TINKERCAD

Bird House

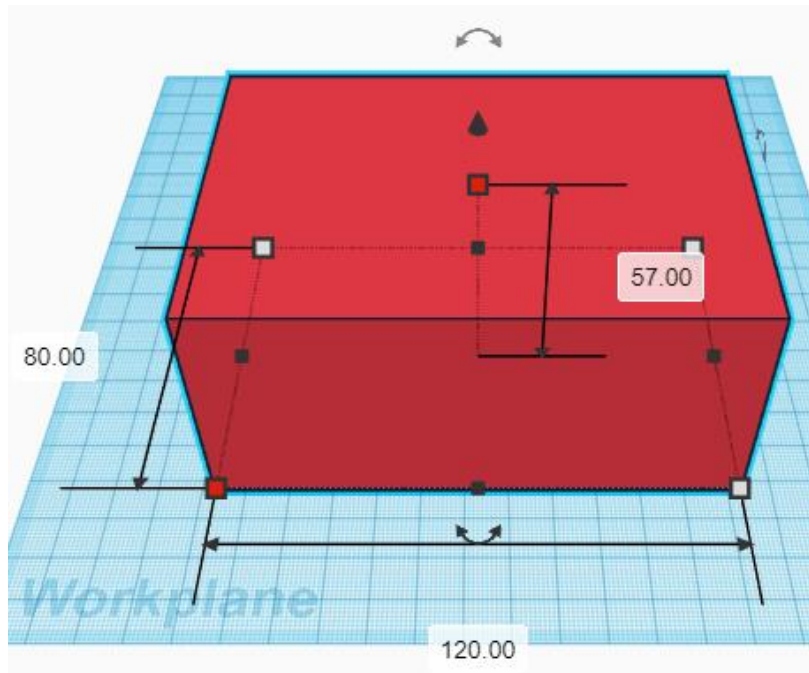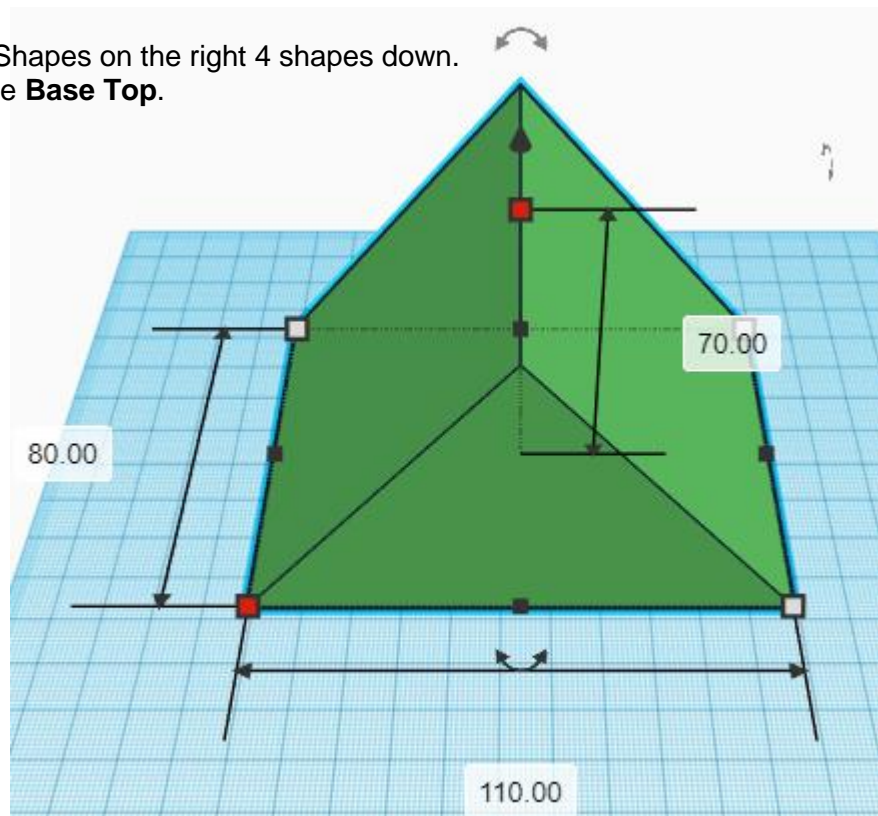# Project

Contents:

Bird House:

Base:

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

Change the dimensions to
120mm X direction,
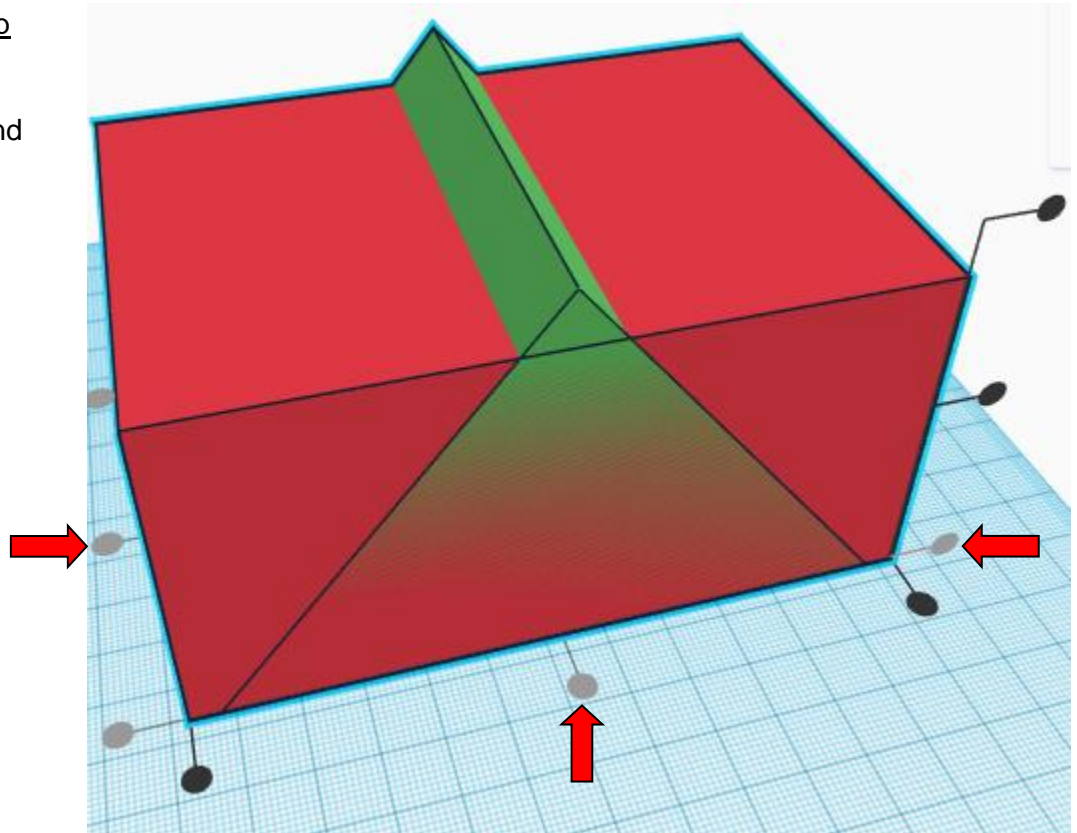80mm Y direction, and
57mm Z direction.

Bring in a Roof, located in Basic Shapes on the right 4 shapes down.
From now on this will be called the **Base Top**.

Change the dimensions to
110mm X direction,
80mm Y direction, and
70mm Z direction.

Align Base and Base Top

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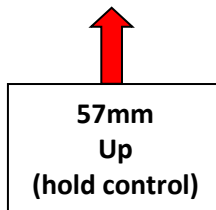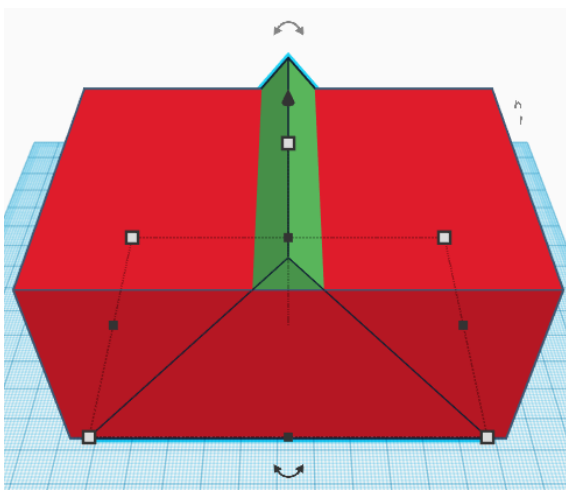bottom in Z direction.

Move Base Top   (Must be in home view for this to work!)
move Up in positive Z direction 57mm

Hint: Select Base Top and hold control and push up arrow key 57 times.
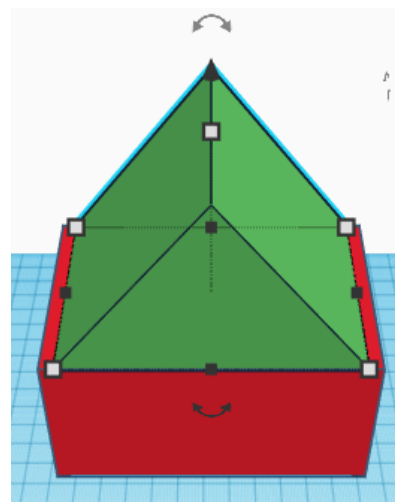   Or
        Select Base Top and hold control and hold shift and push up arrow key 5 times. Then release shift and
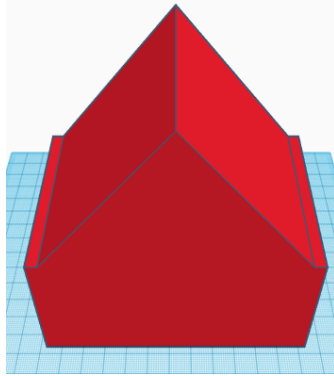   push up arrow key 7 more times.
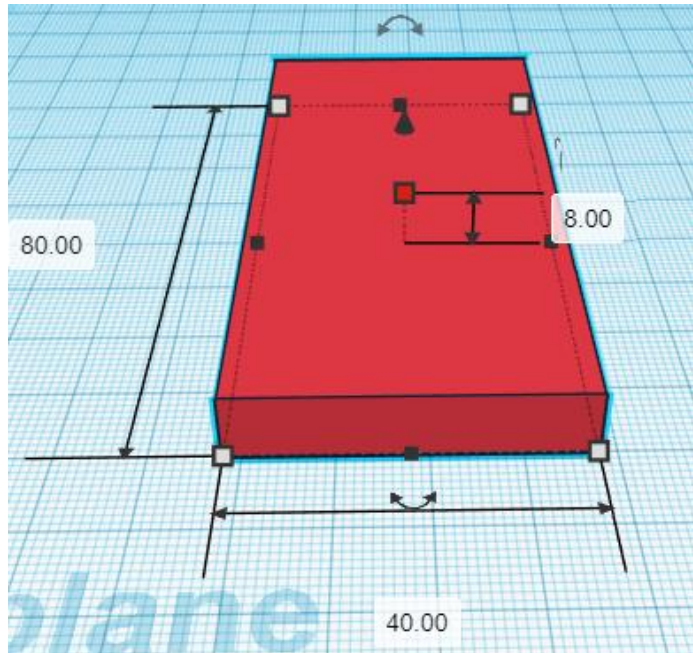
Before   After

57mm
Up
(hold control)

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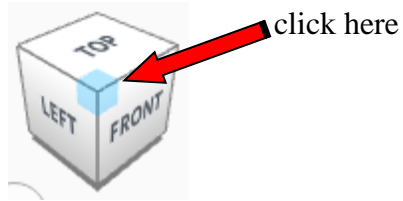

Roof:

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

Change the dimensions to
40mm X direction,
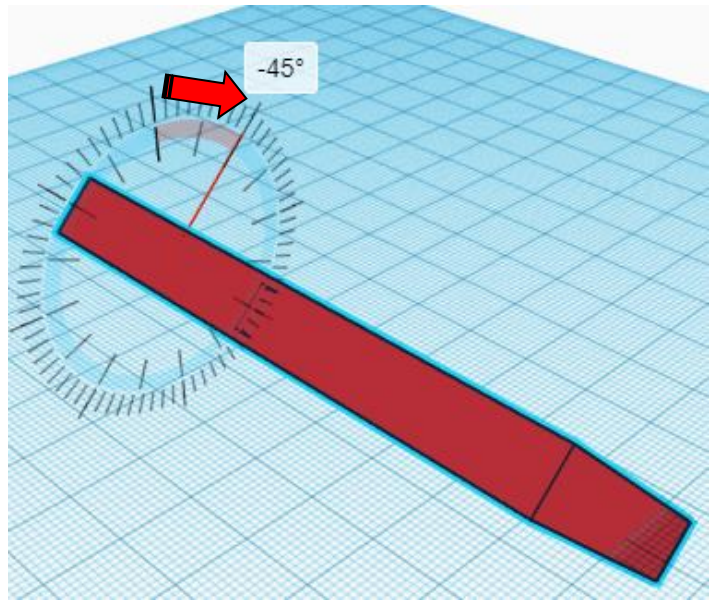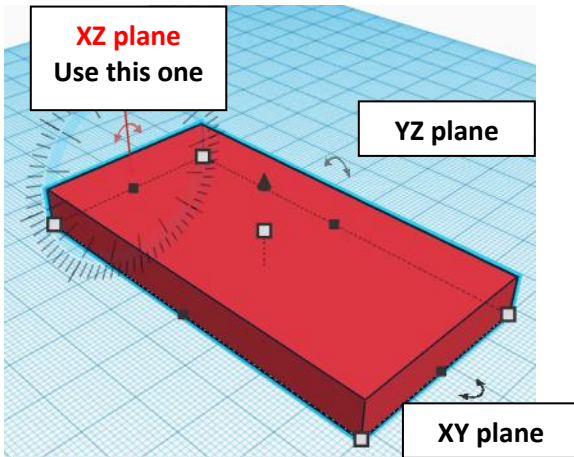80mm Y direction, and
8mm Z direction.

80.00

8.00

40.00

Go to TOP LEFT FRONT view for rotations click here

Rotate the Roof clockwise 45 degrees in XZ plane.

Before   After

XZ plane
Use this one

YZ plane

XY plane

-45°

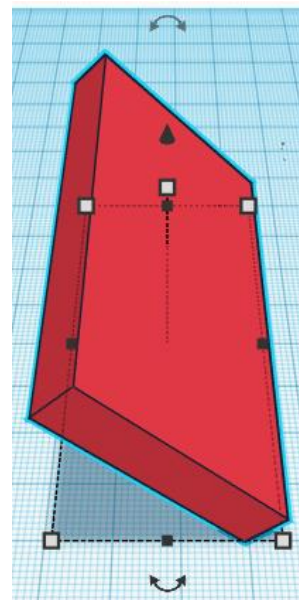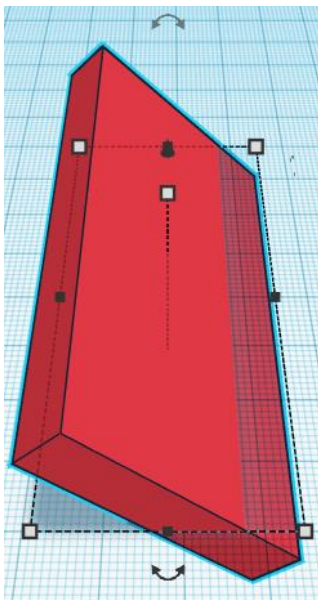**Set on Workplane:**

Select the Roof and type "d" to set the Roof on the work plane.

Before   After

Duplicate Roof 1 time
From now on this will be called the **Roof Middle**

Move Roof Middle   (Must be in home view for this to work!)
move Up in positive Z direction 25mm
and
move Left in negative X direction 18mm

Hint: Select Roof and hold control and push up arrow key 25 times.
   Or
   Select Roof and hold control and hold shift and push up arrow key 2 times. Then release shift and push up arrow 5 more times.
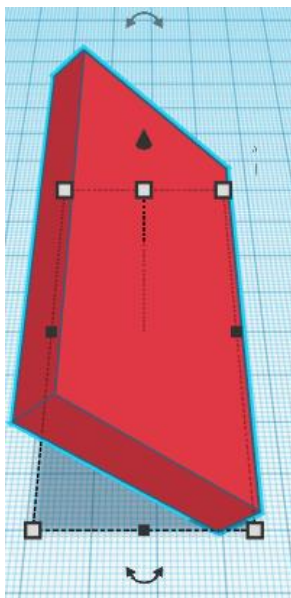   Then
   Select Roof and push left arrow key 18 times.
   Or
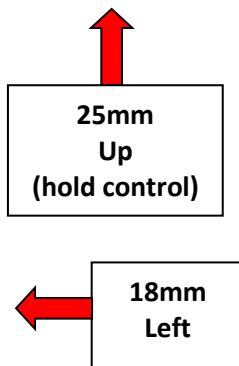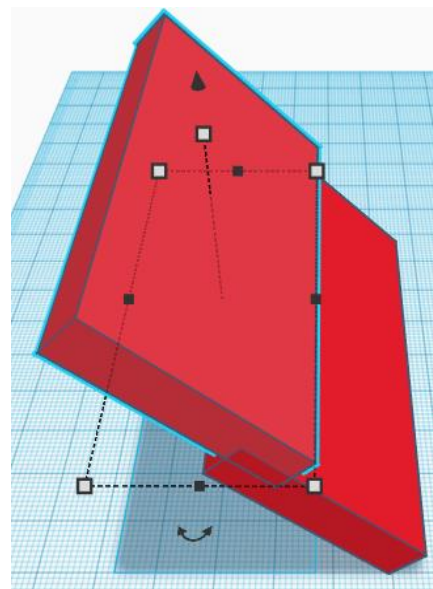   Select Roof and hold shift and push left arrow key 1 times. Then release shift and push left arrow 8 more times.
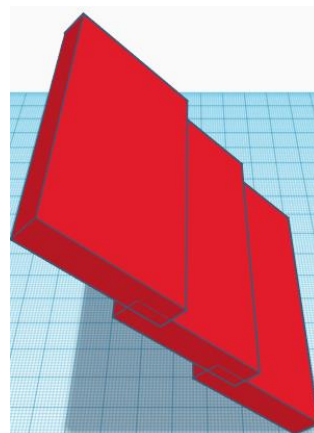
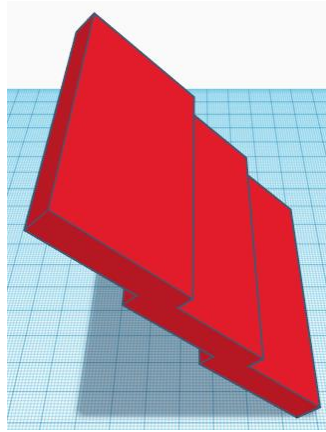Before   After

25mm
Up
(hold control)

18mm
Left

Immediately push ctrl-d to repeat this process.
(If you don't immediately push ctrl-d,
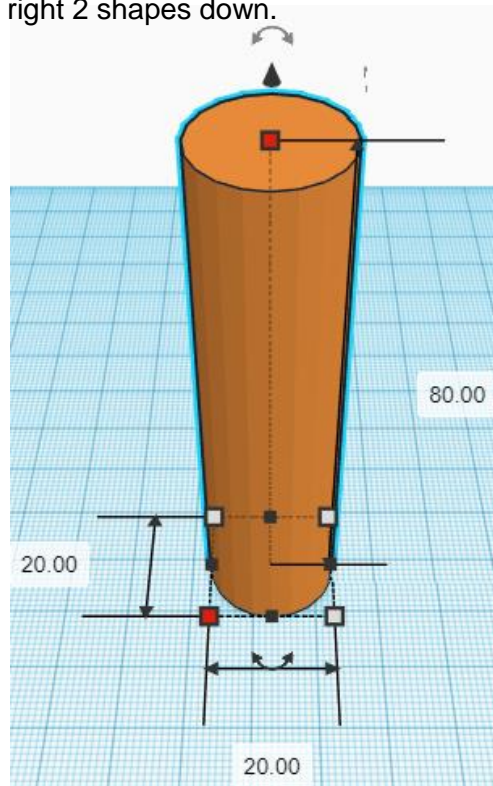then do the duplicate and move on the Roof Middle again.)

Group Roof and Roof Middles
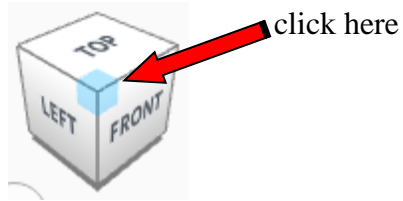From now on this will be called the **Roof**

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

Change the dimensions to
20mm X direction,
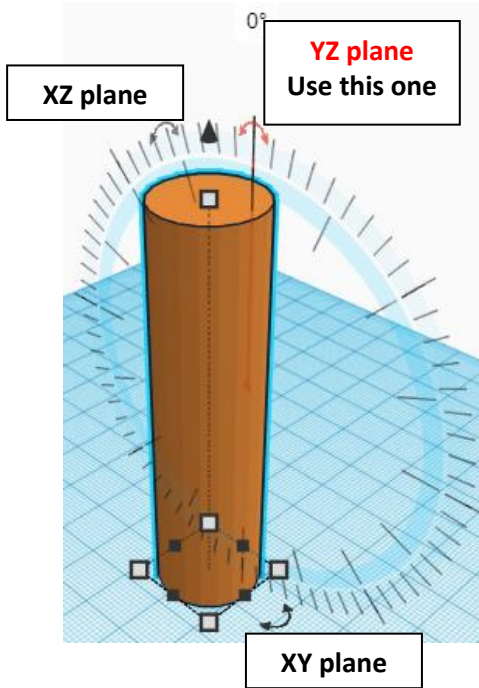20mm Y direction, and
80mm Z direction.

80.00

20.00
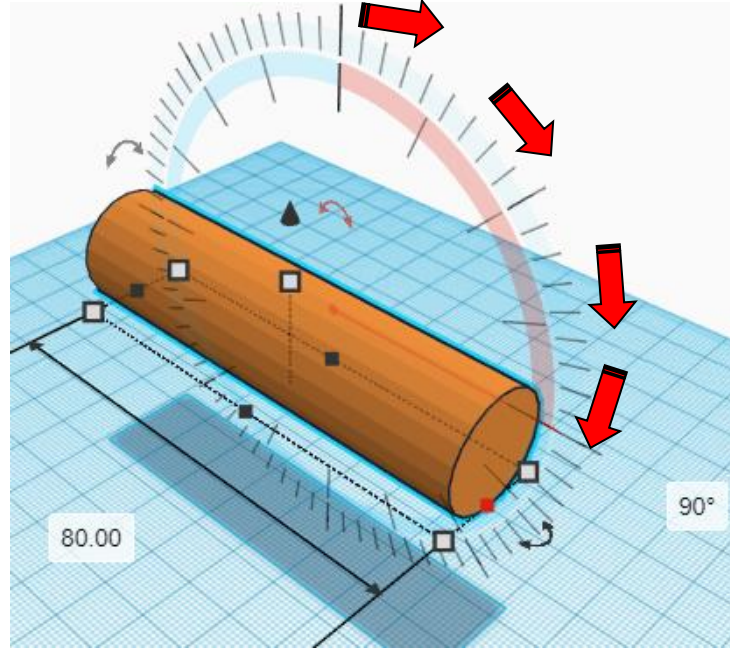
20.00

Go to TOP LEFT FRONT view for rotations   click here

Rotate the Roof Support clockwise 90 degrees in YZ plane.

Before   After

XZ plane

YZ plane
Use this one

0°

80.00

90°

XY plane

Set on Workplane:
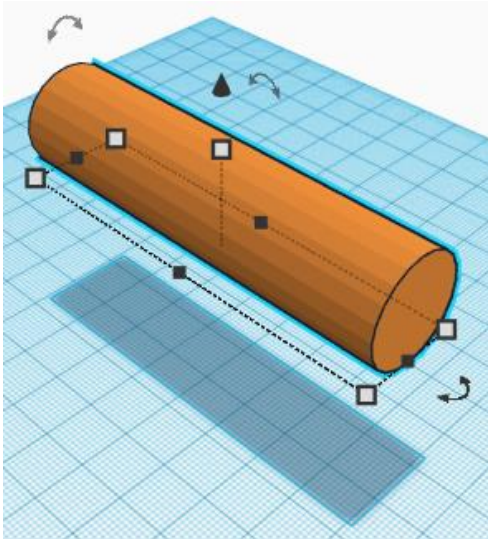
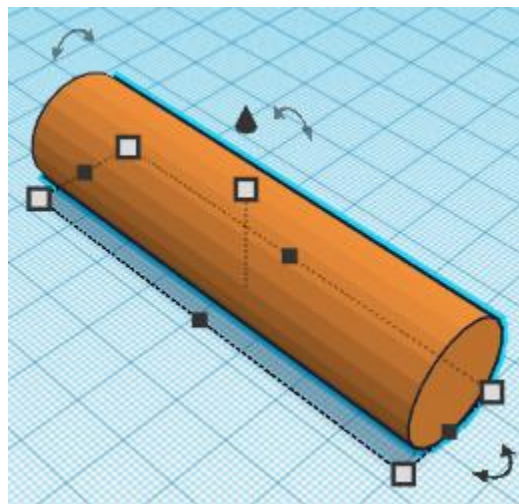Select the Roof Support and type "d" to set the Roof Support on the work plane.

Before   After
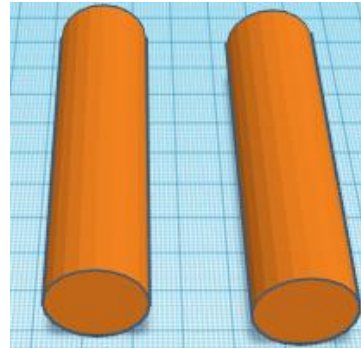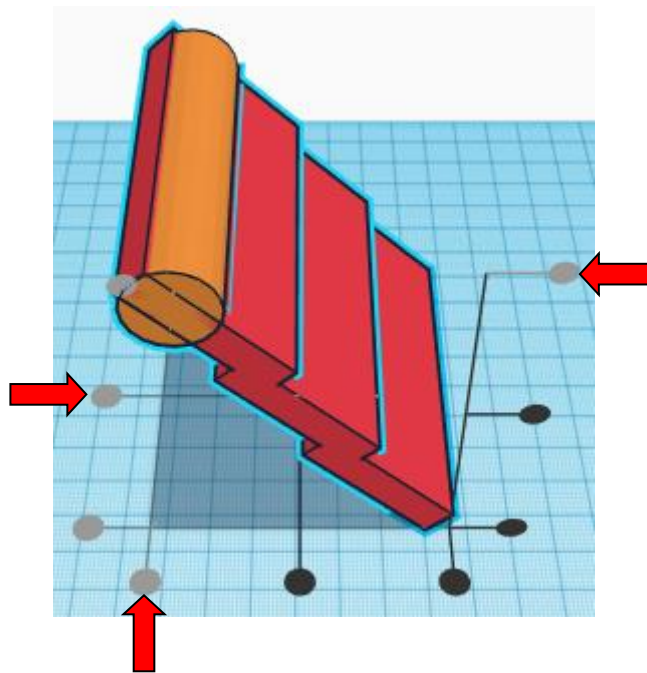
Duplicate <u>Roof Support</u> 1 time
From now on this will be called the **Top Roof Support**

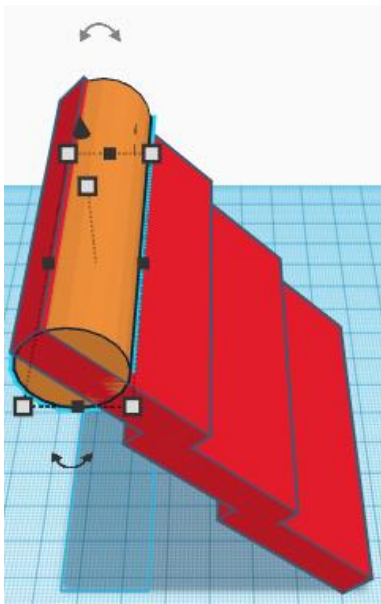**Align** <u>Roof</u> and <u>Top Roof Support</u>

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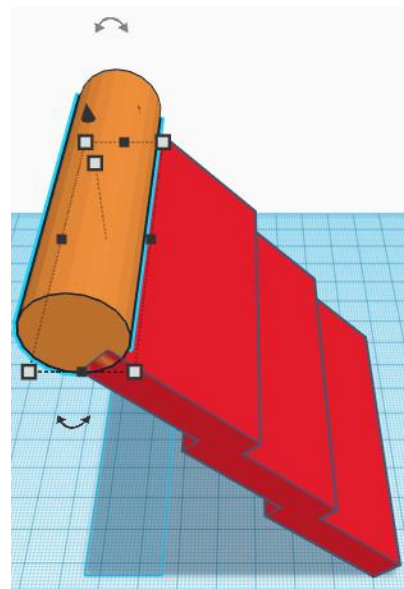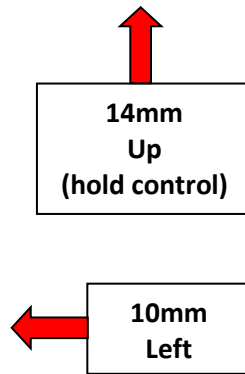centered in Y direction, and
top in Z direction.

Move Top Roof Support   (Must be in home view for this to work!)
move Up in positive Z direction 14mm
and
move Left in negative X direction 10mm

Hint: Select Top Roof Support and hold control and push up arrow key 14 times.
          Or
          Select Top Roof Support and hold control and hold shift and push up arrow key 1 time. Then release
          shift and push up arrow 4 more times.
          Then
          Select Top Roof Support and push left arrow key 10 times.
          Or
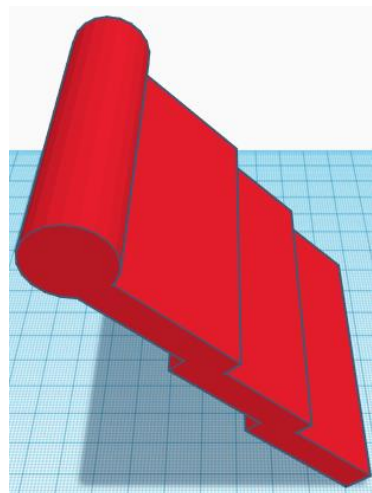   Select Top Roof Support and hold shift and push left arrow key 1 times.
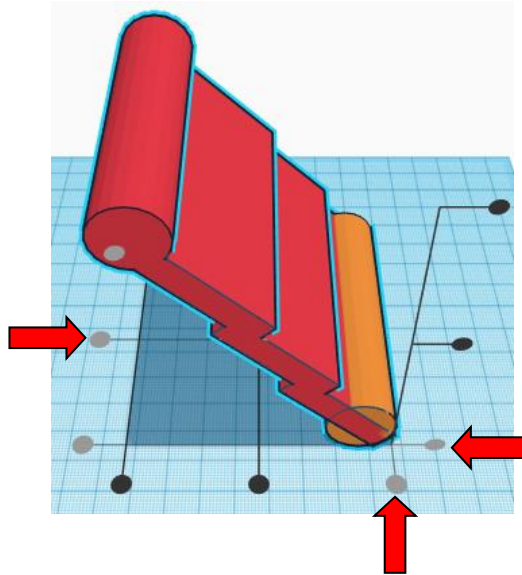

Before   After

14mm
Up
(hold control)

10mm
Left

Group Roof and Top Roof Support
From now on this will be called the **Roof**

Align <u>Roof</u> and <u>Roof Support</u>

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

Move <u>Roof Support</u>   (Must be in home view for this to work!)
move Down in negative Z direction 7mm
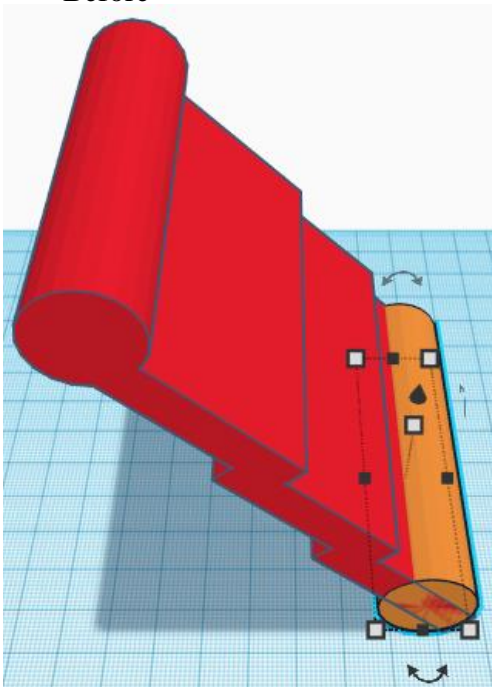and
move Left in negative X direction 3mm

Hint: Select <u>Roof Support</u> and hold control and push down arrow key 7 times.
          Then
          Select <u>Roof Support</u> and push left arrow key 3 times.
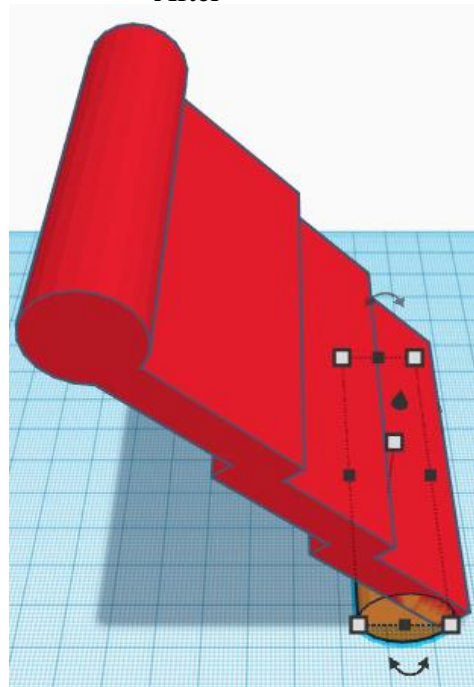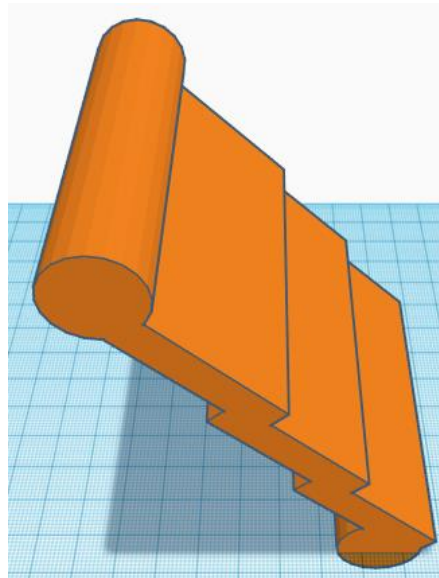
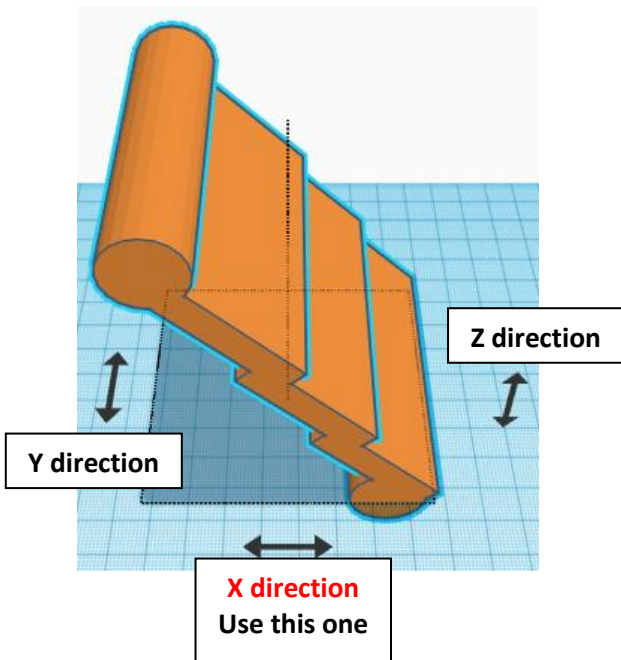Before   After

7mm
Down
(hold control)

3mm
Left

Group Roof and Roof Support
From now on this will be called the **Roof**

Duplicate Roof 1 time

Flip Roof in X direction.

Before   After

Z direction

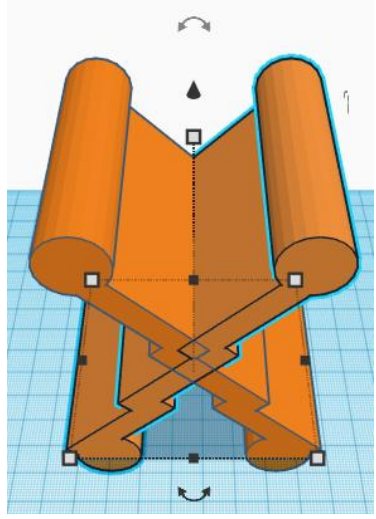Y direction

X direction
Use this one
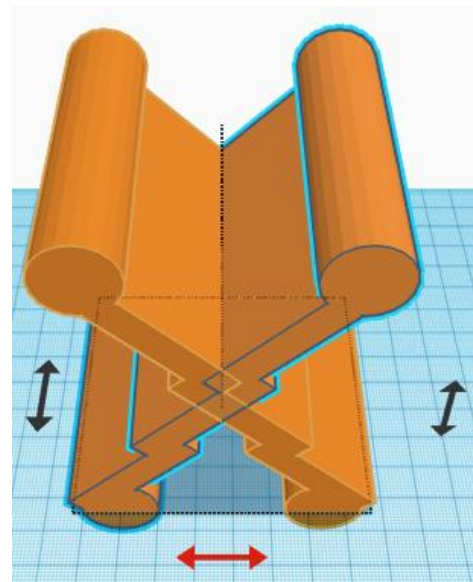
From now on this flipped shape will be called **Left Roof**
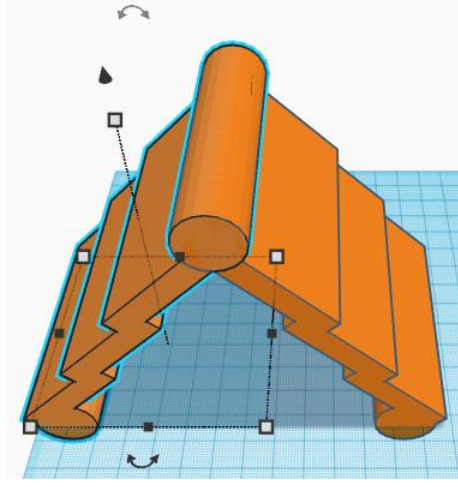
Move Left Roof   (Must be in home view for this to work!)
move Left in negative X direction 60mm

Hint: Select Left Roof and push left arrow key 60 times.
         or
         Select Left Roof and hold shift and push left arrow key 6 times.

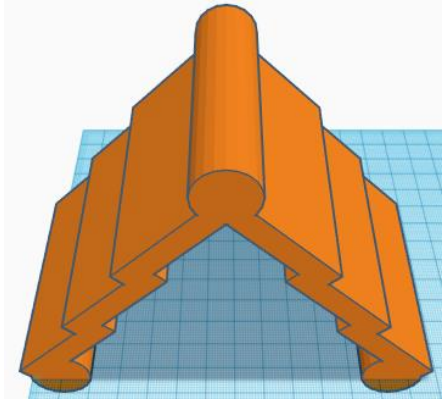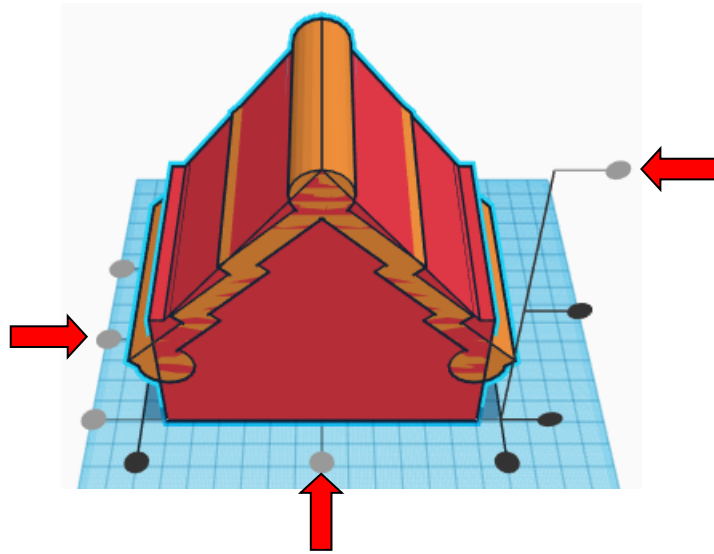Before   After

60mm
Left

Group Roof and Left Roof
From now on this will be called the **Roof**

Align Roof and Base

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

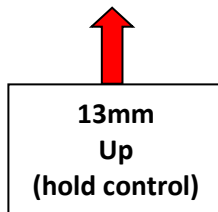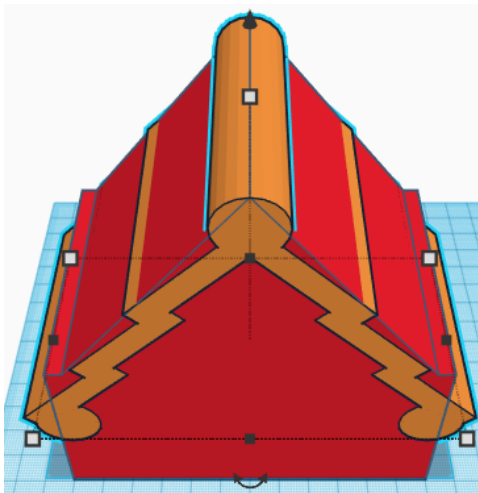**Move** Roof   (Must be in home view for this to work!)
move Up in positive Z direction 13mm

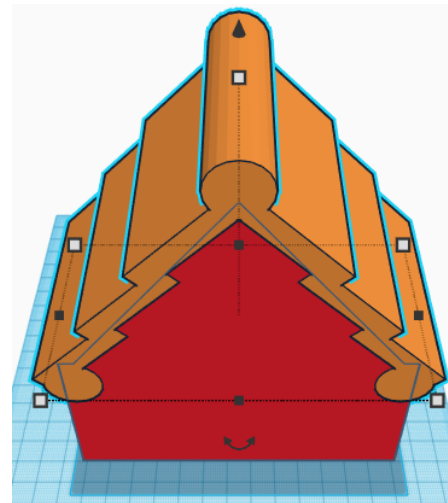**Hint:** Select Roof and hold control and push up arrow key 13 times.
or
Select Roof and hold control and hold shift and push up arrow key 1 time. Then release shift and push up arrow key 3 more times.
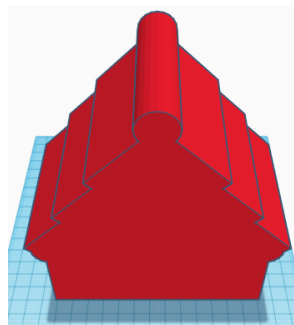
Before

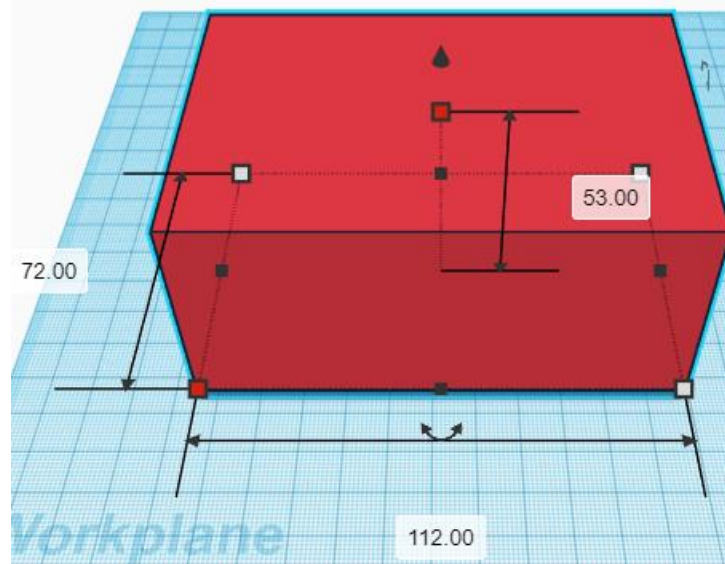After

13mm
Up
(hold control)

Group Roof and Base
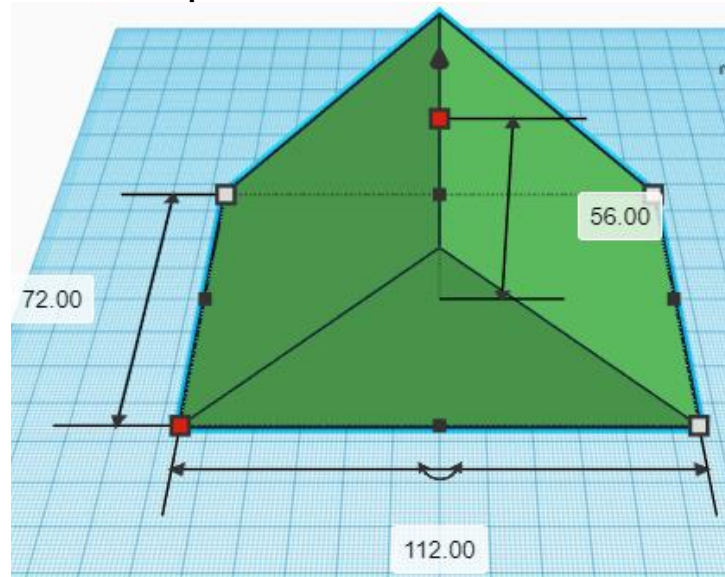From now on this will be called the **Base**

15

Base Cutout:

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

Change the dimensions to
112mm X direction,
72mm Y direction, and
53mm Z direction.

Bring in a Roof, located in Basic Shapes on the left 4 shapes down.
From now on this will be called the **Base Cutout Top**.

Change the dimensions to
112mm X direction,
72mm Y direction, and
56mm Z direction.

Bring in a MetaFillet, located in All, (things in All move each time that TinkerCad adds items to All), this was last seen on page 11, on the bottom left.
From now on this will be called the **Roof Cutoff**

Change the dimensions to
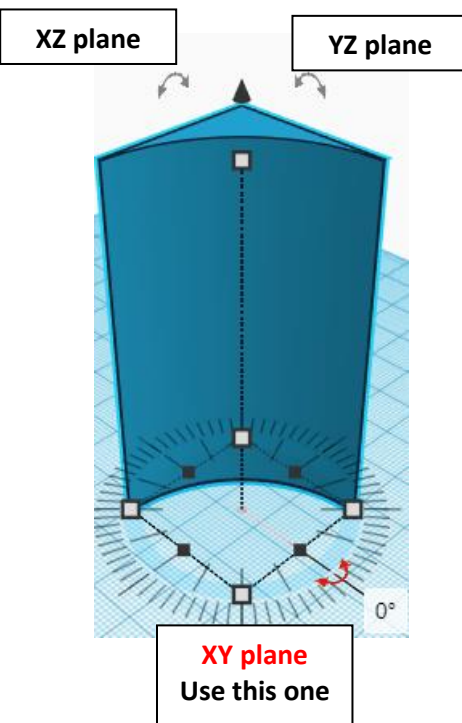30mm X direction,
30mm Y direction, and
72mm Z direction.
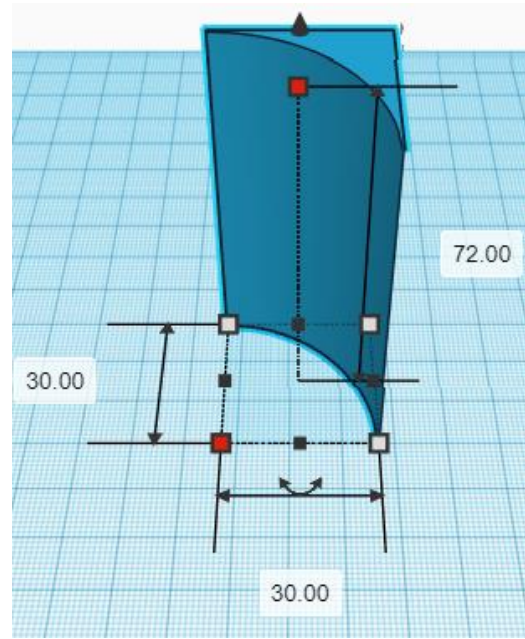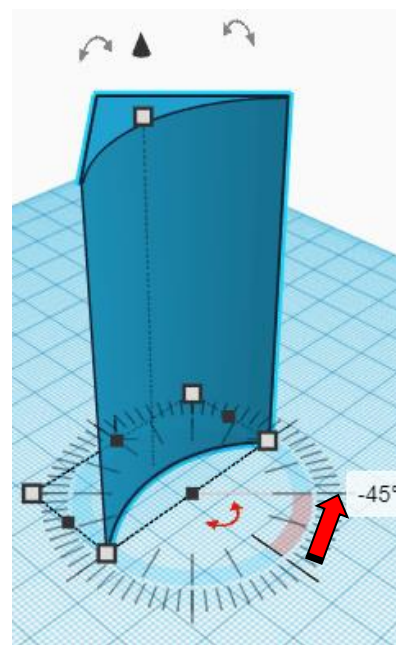

Go to TOP LEFT FRONT view for rotations click here
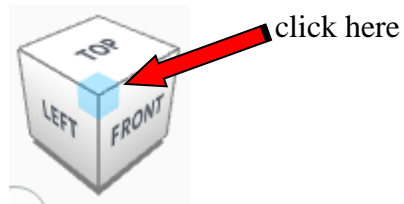
Rotate the Roof Cutoff counter-clockwise 45 degrees in XY plane.

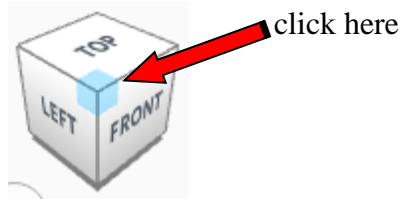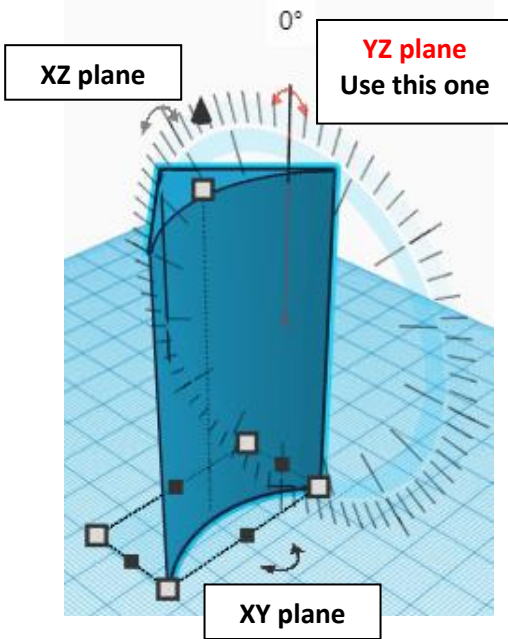Before   After

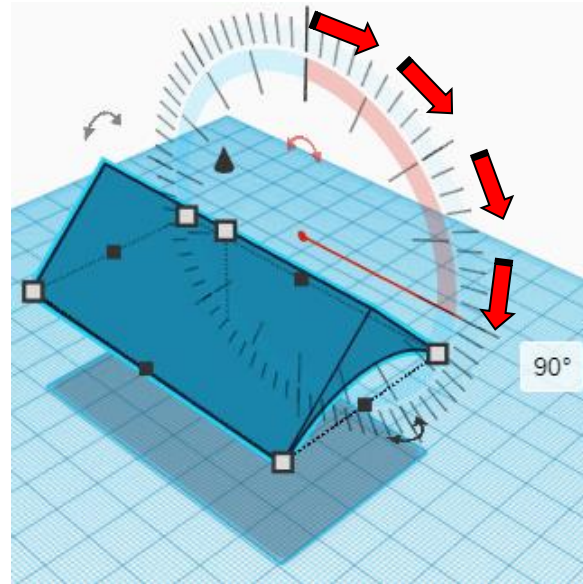Go to TOP LEFT FRONT view for rotations ◢ click here

Rotate the <u>Roof Cutoff</u> clockwise 90 degrees in YZ plane.

Before

After

XZ plane

YZ plane
Use this one

0°

90°

XY plane
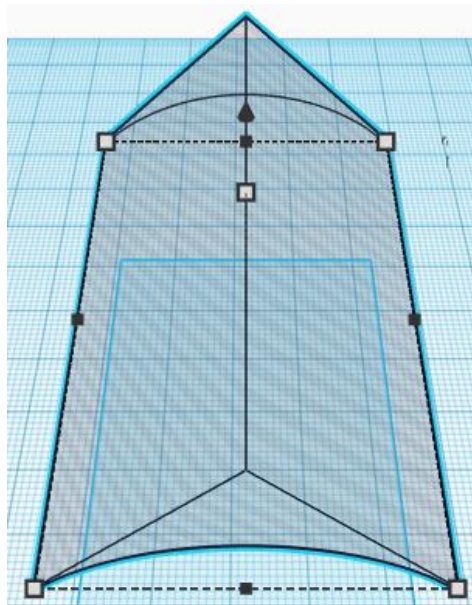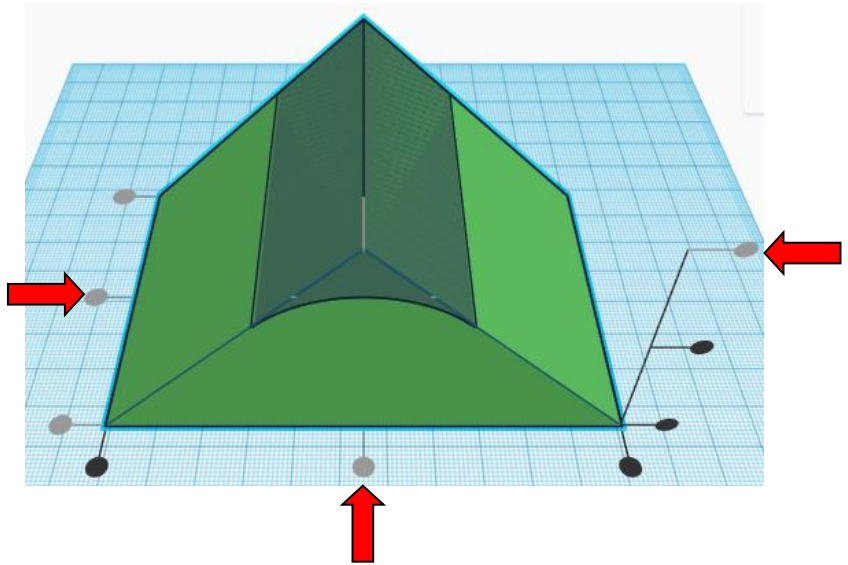
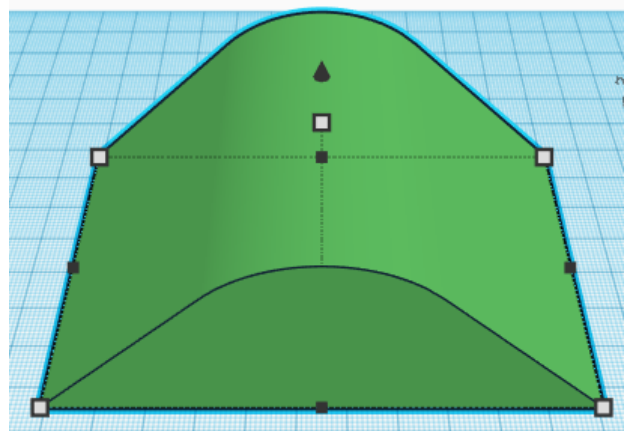**Change** <u>Roof Cutoff</u> to **Hole** by selecting <u>Roof Cutoff</u> and typing "h".

Align Base Cutout Top and Roof Cutoff

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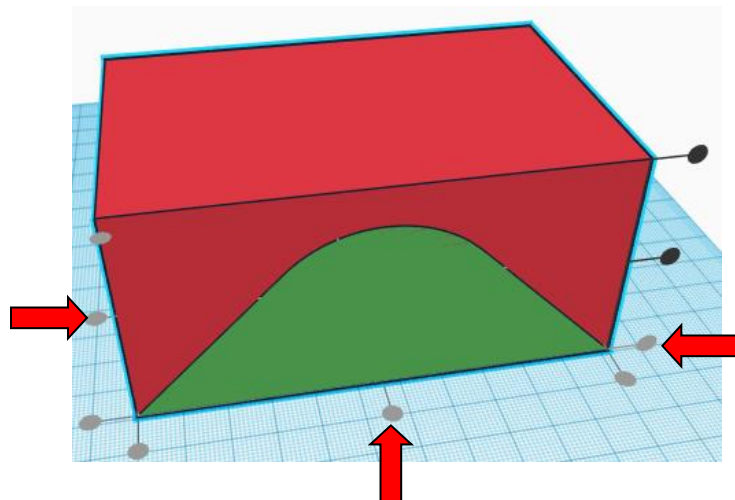centered in Y direction, and
top in Z direction.

Group Base Cutout Top and Roof Cutoff
From now on this will be called the **Base Cutout Top**

Align Base Cutout Top and Base Cutout

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

It is easier to select the Base cutout rather than the Base Cutout Top, we will select the base cutout and move it.

Move Base Cutout   (Must be in home view for this to work!)
move Down in negative Z direction 53mm

Hint: Select Base Cutout and hold control and push down arrow key 53 times.
         or
         Select Base Cutout and hold control and hold shift and push down arrow key 5 times. Then release shift
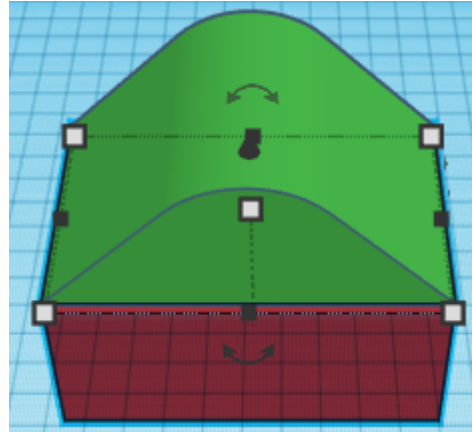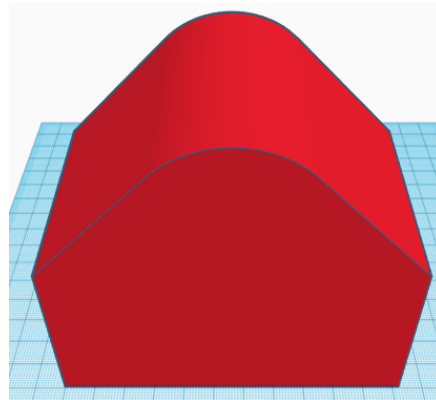   and push down arrow key 3 more times.

Before   After
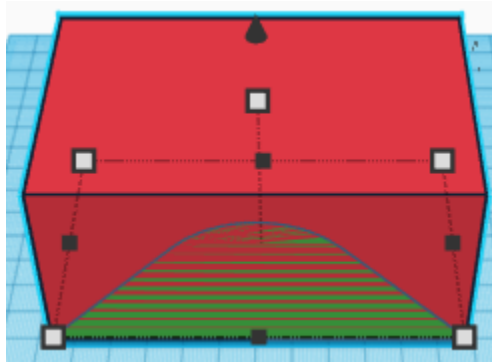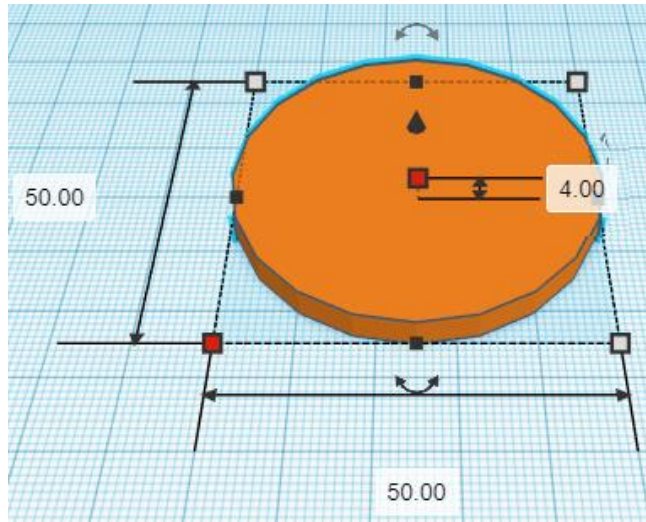

53mm
Down
(hold control)

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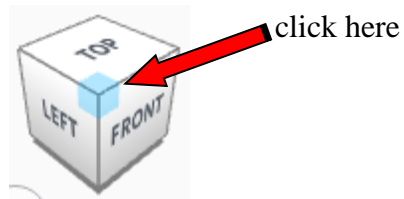From now on this will be called the **Base Cutout**

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

Change the dimensions to
50mm X direction,
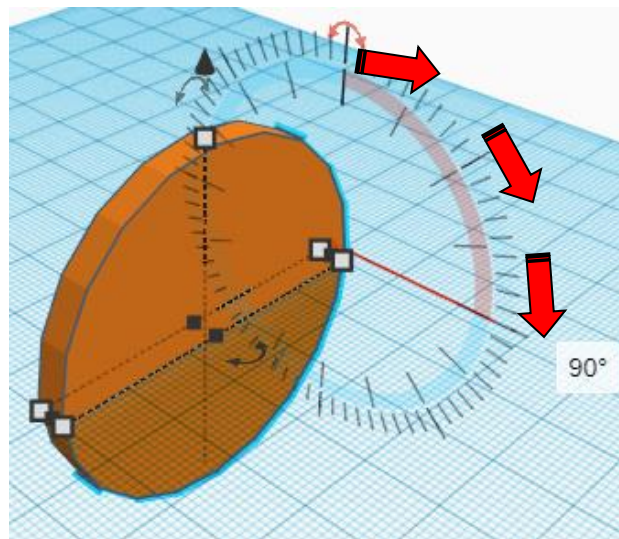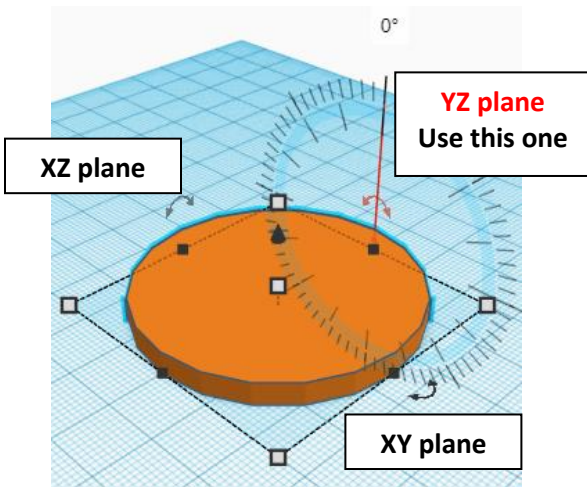50mm Y direction, and
4mm Z direction.

Go to TOP LEFT FRONT view for rotations click here

Rotate the Door Cutout clockwise 90 degrees in YZ plane.

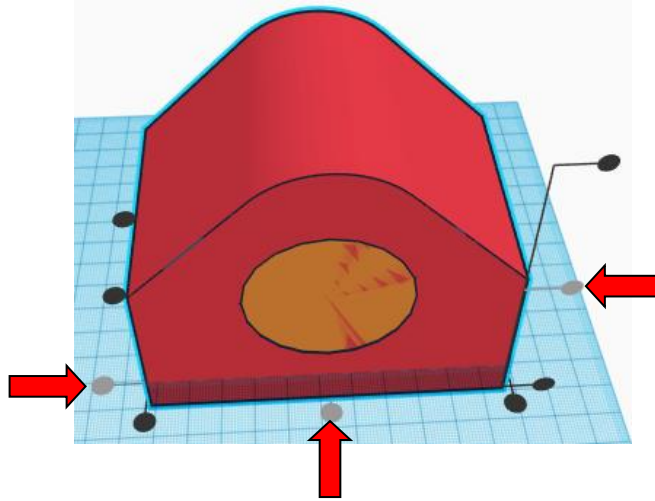Before   After

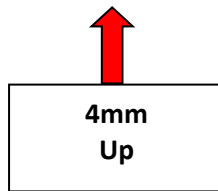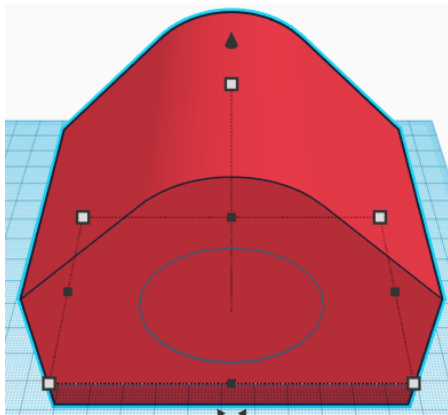**Align** <u>Base Cutout</u> and <u>Door Cutout</u>

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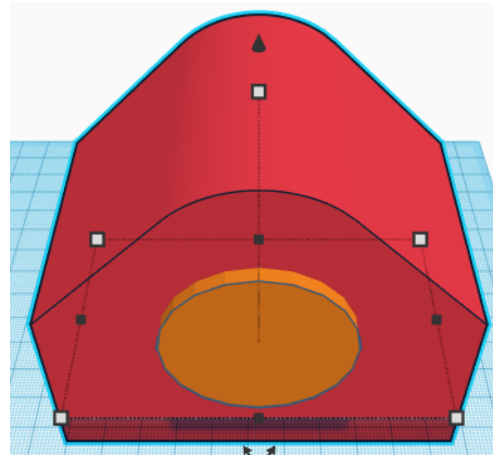centered in Z direction.

Move <u>Base Cutout</u>   (Must be in home view for this to work!)
move Back in positive Y direction 4mm

Hint: Select <u>Base Cutout</u> and push up arrow key 4 times.
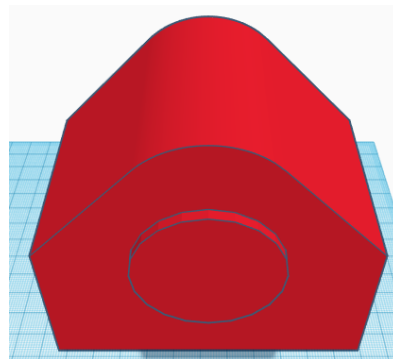
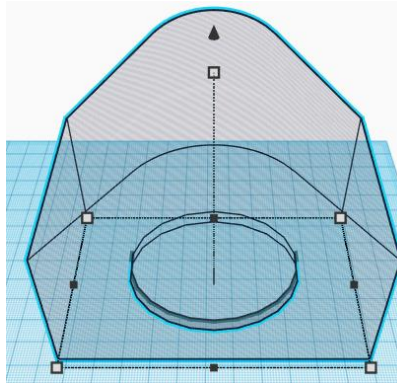Before

After

4mm
Up

Group <u>Base Cutout</u> and <u>Door Cutout</u>
From now on this will be called the **Base Cutout**
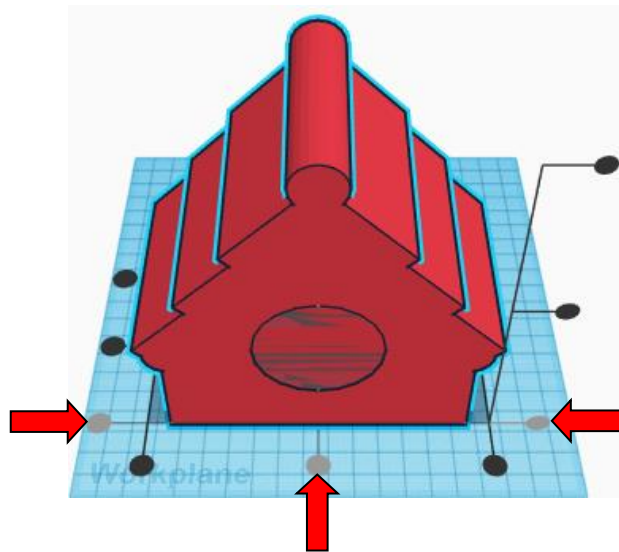
Change <u>Base Cutoff</u> to **Hole** by selecting <u>Base Cutoff</u> and typing "h".

Align <u>Base Cutout</u> and <u>Base</u>

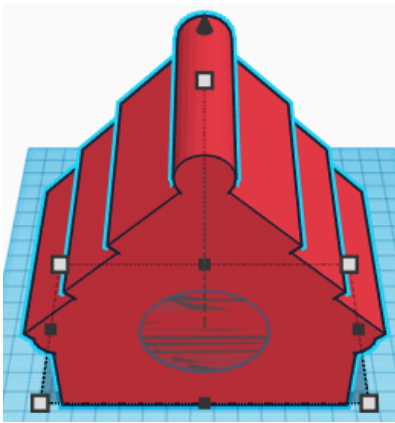centered in X direction, front in Y direction, and bottom in Z direction.

It is easier to select the Base rather than the Base Cutout, we will select the base and move it.

Move Base   (Must be in home view for this to work!)
move Down in negative Z direction 4mm

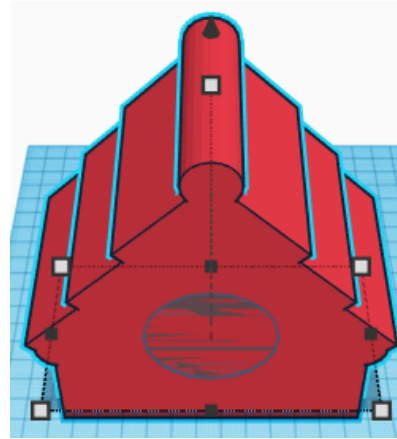**Hint:**   Select Base and hold control and push down arrow key 4 times.
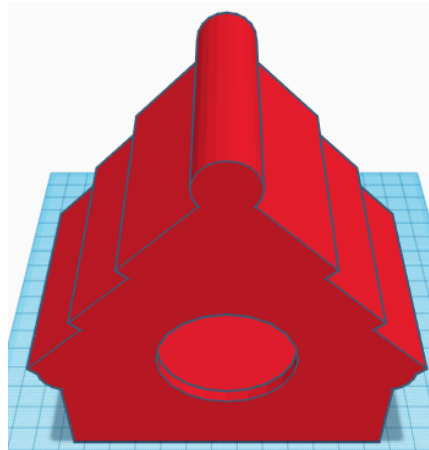
Before   After
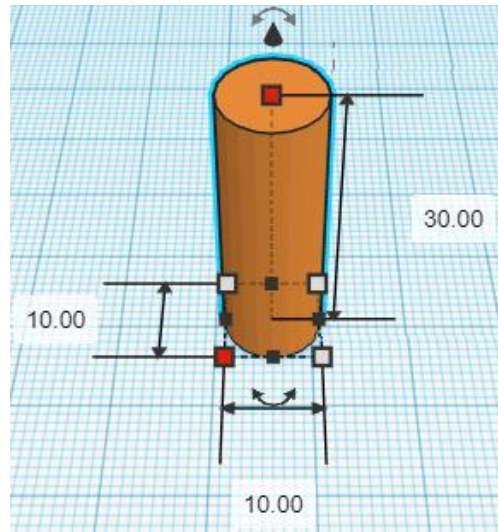

4mm
Down
(hold control)

Group Base Cutout and Base
From now on this will be called the **Bird House**
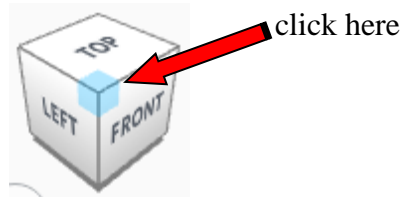
Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Hanging Hole**.

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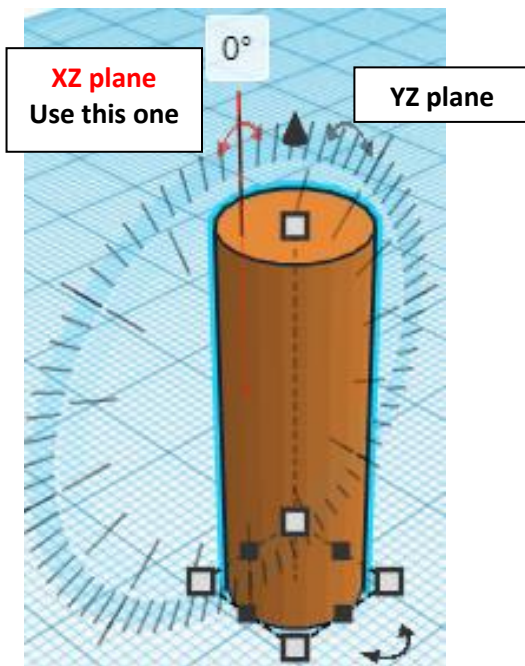10mm Y direction, and
30mm Z direction.
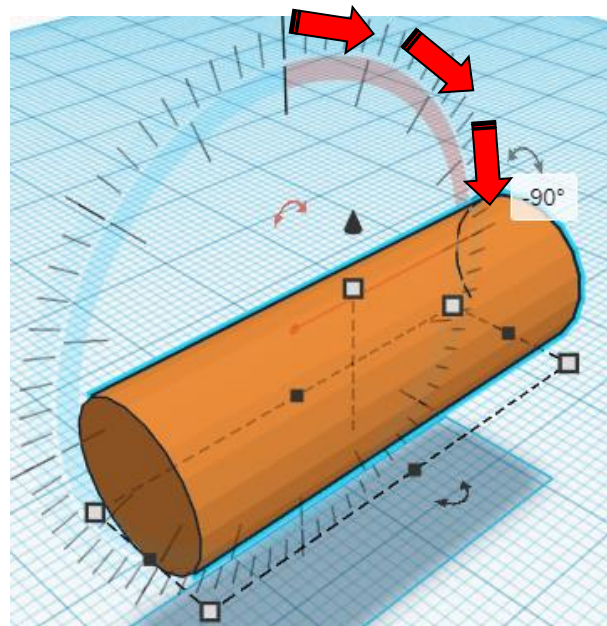

Go to TOP LEFT FRONT view for rotations click here

Rotate the Hanging Hole clockwise 90 degrees in XZ plane.

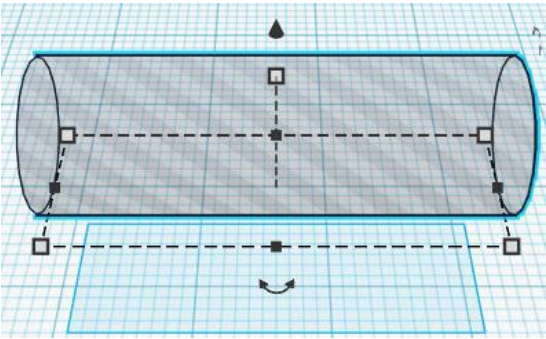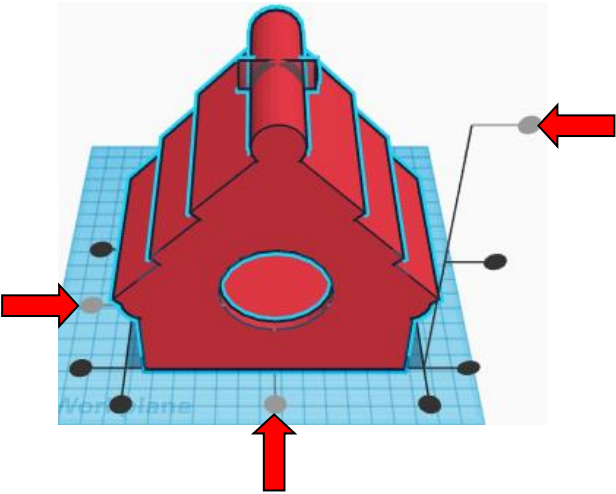Before   After

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

Align Bird House and Hanging Hole

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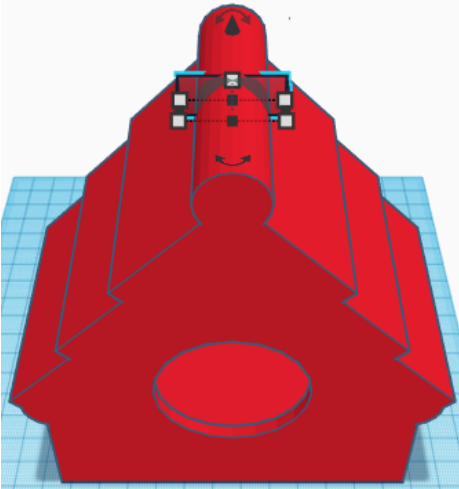top in Z direction.

Move Hanging Hole   (Must be in home view for this to work!)
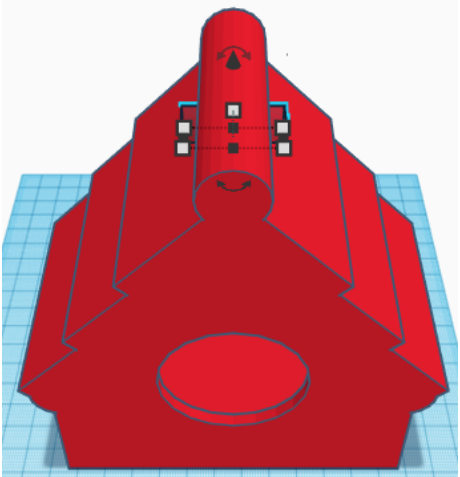move Down in negative Z direction 10mm

Hint: Select Hanging Hole and hold control and push down arrow key 10 times.
Or
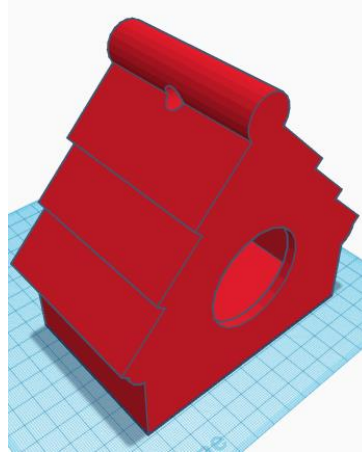Select Hanging Hole and hold control and hold shift and push down arrow key 1 time.

Before   After

10mm
Down
(hold control)

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Group Bird House and Hanging Hole
From now on this will be called the **Bird House**

Perch:

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

Change the dimensions to
4mm X direction,
60mm Y direction, and
20mm Z direction.
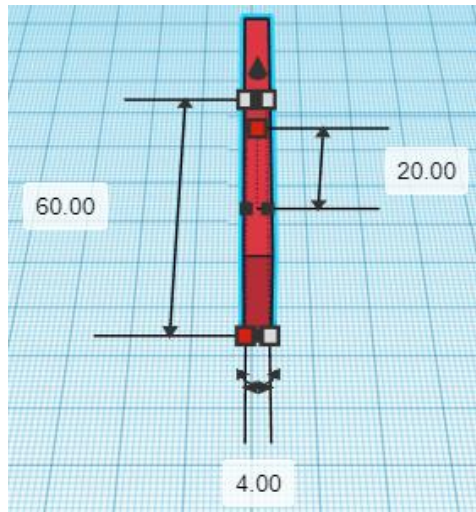
Bring in a Cylinder, located in Basic Shapes on the right 2 shapes down.
From now on this will be called the **Perch**.

Change the dimensions to
10mm X direction,
10mm Y direction, and
60mm Z direction.

Go to TOP LEFT FRONT view for rotations

click here
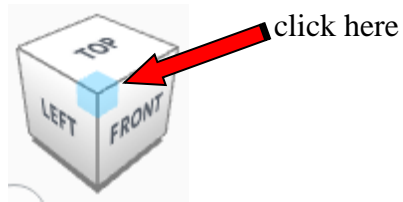
Rotate the Perch clockwise 90 degrees in YZ plane.

Before   After

XZ plane

YZ plane
Use this one

0°

XY plane

90°

Align Perch Support and Perch

centered in X direction,
centered in Y direction, and
top in Z direction.
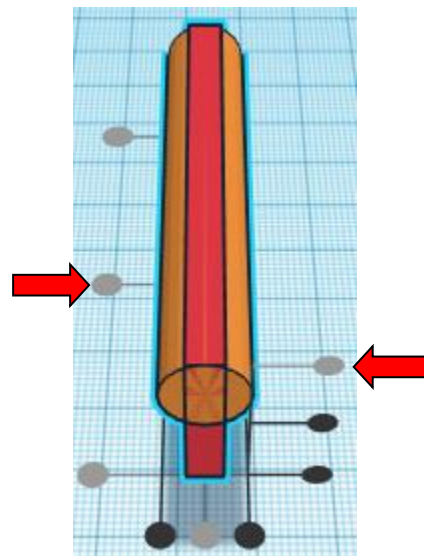
Move Perch   (Must be in home view for this to work!)
move Up in positive Z direction 8mm

Hint: Select Hanging Hole and hold control and push down arrow key 8 times.

Before   After
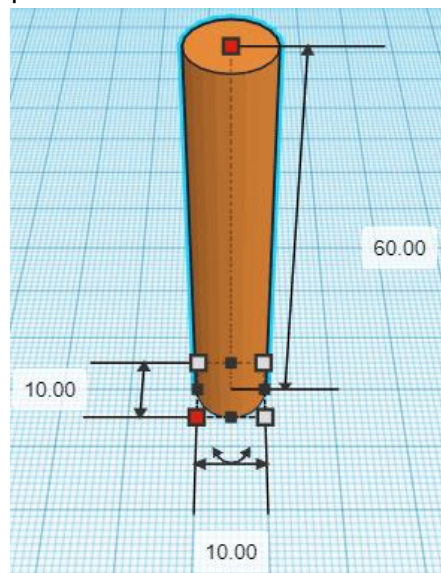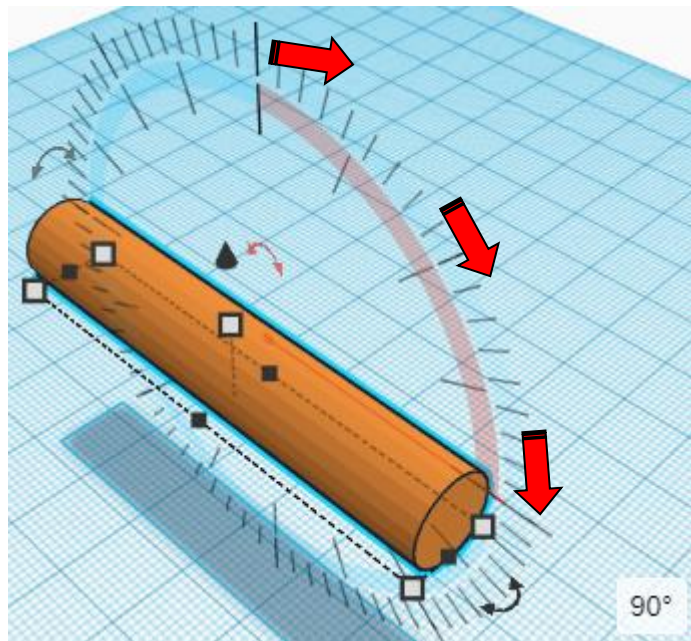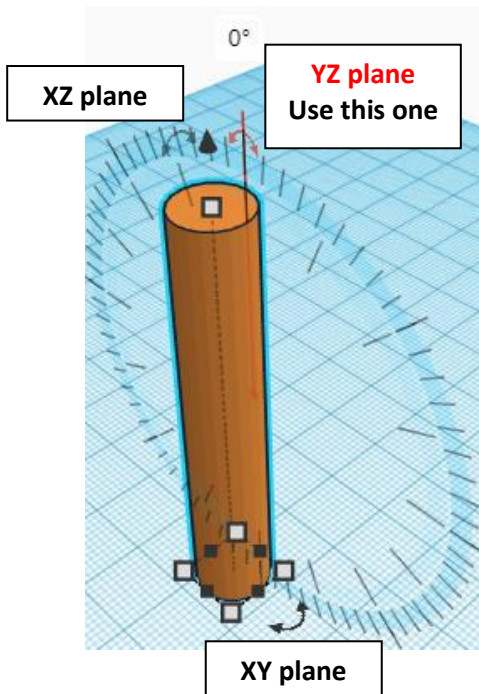

8mm
Up
(hold control)

Group Perch Support and Perch
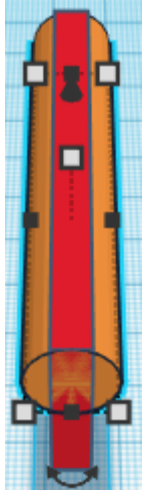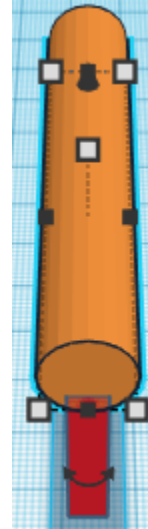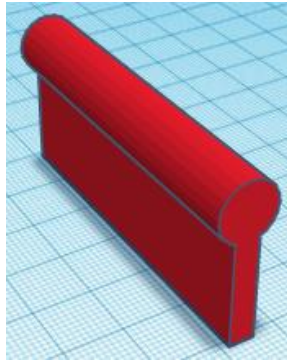From now on this will be called the **Perch**

Align Bird House and Perch

centered in X direction,
front in Y direction, and
bottom in Z direction.
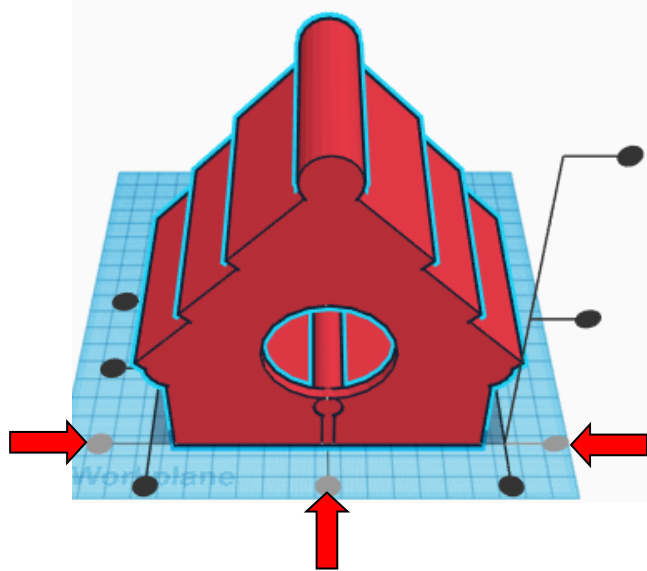
Move Bird House   (Must be in home view for this to work!)
move Back in positive Y direction 60mm

Hint: Select Bird House and push up arrow key 60 times.
       Or
       Select Bird House and hold shift and push up arrow key 6 times.

Before   After

60mm
Up
(hold control)

Group Bird House and Perch
From now on this will be called the **Bird House**
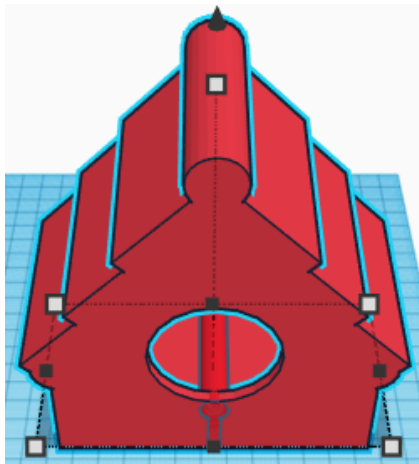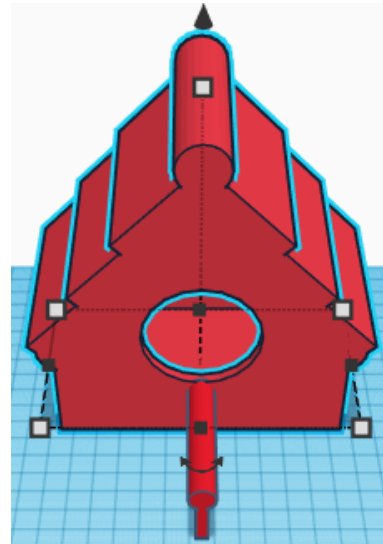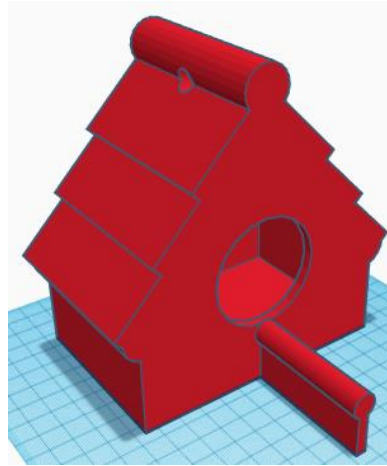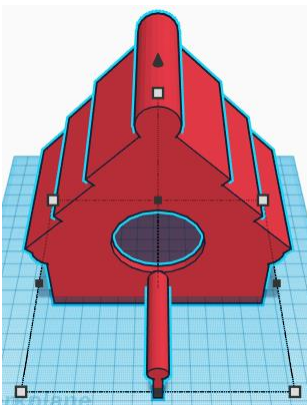

Set on Workplane:

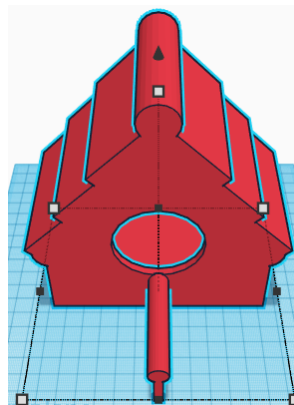Select the Bird House and type "d" to set the body on the work plane.

Before   After

Congratulations, your Bird House is done!

**Advanced students can try adding extra
decorations to their bird house,
See below for example.**

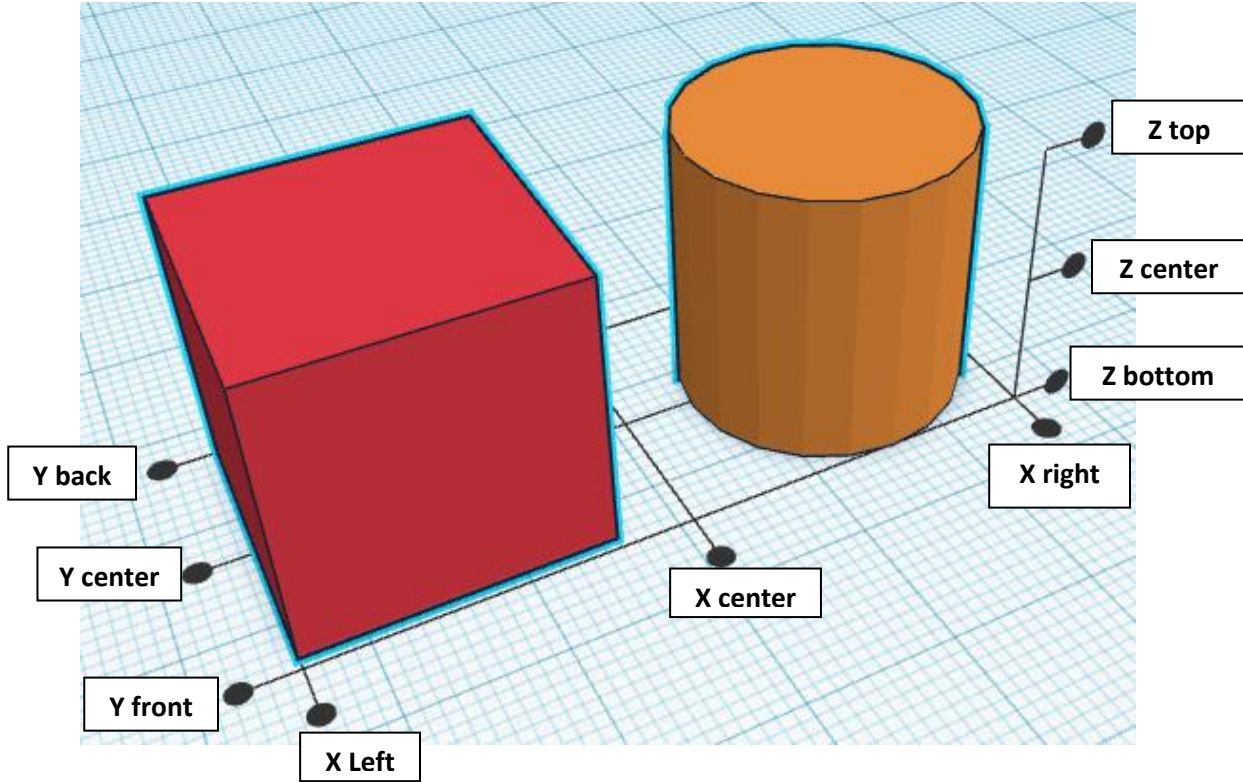# Reference to Aligning, Flip direction, Move direction, and Rotate direction.

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

Home view

Aligning:

- Z top
- Z center
- Z bottom
- Y back
- X right
- Y center
- X center
- Y front
- X Left

Flip or Mirror and Move:

- positive Z
- Z direction
- positive Y
- negative Z
- Y direction
- positive X
- negative Y
- negative X
- X direction

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Rotate:

Counter-Clockwise

Clockwise

XY Plane

0°

0°

Counter-Clockwise

YZ Plane

Clockwise

0°

XZ Plane

Clockwise

Counter-Clockwise

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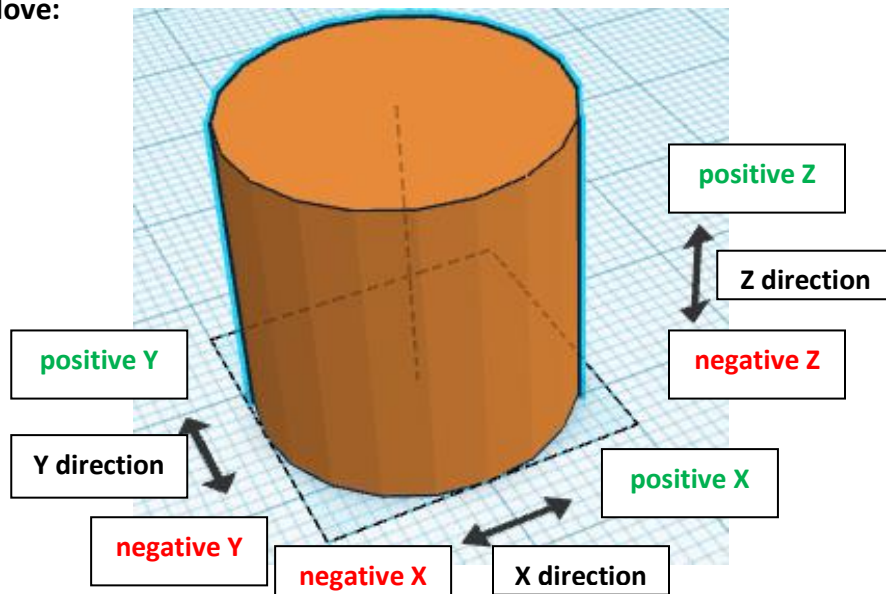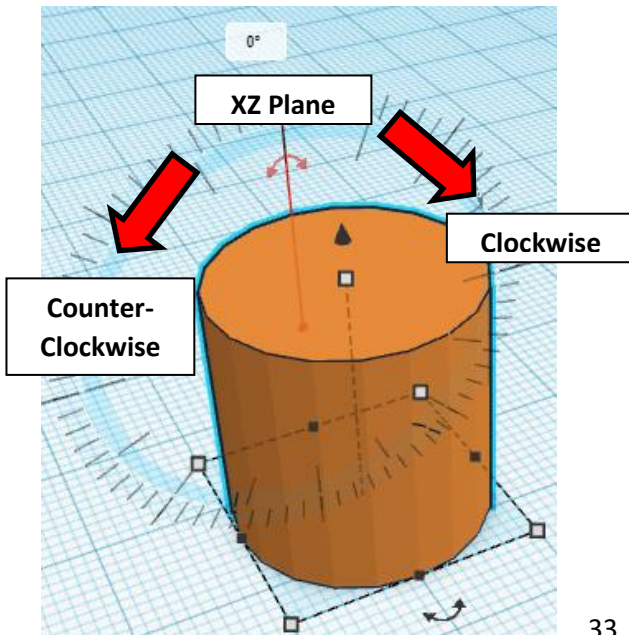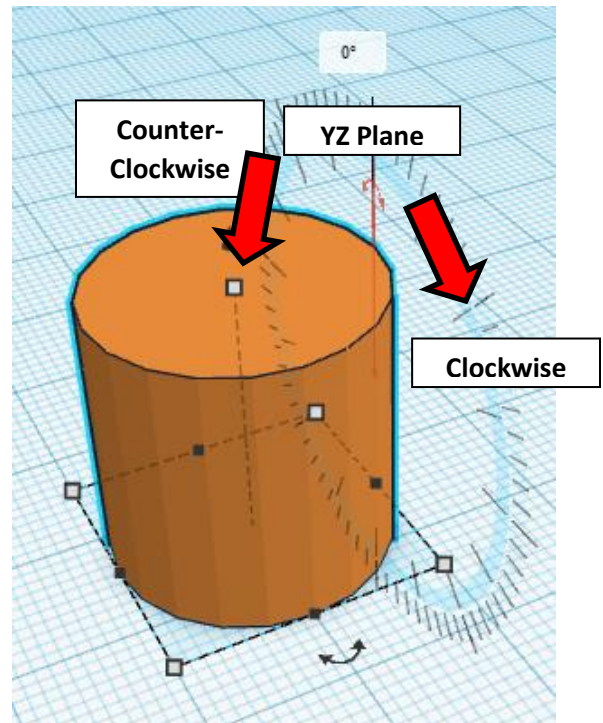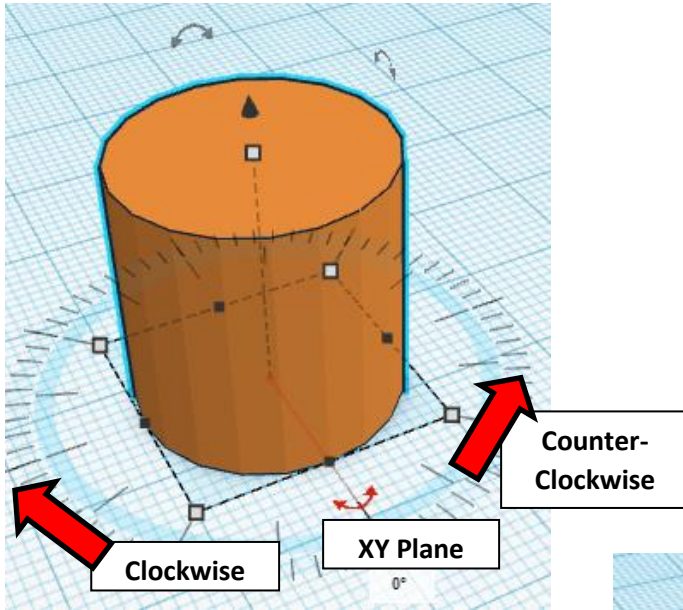
TinkerCAD
Tool Guide

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 objects(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.
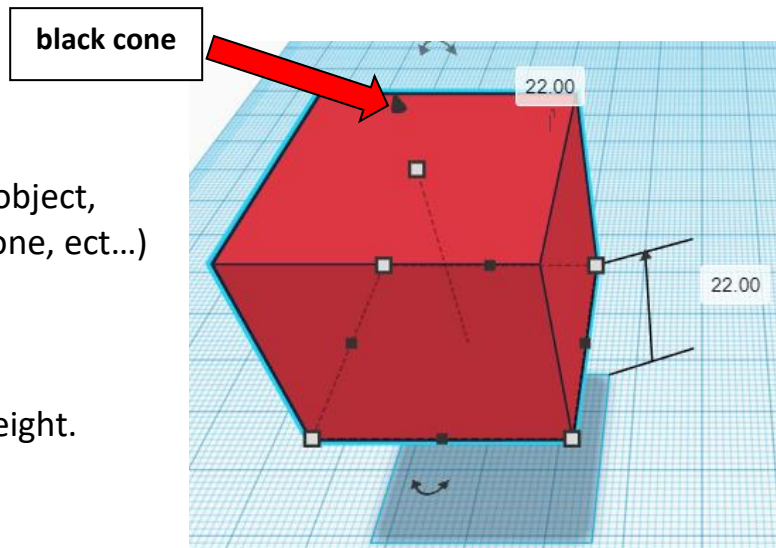
Move mouse to desired location.
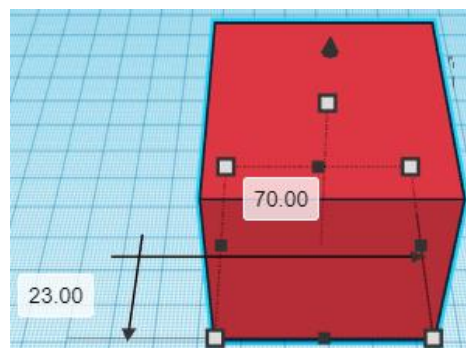
Moving Object(s) continued:

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 <u>black cone</u> at top of object.
Move mouse up or down to desired height.

black cone

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 <u>1mm</u> 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 <u>10mm</u> increments.

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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 <u>1mm</u> increments.

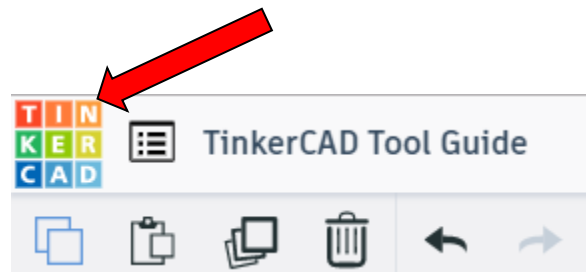**In Z direction (fast)
(up/down)**

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 <u>10mm</u> increments.
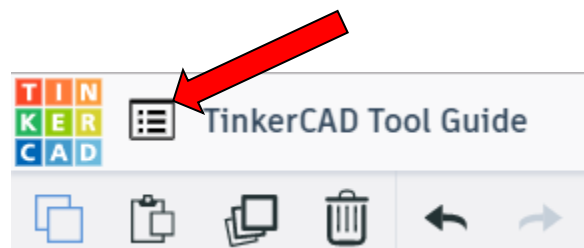

Using on screen icons:

TinkerCAD main screen:

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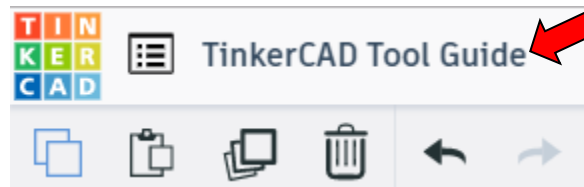like an icon button, but it is)

My designs:

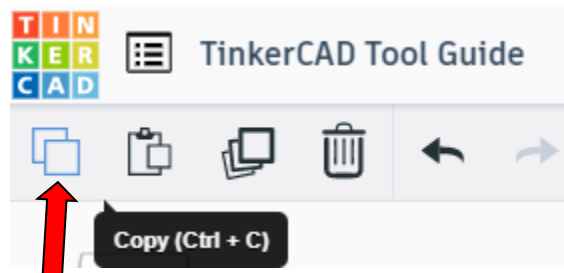Pulls up menu of your designs.

Design name:

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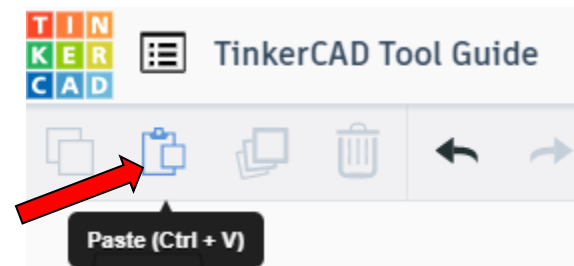Click here to change your design name.

Copy:

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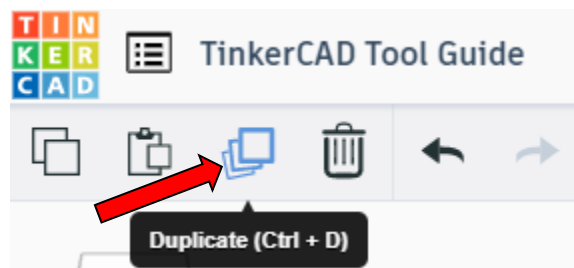Paste to copy or go into new design
and paste to copy.

Paste:

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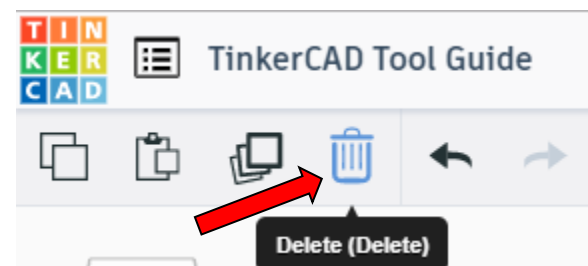click paste or use ctrl + v to paste.

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
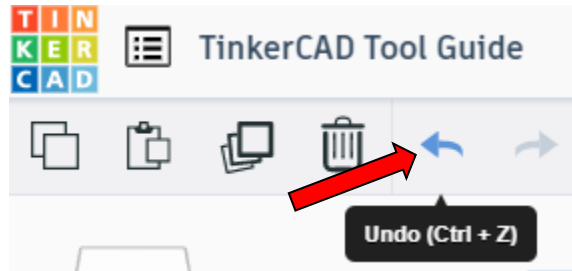see then duplicate underneath.

Delete:

Select shape.
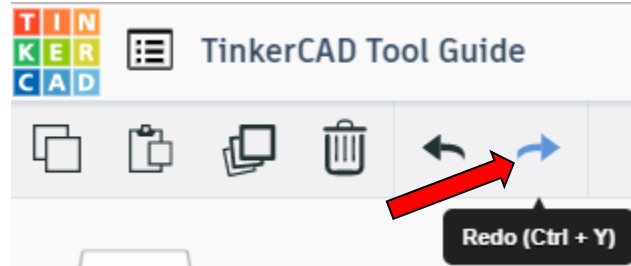Click delete or delete key.

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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,
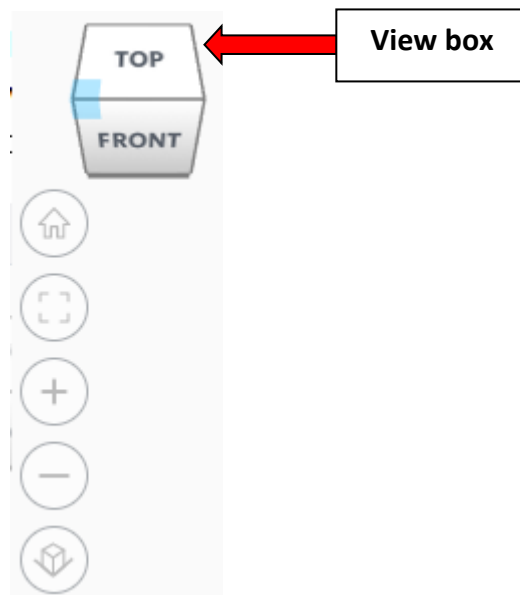can only be used after using the
undo command.

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.
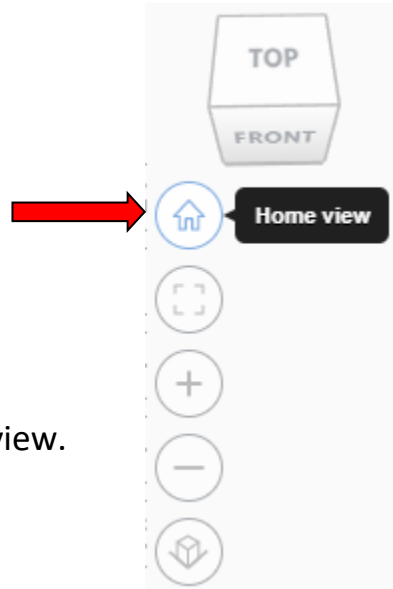Where you click determines
the view shown.

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.
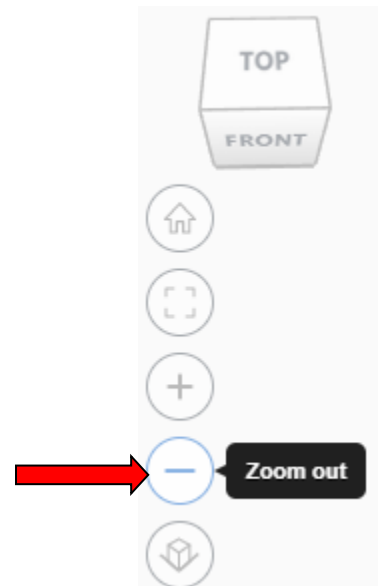This will zoom in on the object(s).

Zoom in:

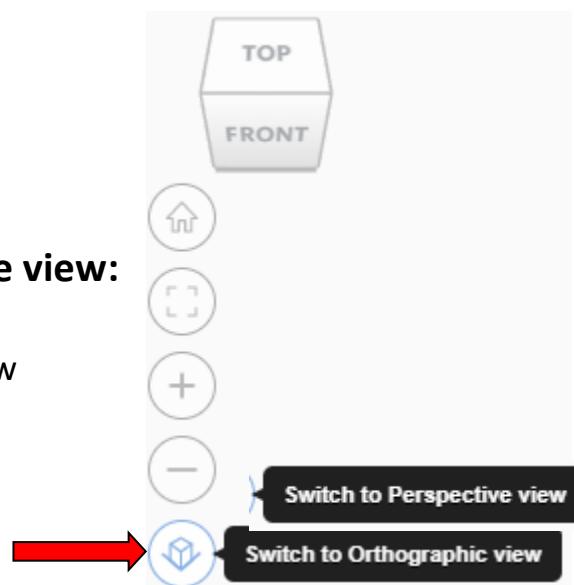Click the Zoom in icon or click the "+" key to zoom in.

Zoom out:

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

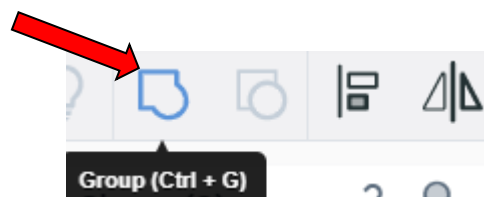## Switching to orthographic and perspective view:

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
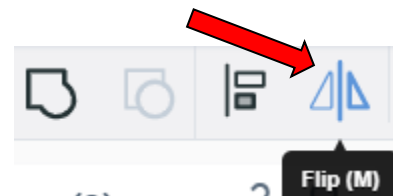To line up objects along their edges then use align.

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