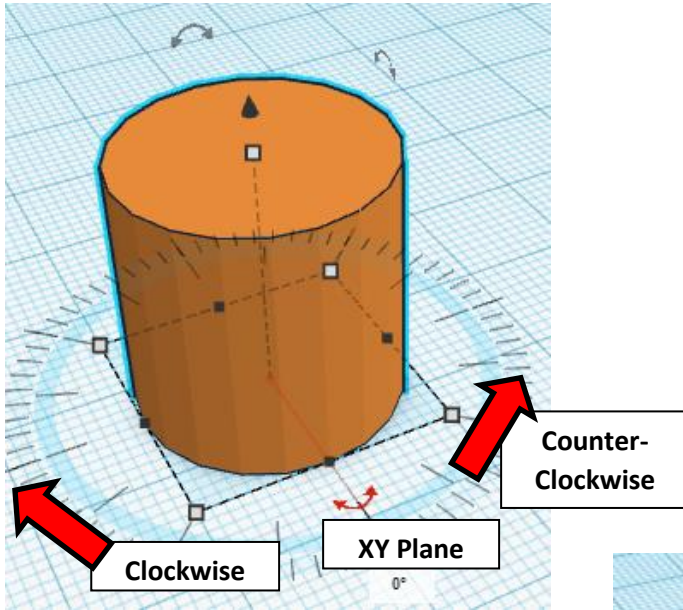
Aligning:



Flip or Mirror and Move:



Rotate:



Tool Guide

Most used Keyboard Shortcuts:

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

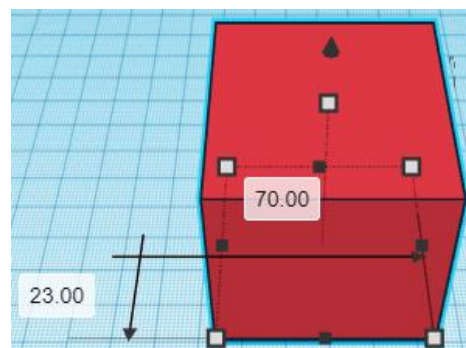
Moving Object(s):

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.

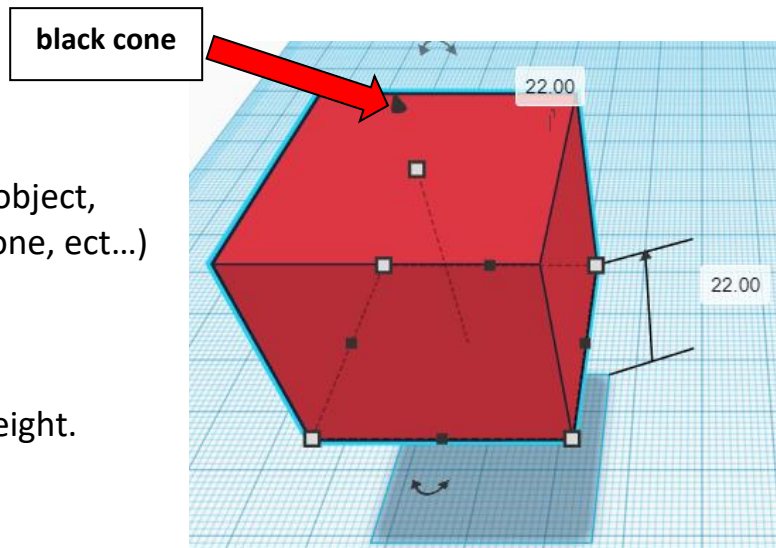


Moving Object(s) continued:

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.

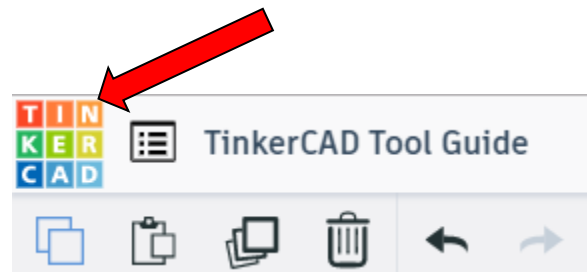


Hold control button and hold shift button and use up and down arrow keys to move the object in 10mm increments.

Using on screen icons:

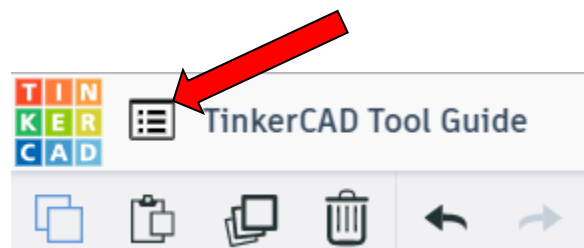
TinkerCAD main screen:

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



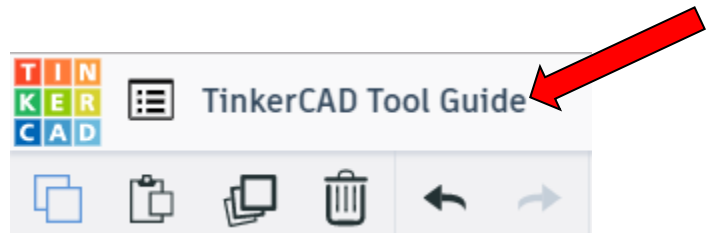
My designs:

Pulls up menu of your designs.



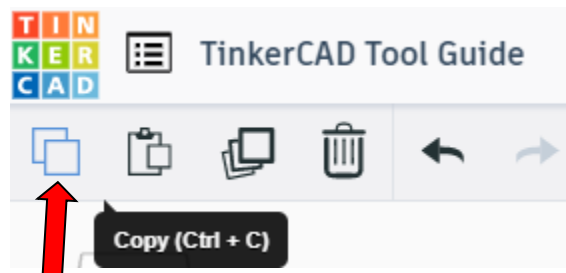
Design name:

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



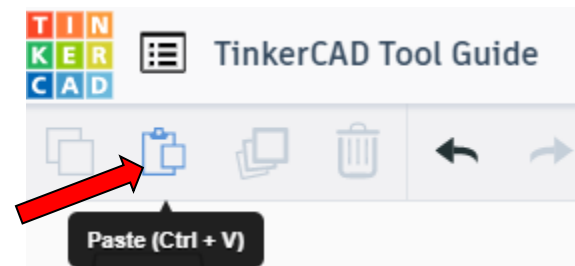
Copy:

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



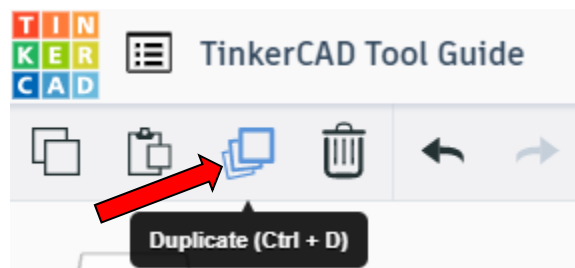
Paste:

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



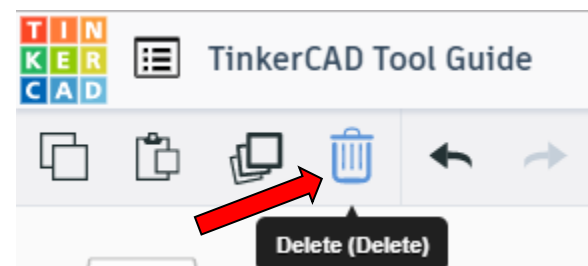
Duplicate:

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.



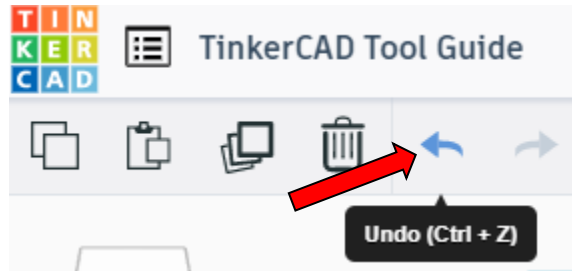
Delete:

Select shape.
Click delete or delete key.



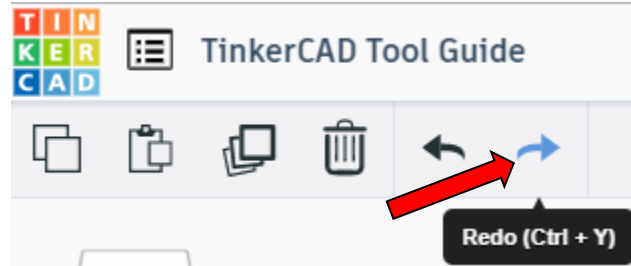
Undo:

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.



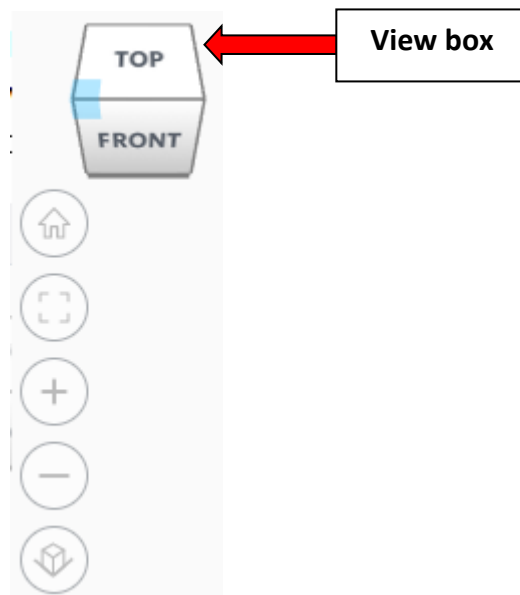
Change View:

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.

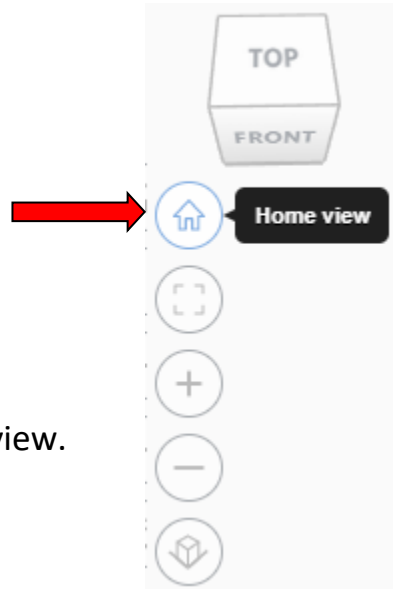


Change view to home view:

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.

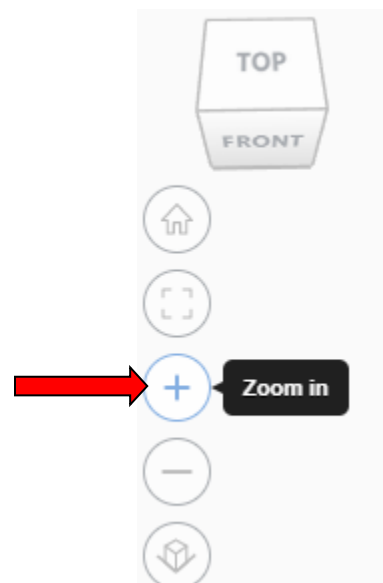
Fit one or more object(s) in view:

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).



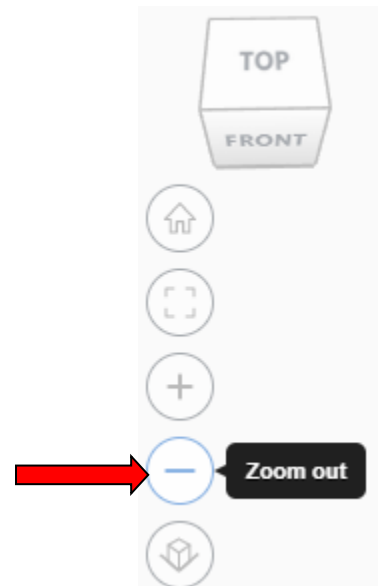
Zoom in:

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



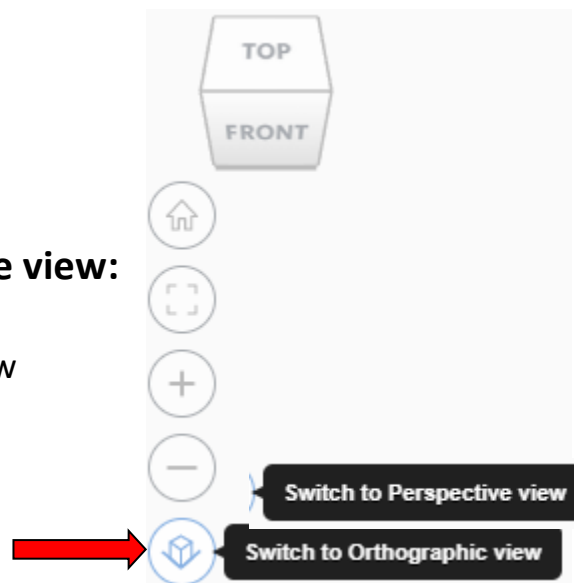
Zoom out:

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



Switching to orthographic and perspective view:

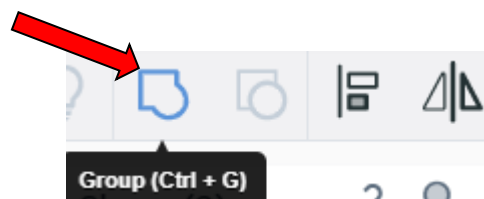
Click the Switch to orthographic/perspective view
To change to your preferred view.



Group:

To combine two or more objects into one object.

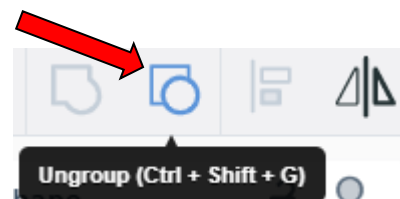
Select the objects to combine and click the
Group button or click ctrl + G



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.

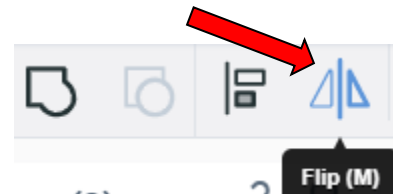
Select the objects to align and click the
align button or click "L"



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 object(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