TINKERCAD

Snowflake

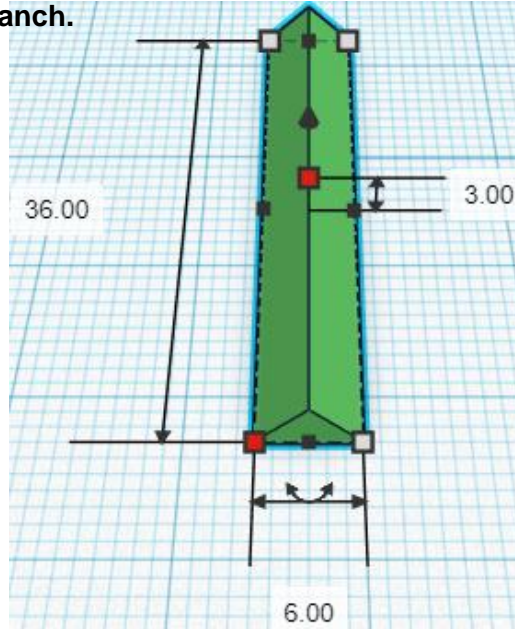# Ornament

Contents:

# Snowflake Main Branch:

Main Branch:
Bring in a Roof, located in Basic Shapes on the left 4 shapes down.
From now on this will be called the **Main Branch.**

Change the dimensions to
6mm X direction,
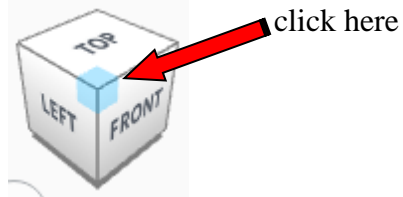36mm Y direction, and
3mm Z direction.

Bring in a Box (cutout), located in Basic Shapes on the left 1 shape down.
From now on this will be called the **Bevel Cutout**

Change the dimensions to
20mm X direction,
20mm Y direction, and
20mm Z direction.
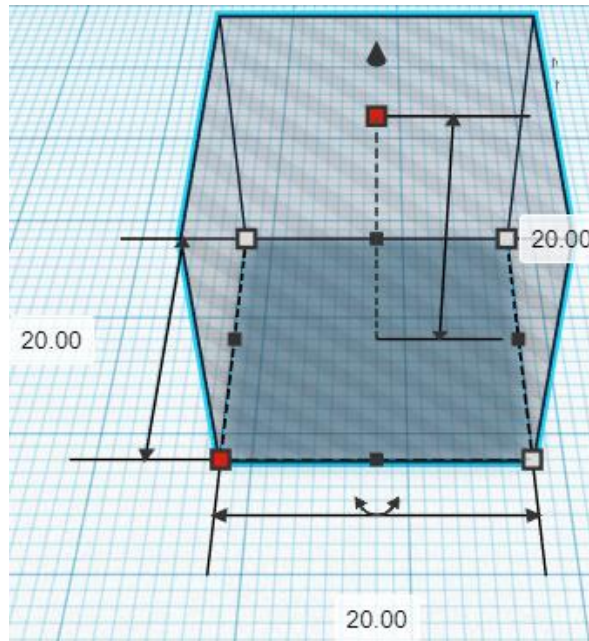
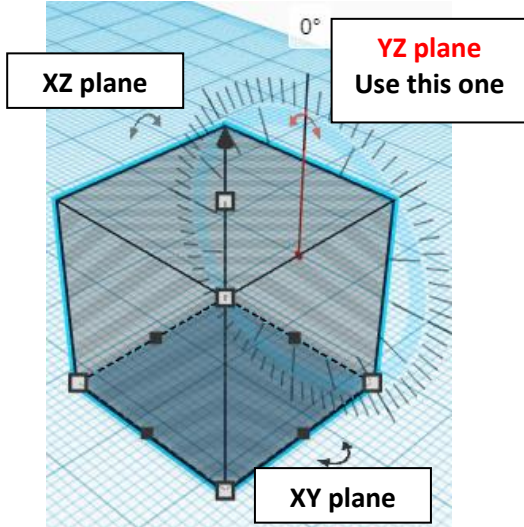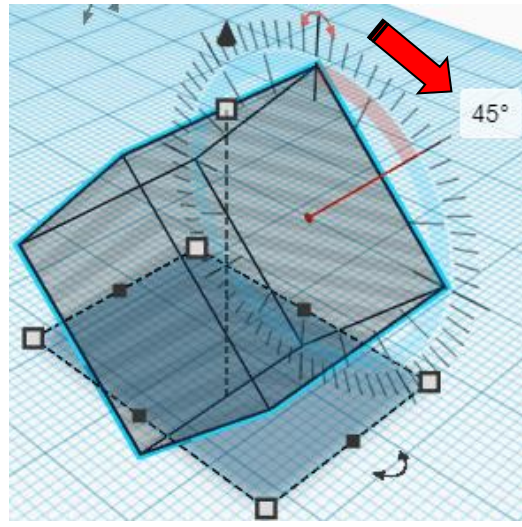Go to TOP LEFT FRONT view for rotations click here

Rotate the Bevel Cutout clockwise 45 degrees in YZ plane.
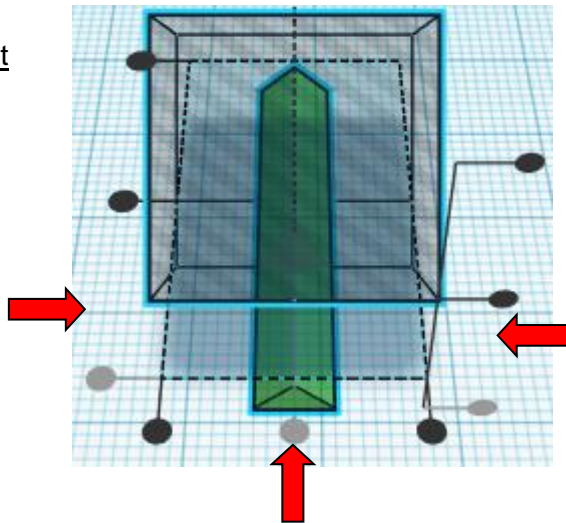
Before
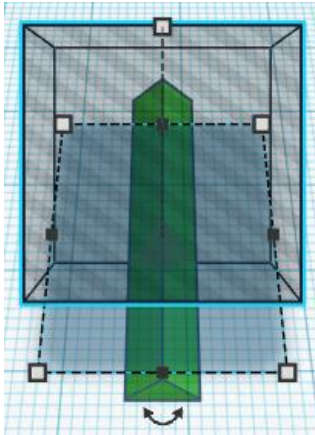

After

Align Main Branch and Bevel Cutout

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

Move Bevel Cutout   (Must be in home view for this to work!)
move forward in negative Y direction 14mm

Hint: Select Bevel Cutout and push down arrow key 14 times.
         Or
         Select Bevel Cutout and hold shift and push down arrow key 1 times,
         Then release shift and push down arrow key 4 times.

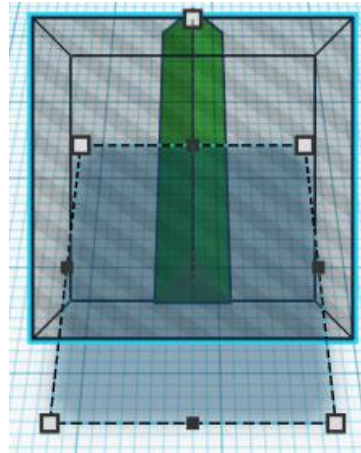Before   After

14mm
forward

Group Main Branch and Bevel Cutout
From now on this will be called the **Main Branch**

Set on Workplane:

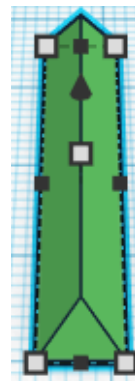Select the Main Branch and type "d" to set the body on the work plane.

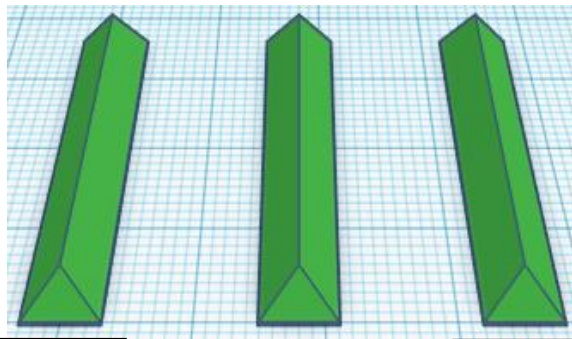Before   After

Duplicate <u>Main Branch</u> 2 time

Move the duplicates to the side
The objects will be named:
Main Branch,
Star Branch,
and **Short Branch**

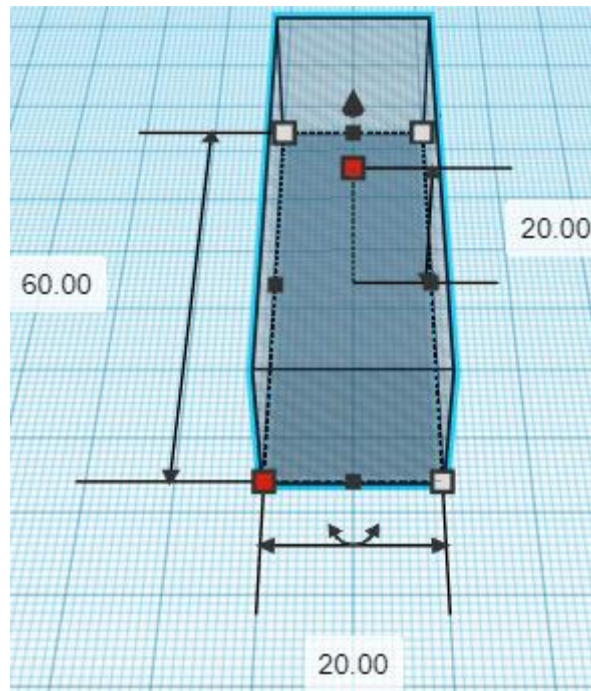| Main Branch | Star Branch | Short Branch |

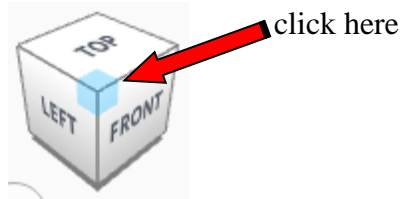# Snowflake Star Branch:

Star Branch:
Bring in a Box (cutout), located in Basic Shapes on the left 1 shape down.
From now on this will be called the **Angle Cutout**

Change the dimensions to
20mm X direction,
60mm Y direction, and
20mm Z direction.

60.00

20.00

20.00

Go to TOP LEFT FRONT view for rotations

click here

Rotate the Angle Cutout clockwise 30 degrees in XY plane.

Before

After

XZ plane

YZ plane

XY plane
Use this one

0°

30°
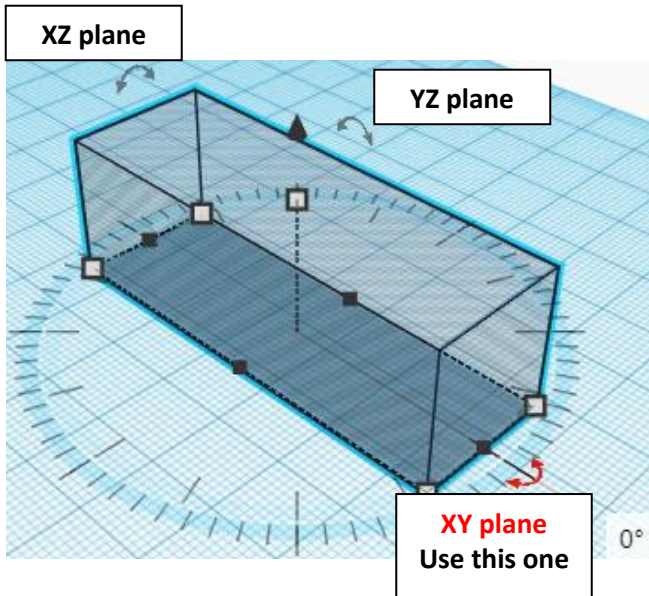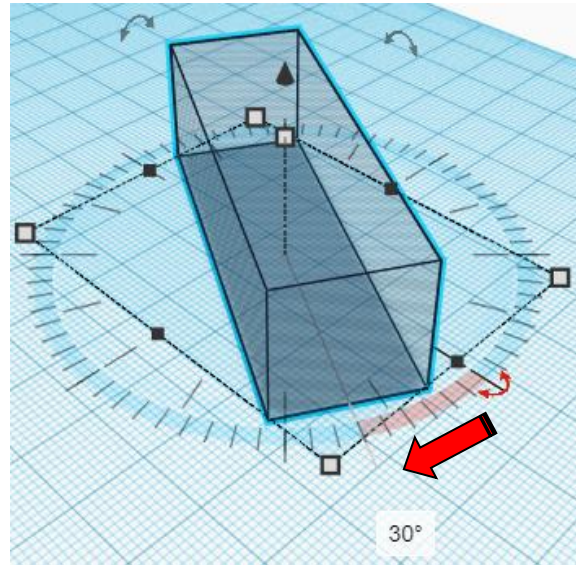
Align Star Branch and Angle Cutout

centered in X direction,
centered of Y direction, and
bottom of Z direction.
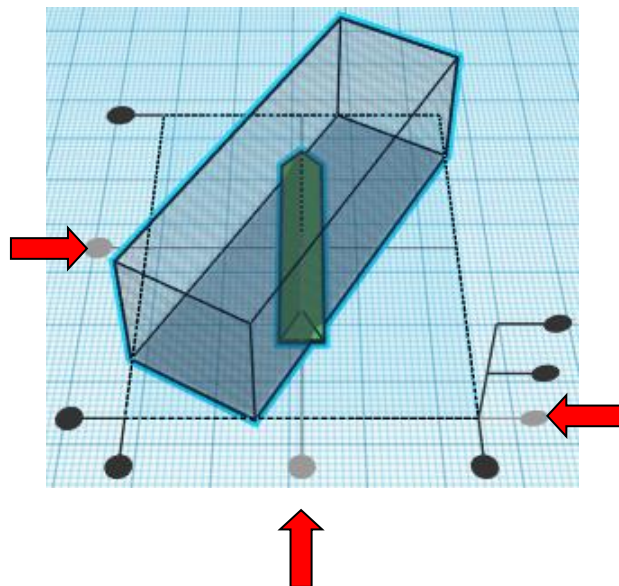
Move Angle Cutout   (Must be in home view for this to work!)
move right in positive X direction 10mm

Hint: Select Angle Cutout and push right arrow key 10 times.
        Or
        Select Angle Cutout and hold shift and push right arrow key 1 times,
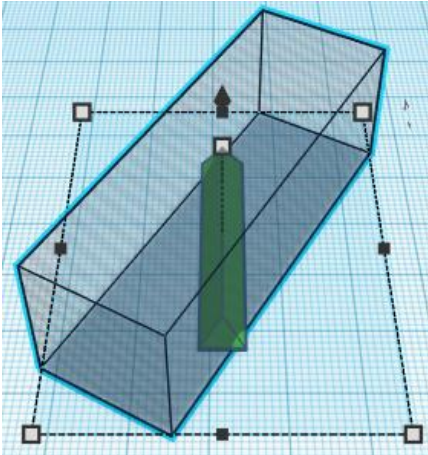
Before   After

10mm
right

Group Star Branch and Angle Cutout
From now on this will be called the **Star Branch**

Go to TOP LEFT FRONT view for rotations click here
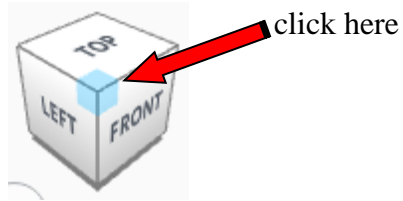
Rotate the Star Branch counter-clockwise 60 degrees in XY plane.
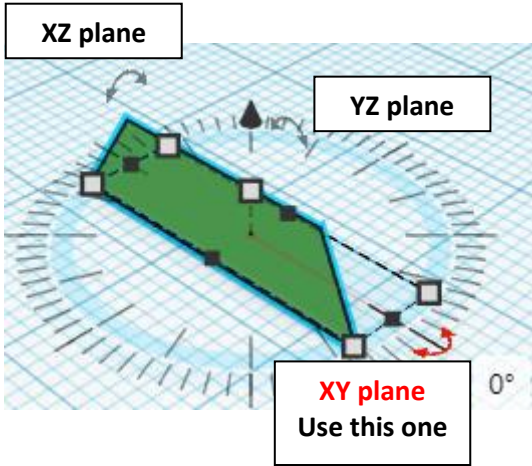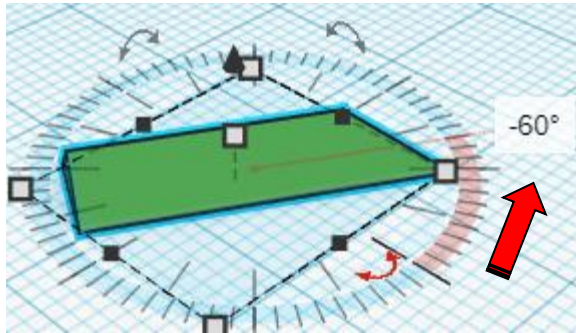
Before

After
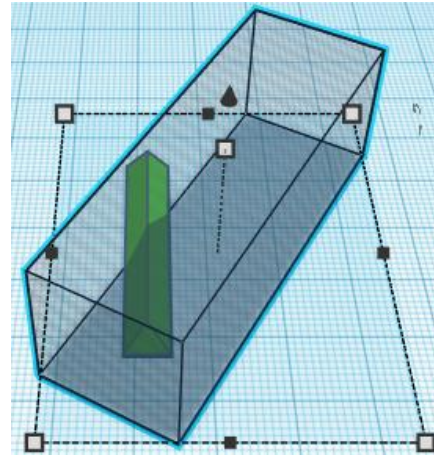

Duplicate Star Branch 1 time

Flip Star Branch in X direction.

Before
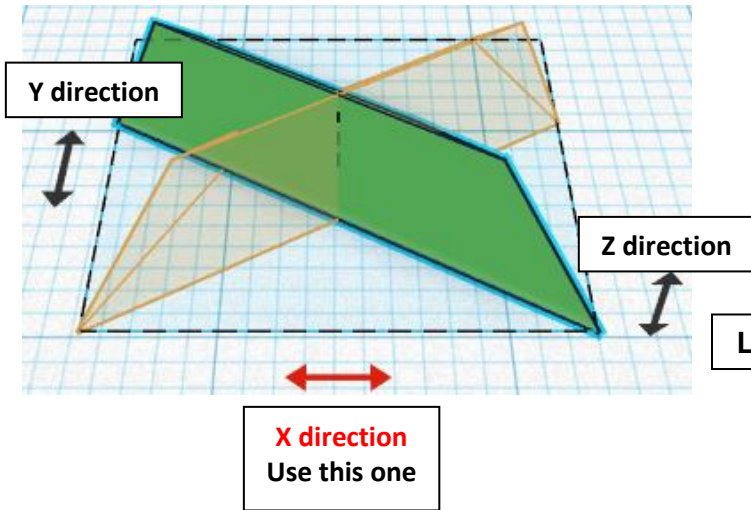
After
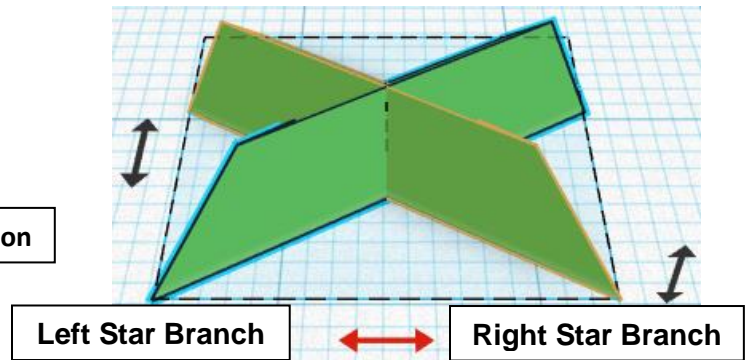
From now on this new flipped part will be called the **Left Star Branch**
while
the original part will be called the **Right Star Branch**

Move Left Star Branch   (Must be in home view for this to work!)
move left in negative X direction 15mm

Hint: Select Left Star Branch and push left arrow key 15 times.
           Or
           Select Left Star Branch and hold shift and push left arrow key 1 times,
           Then release shift and push left arrow key 5 times.

Before   After
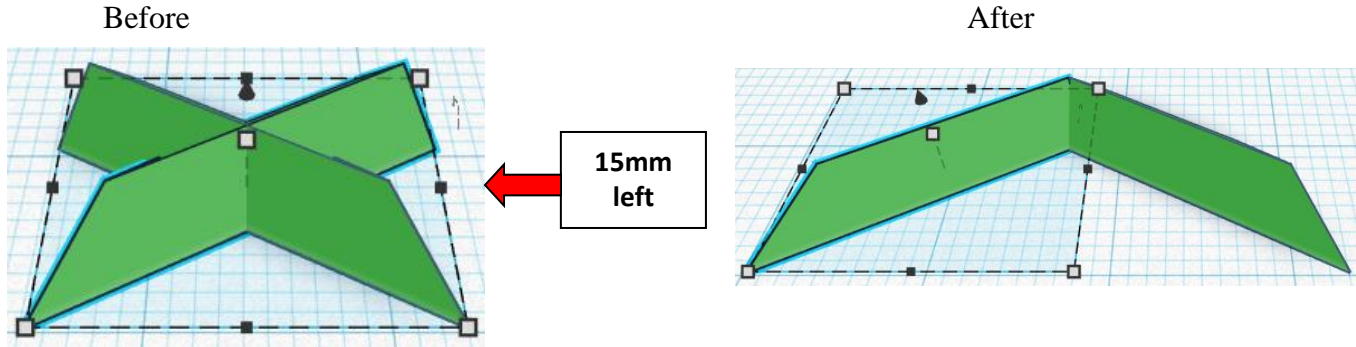
Group Left Star Branch and Right Star Branch
From now on this will be called the **Star Branch**

Align Star Branch and Main Branch

centered in X direction,
centered of Y direction, and
bottom of Z direction.
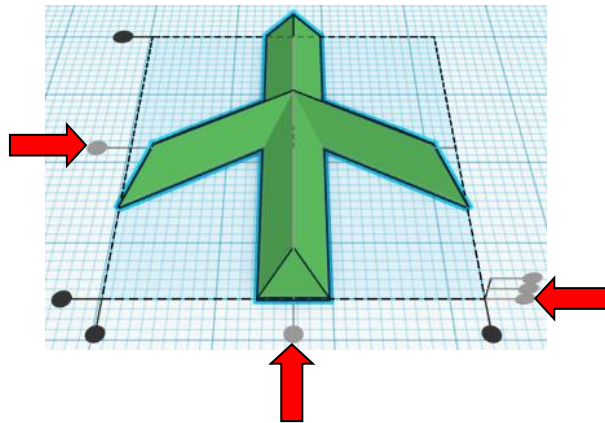
Group Star Branch and Main Branch
From now on this will be called the **Main Branch**
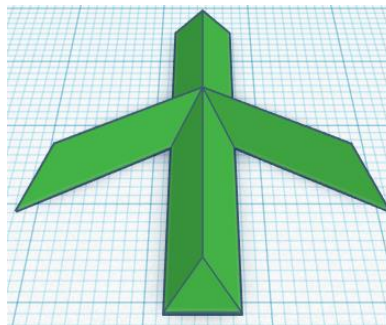
Snowflake Short Branch:

Short Branch:

Change the dimensions to <u>Short Branch</u> to:
6mm X direction,
14mm Y direction, and
3mm Z direction.
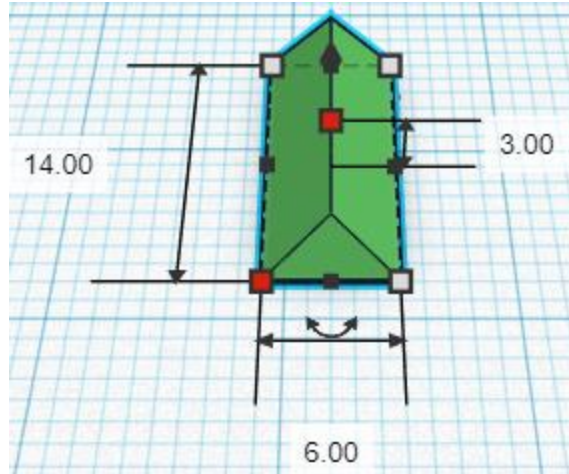
Go to TOP LEFT FRONT view for rotations   click here
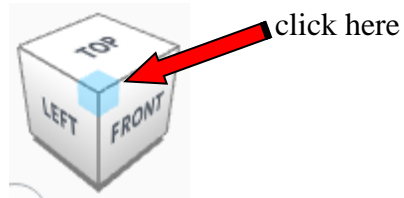
**Rotate** the <u>Short Branch</u> counter-clockwise 60 degrees in XY plane.
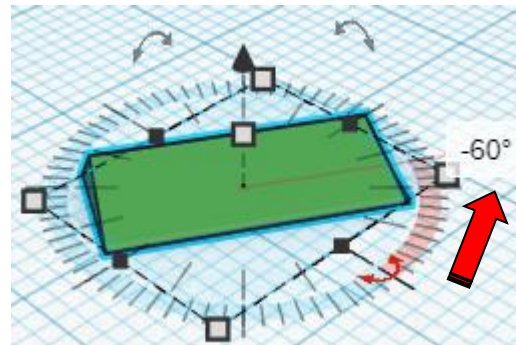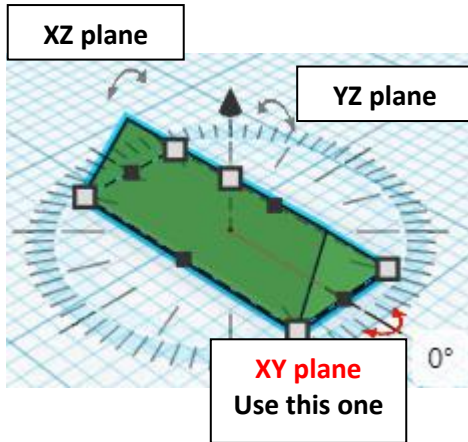
Before   After

Duplicate <u>Short Branch</u> 1 time

Flip Short Branch in X direction.

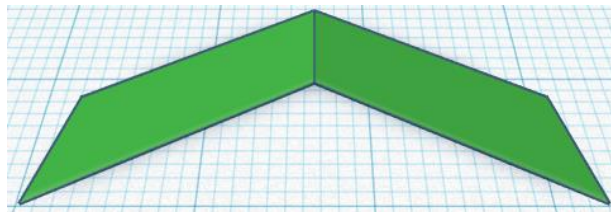Before   After

From now on this new flipped part will be called the **Left Short Branch** while
the original part will be called the **Right Short Branch**

Move Left Short Branch   (Must be in home view for this to work!)
move left in negative X direction 12mm

Hint: Select Left Short Branch and push left arrow key 12 times.
        Or
        Select Left Short Branch and hold shift and push left arrow key 1 times,
   Then release shift and push left arrow key 2 times.

Before   After

12mm left

Group Left Short Branch and Right Short Branch
From now on this will be called the **Short Branch**

Align Short Branch and Main Branch

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

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

Hint: Select Main Branch and push down arrow key 3 times.
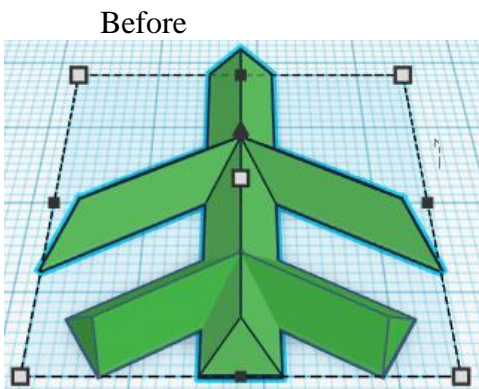
Before

After

3mm
down
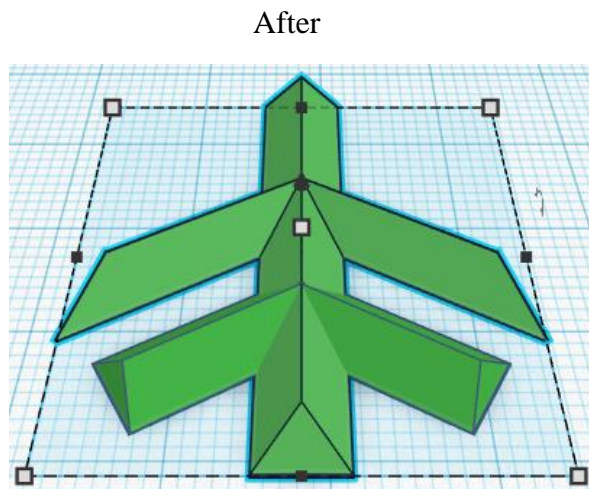
Group <u>Short Branch</u> and <u>Main Branch</u>
From now on this will be called the **Main Branch**
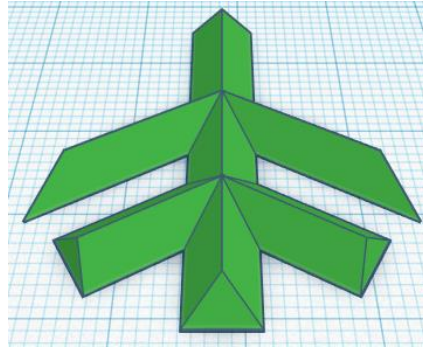
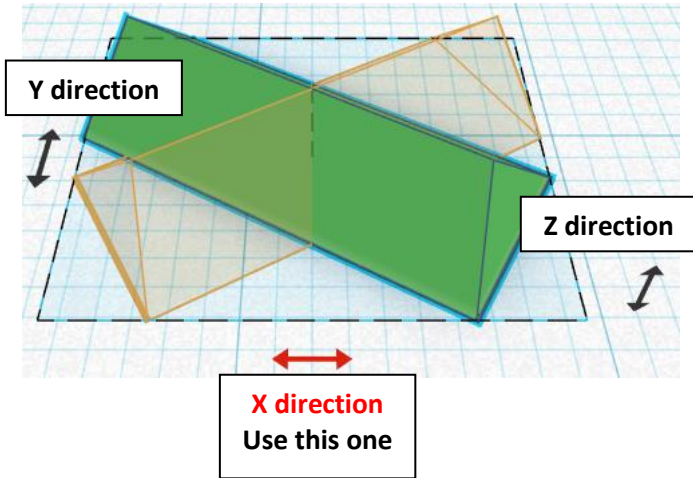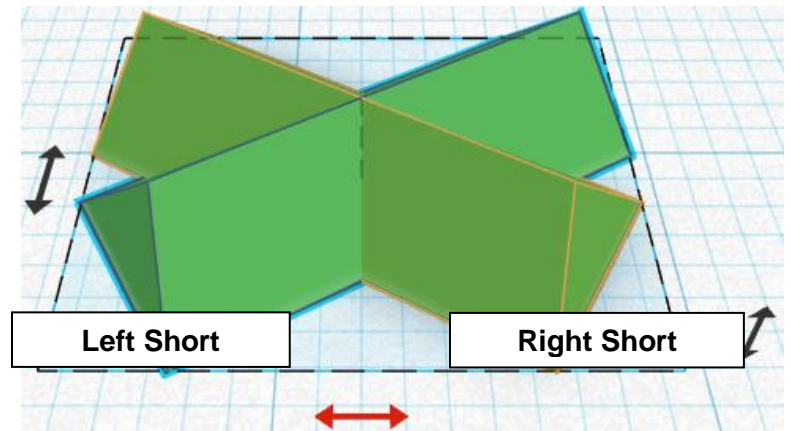**Duplicate** <u>Main Branch</u> 1 time

Flip <u>Main Branch</u> in Y direction.

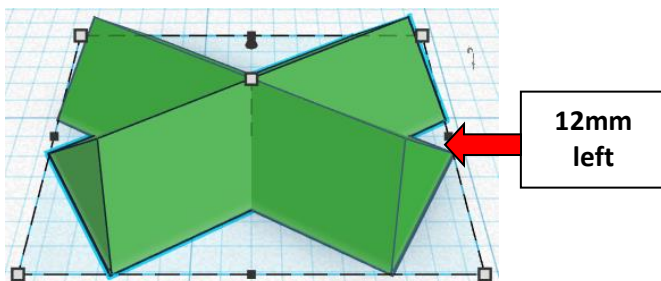Before   After
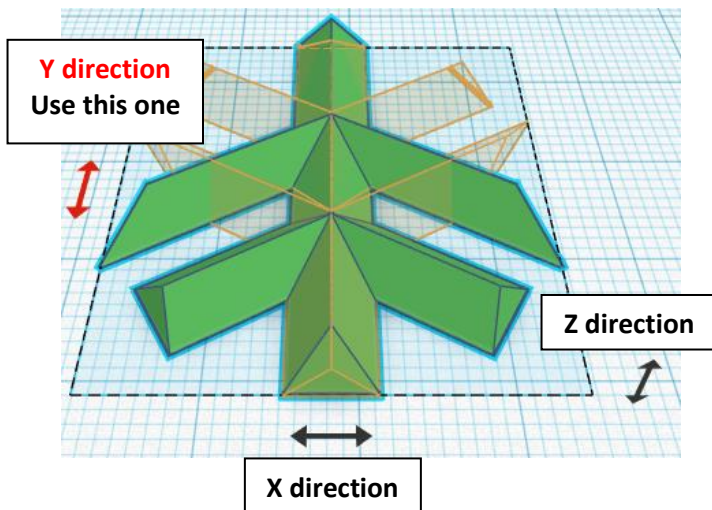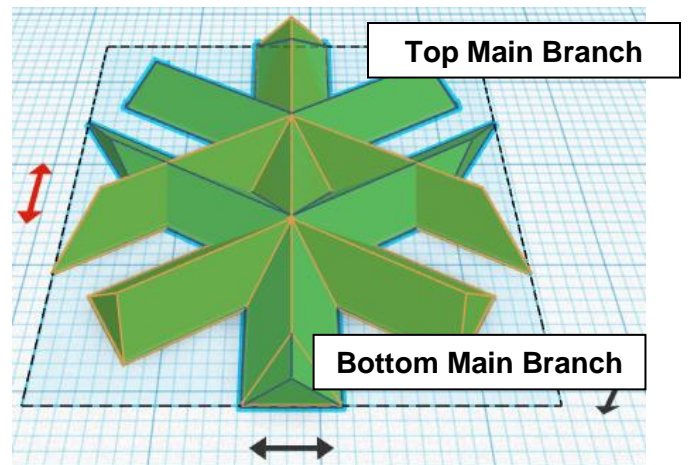
From now on this new flipped part will be called the **Top Main Branch**
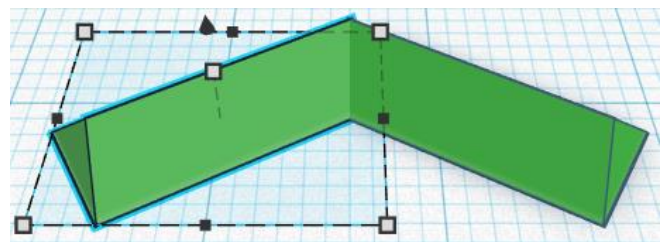while
the original part will be called the **Bottom Main Branch**

Move <u>Bottom Main Branch</u>   (Must be in home view for this to work!)
move down in negative Y direction 41mm

Hint: Select <u>Left Star Branch</u> and push down arrow key 41 times.
     Or
     Select <u>Left Star Branch</u> and hold shift and push down arrow key 4 times,
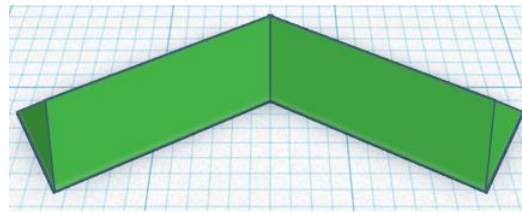   Then release shift and push left arrow key 1 times.
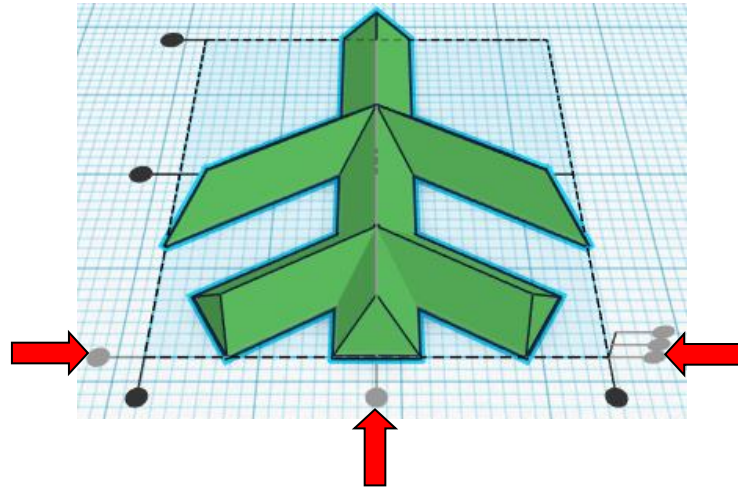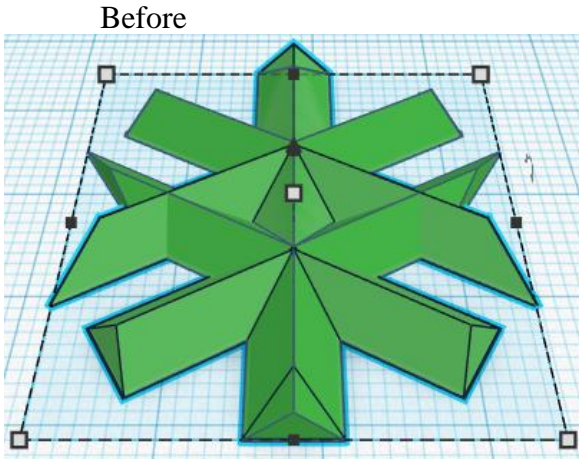
Before   After

41mm
down
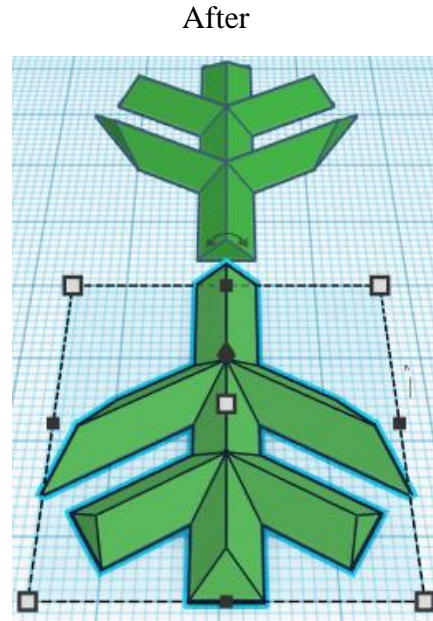
Group <u>Top Main Branch</u> and <u>Bottom Main Branch</u>
From now on this will be called the **Main Branches**
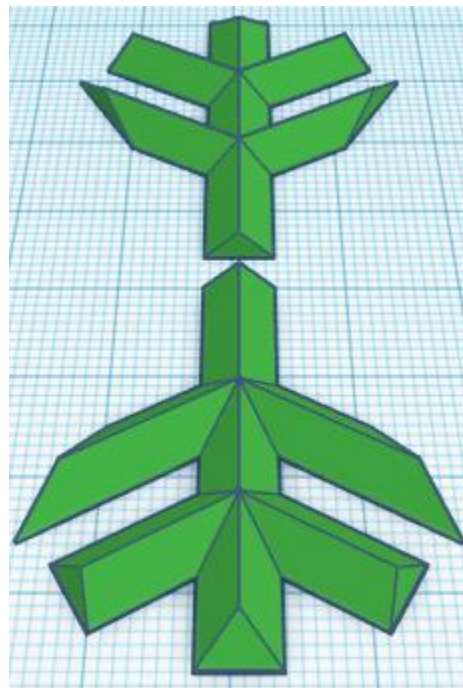
Duplicate Main Branches 1 time

Go to TOP LEFT FRONT view for rotations click here
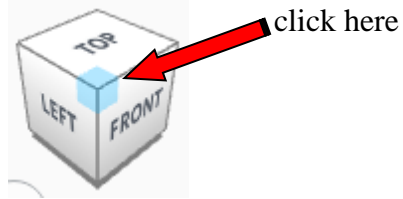
Rotate the Main Branches clockwise 60 degrees in XY plane.
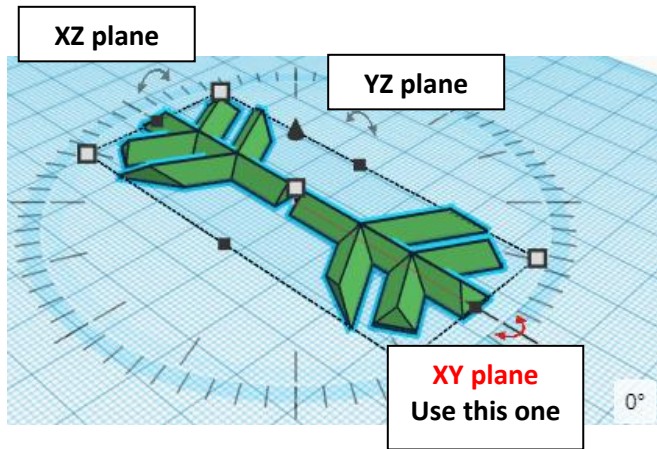
Before   After
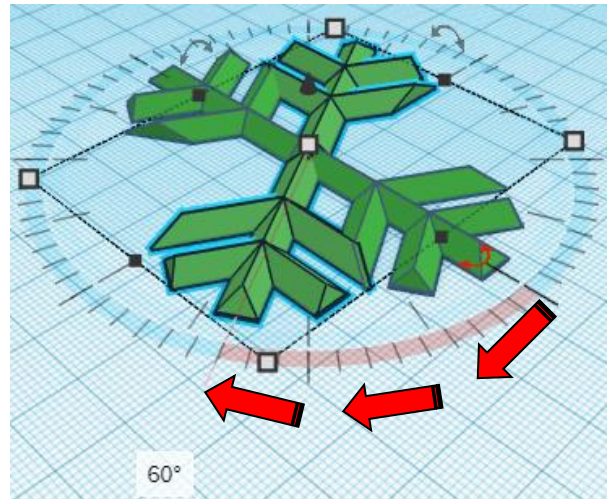
Immediately Duplicate Main Branches 1 time
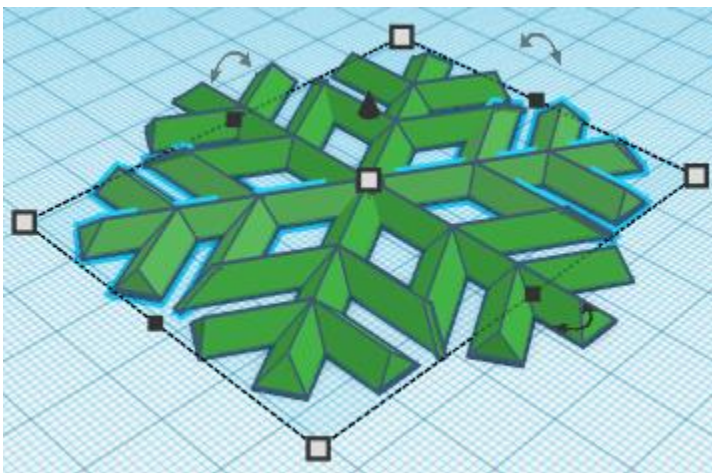
Group Main Branches
From now on this will be called the **Snowflake**
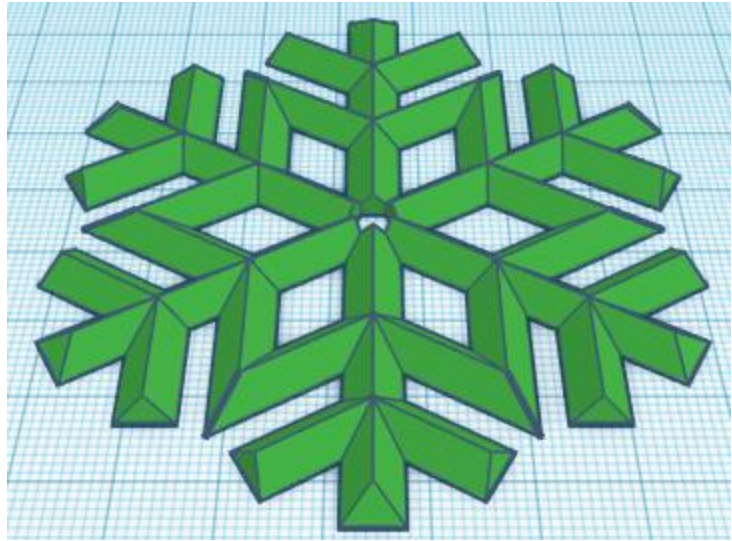
Snowflake Hook:

Hook:
Bring in a Torus, located in Basic Shapes on the right 8 shapes down.
From now on this will be called the **Hook**

Change the dimensions to
10mm X direction,
10mm Y direction, and
3mm Z direction.
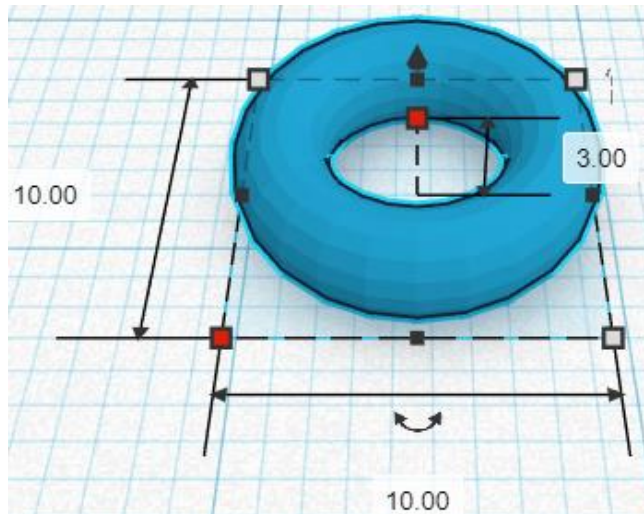
Align Snowflake and Hook

centered in X direction,
front of Y direction, and
bottom of Z direction.
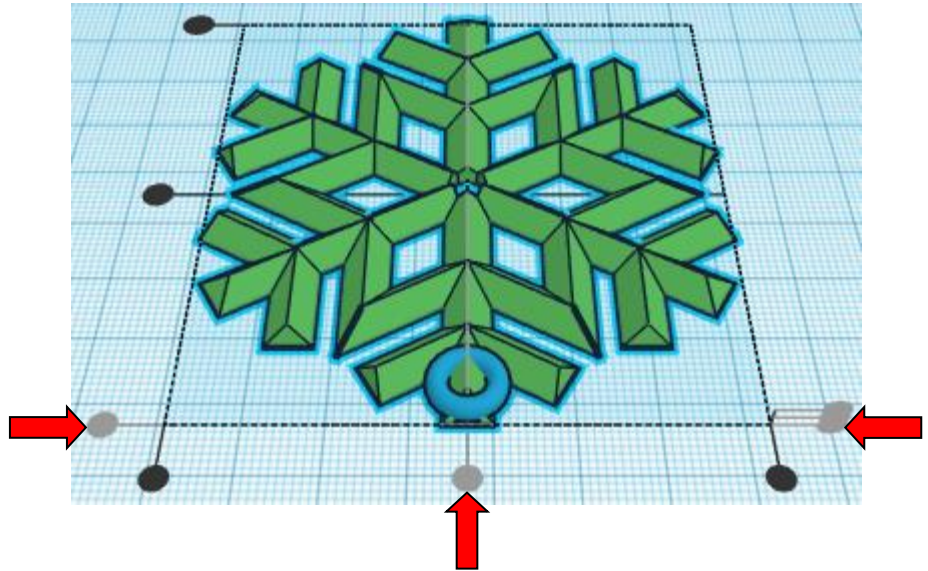
Move Hook   (Must be in home view for this to work!)
move down in negative Y direction 7mm

Hint: Select Hook and push left arrow key 7 times.

Before   After

7mm
down
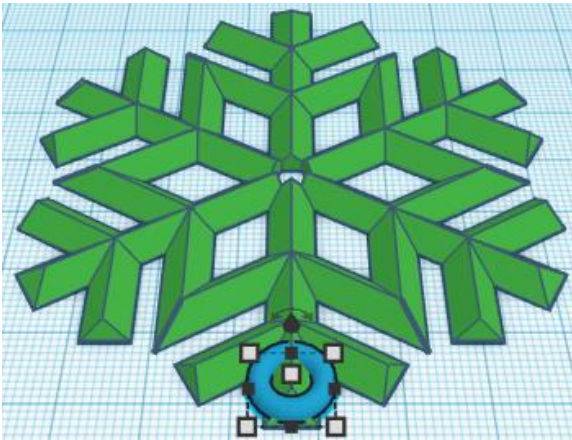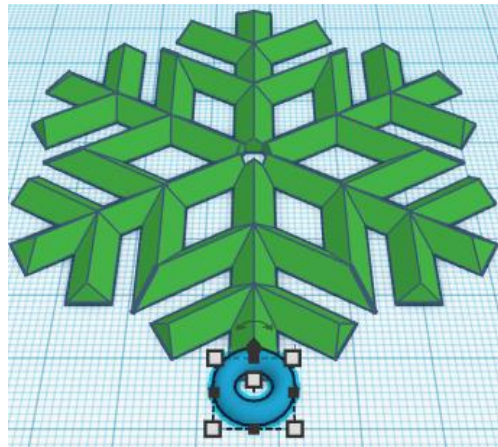
Group <u>Snowflake</u> and <u>Hook</u>
From now on this will be called the **Snowflake**
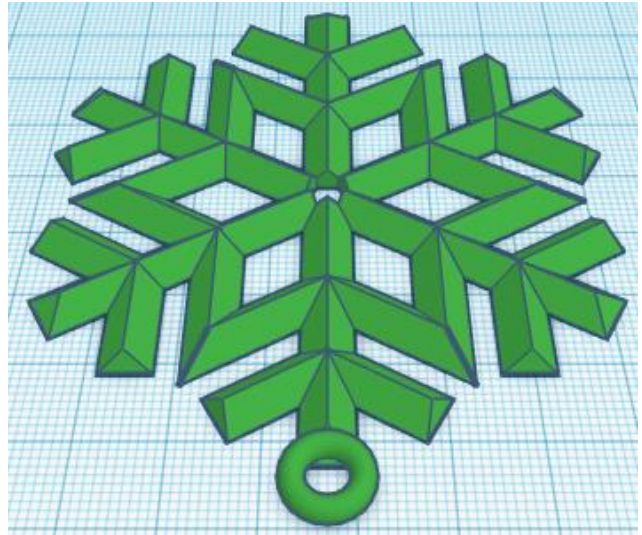
You're are done!
Try many different colors, and stretch to larger or smaller sizes!

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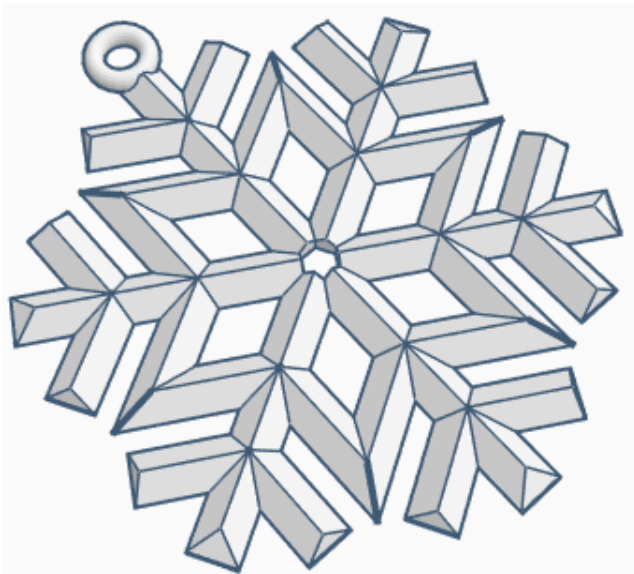
Reference to Aligning, Flip direction, Move direction, and Rotate direction.

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

Rotate:

Counter-Clockwise

Clockwise

XY Plane

0°

0°

Counter-Clockwise

YZ Plane

Clockwise

0°

XZ Plane

Clockwise

Counter-Clockwise

21
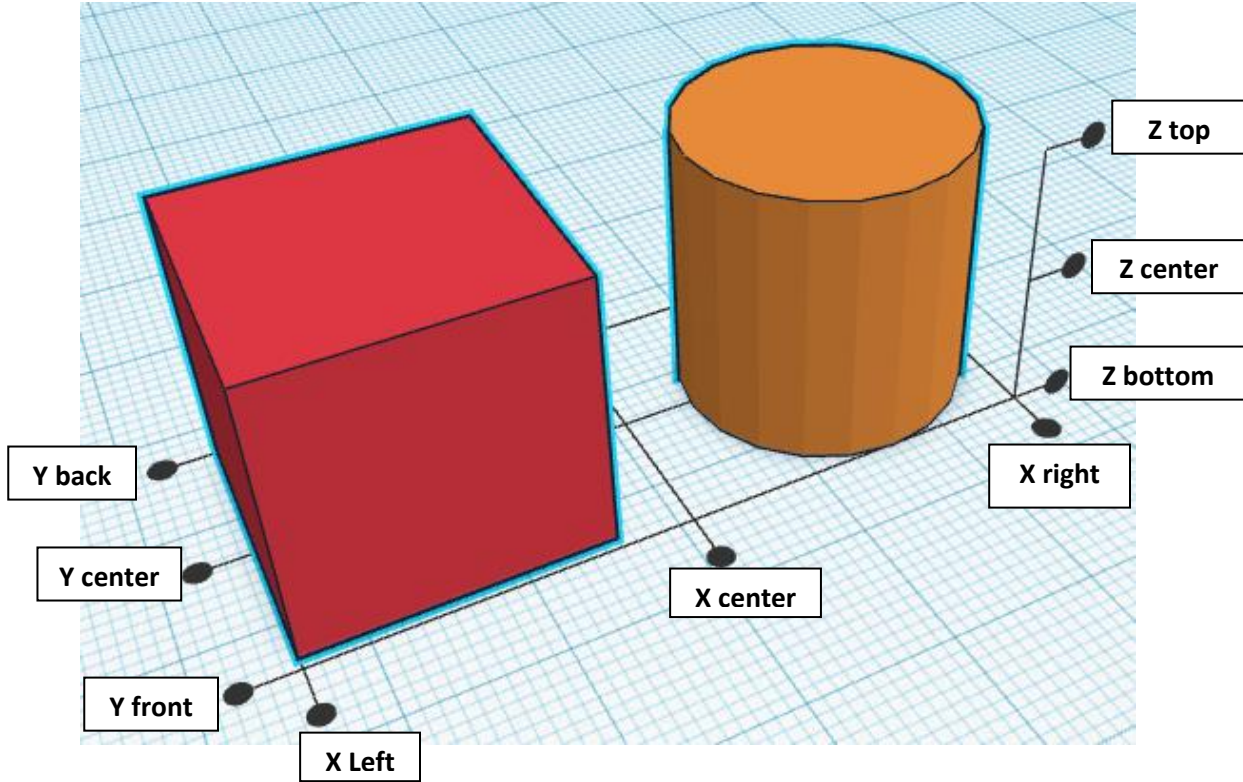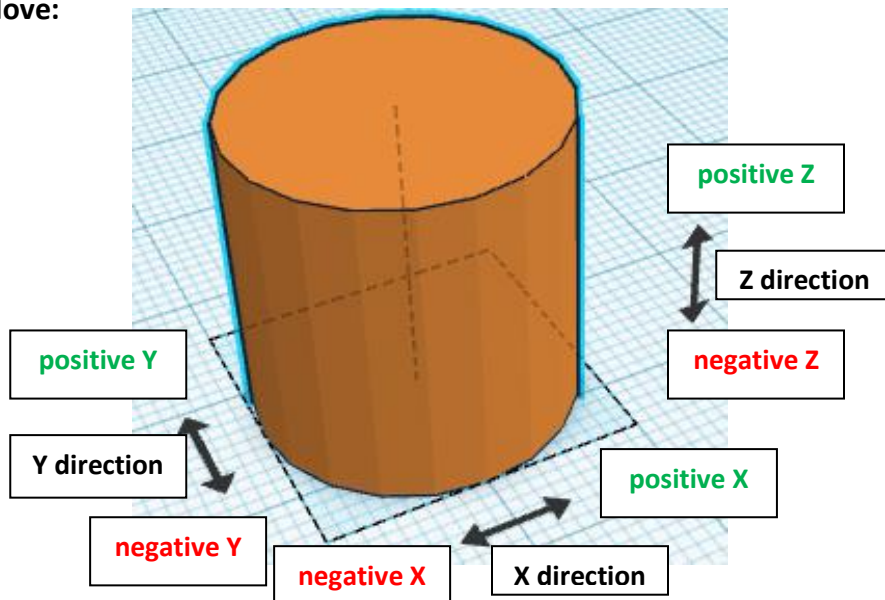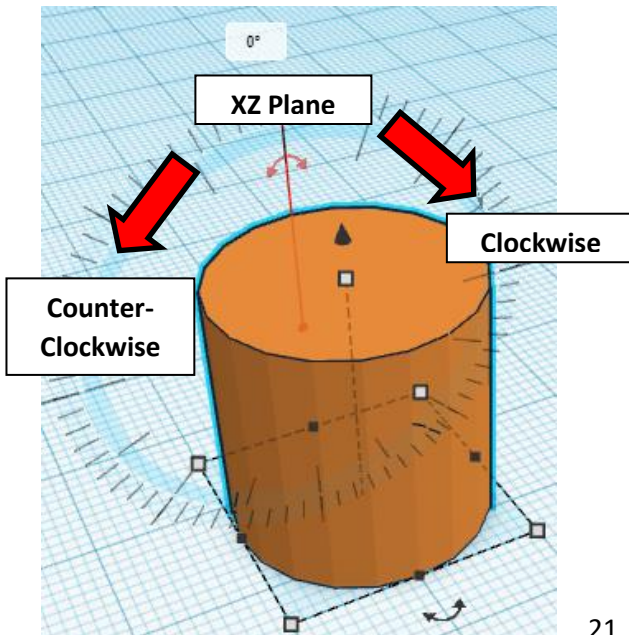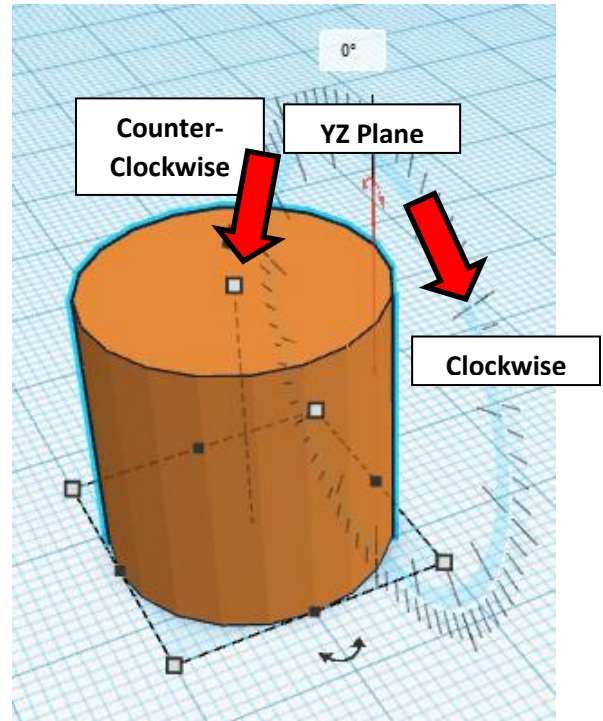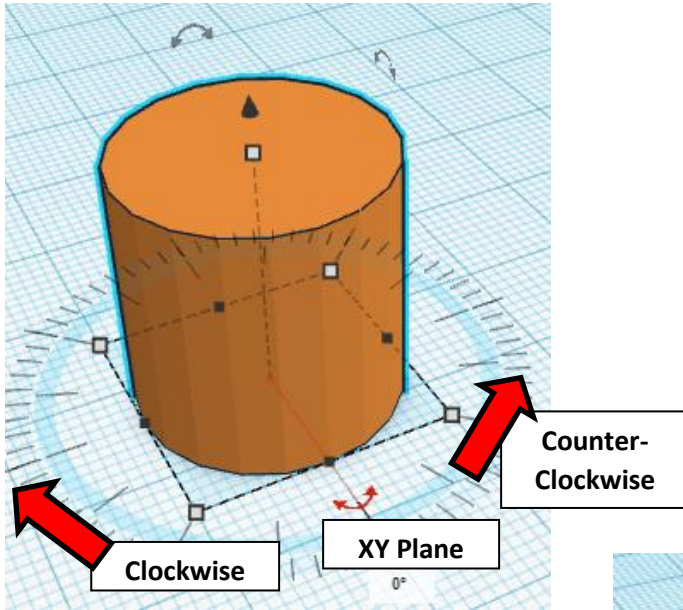
TinkerCAD
Tool Guide

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)

black cone

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.

22.00

22.00
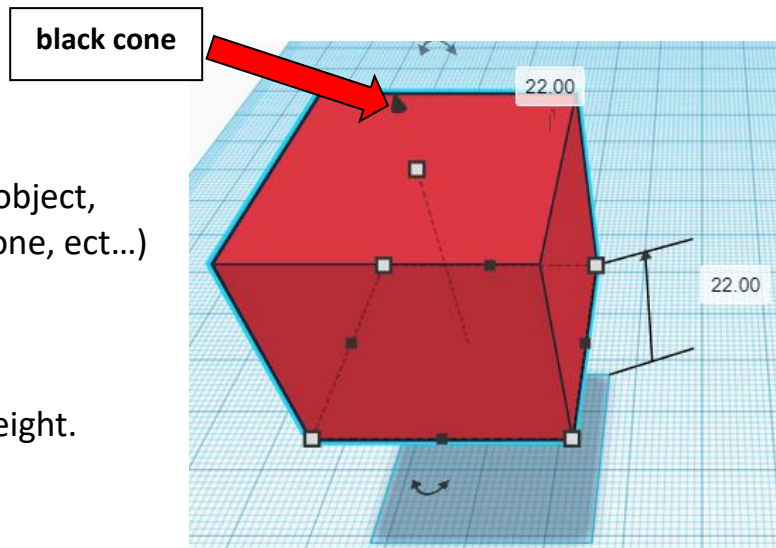
To move object(s) with keyboard:

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.

Shift

+

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)
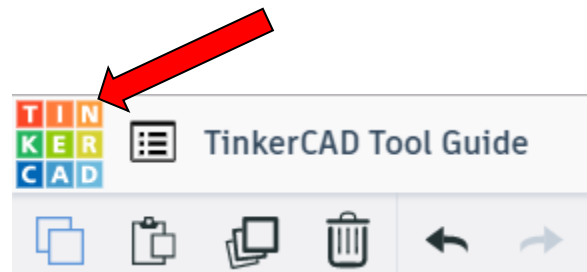
My designs:

Pulls up menu of your designs.
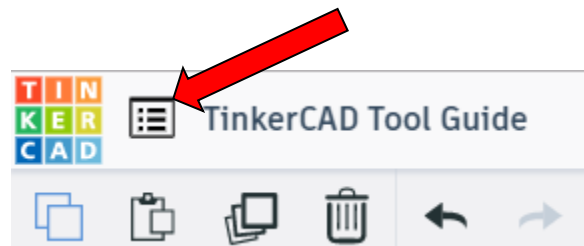
Design name:

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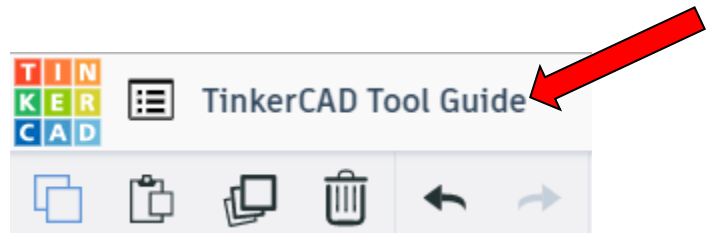
Copy:

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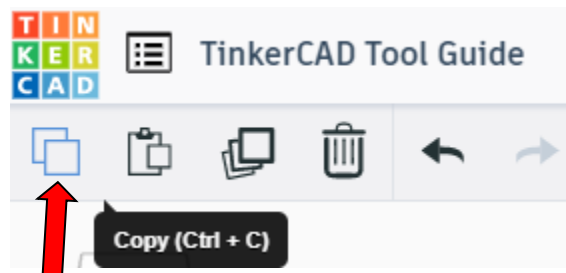
Paste:

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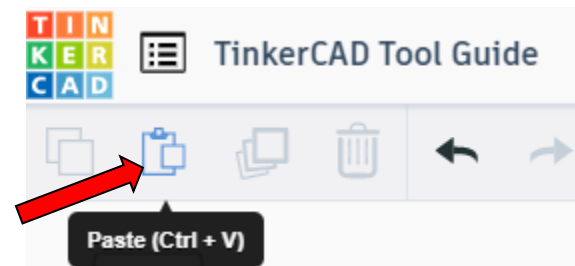
Duplicate:

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.
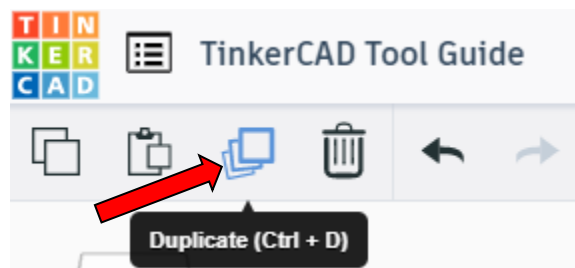
Delete:

Select shape.
Click delete or delete key.

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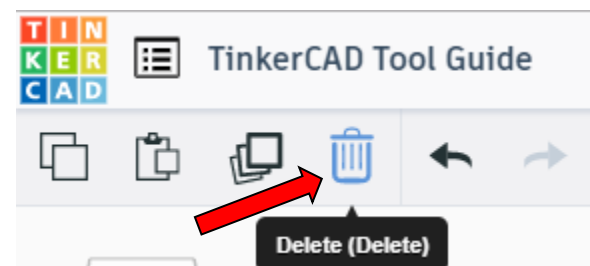
Undo:

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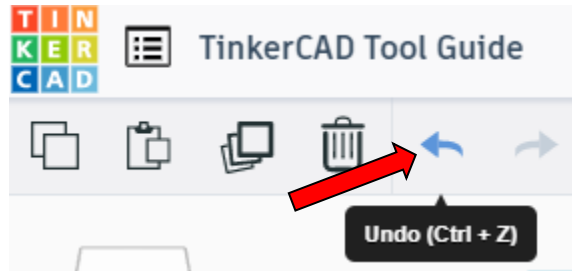
Redo:

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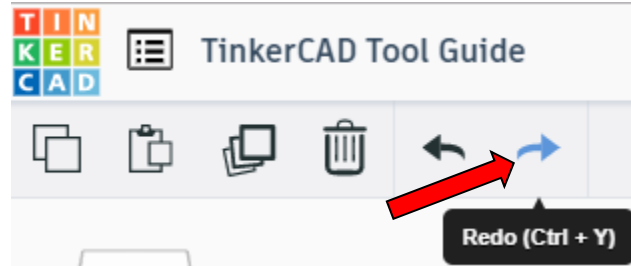
Change View:

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.
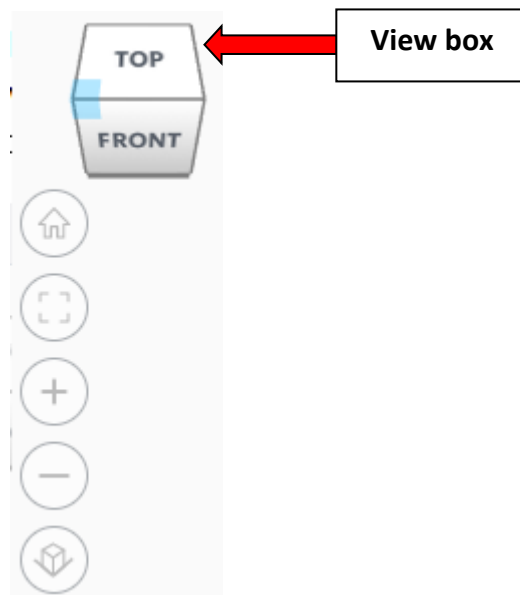
View box

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.
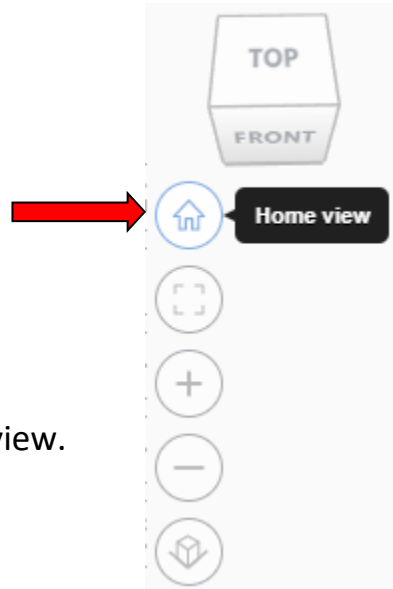
Fit all in view:

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.
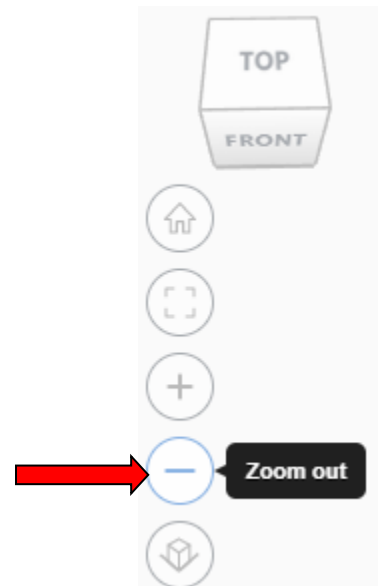
Switching to orthographic and perspective view:

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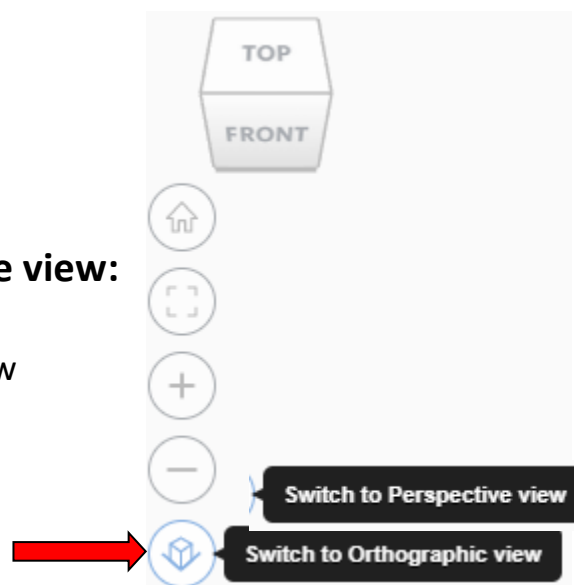
Group:

To combine two or more objects into one object.

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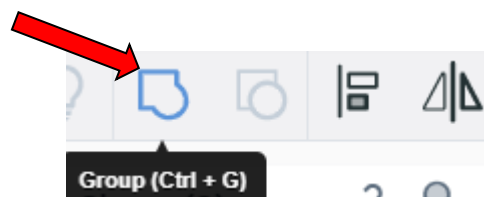
Ungroup:

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)

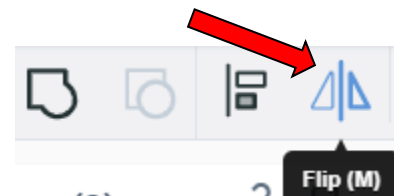|	
Duplicate dragged object(s)	`Alt` + Drag left mouse button
Select multiple object(s)	`Shift` + Left mouse button
45° rotation	`Shift` (Hold while rotating)
Scale in one direction	`Alt` + Hold side handle
Scale in two directions	`Alt` + Hold corner handle
Uniform scale	`Shift` + Hold corner handle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