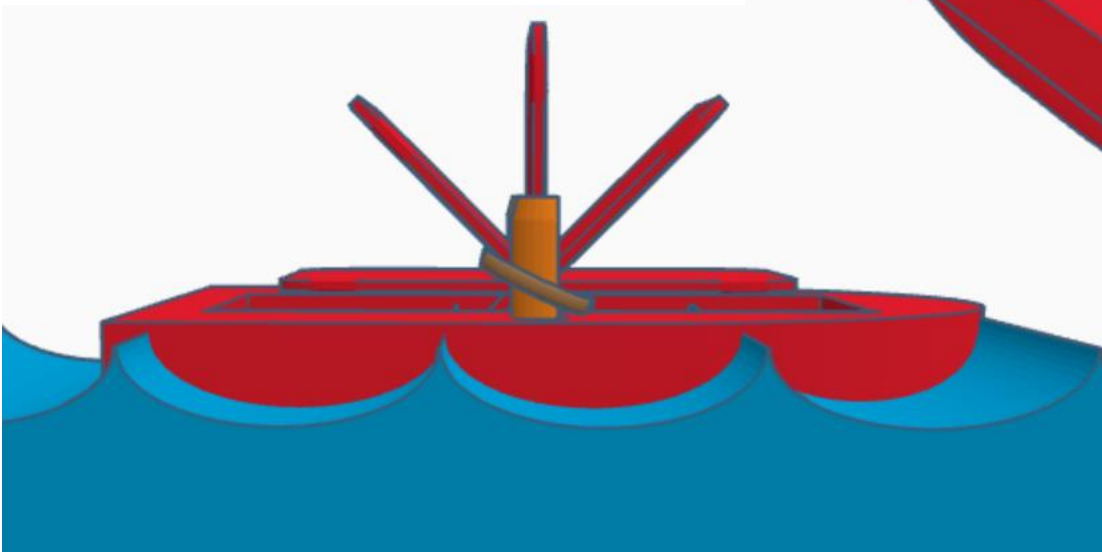
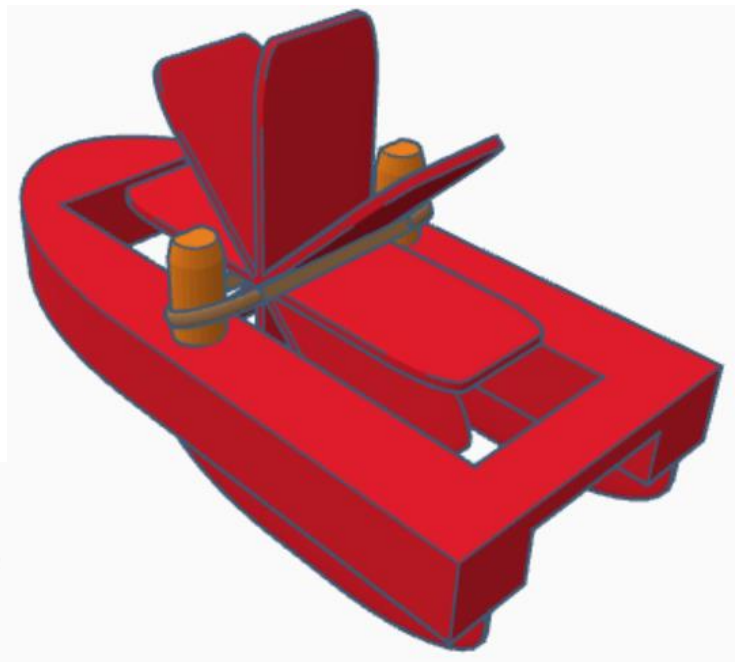


T I N
K E R
C A D

Paddle Boat



Contents:

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Disclaimer:

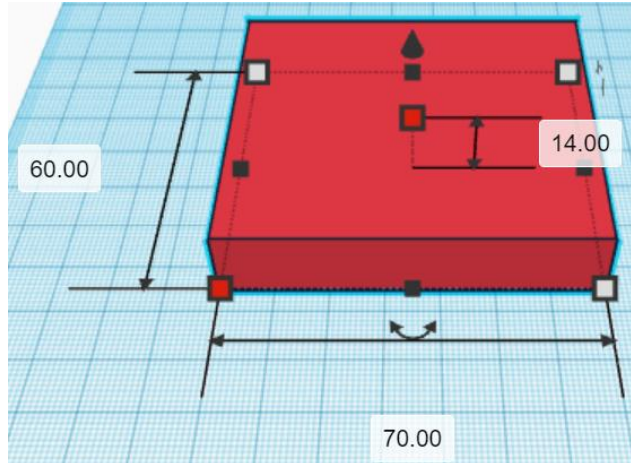
Locations of objects move on a regular basis in TinkerCAD. Although locations of objects are stated, that is the location at the time of publication. This publication has no association with TinkerCAD and does not control when TinkerCAD moves objects.

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

Stern:

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

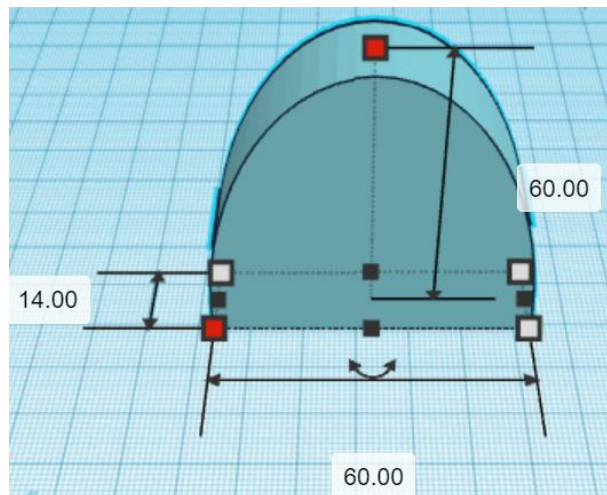
Change the dimensions to
70mm X direction,
60mm Y direction, and
14mm Z direction.



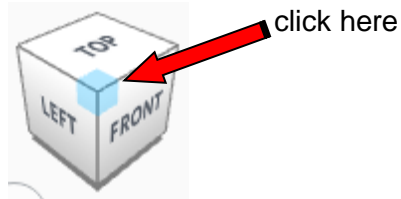
Bow:

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

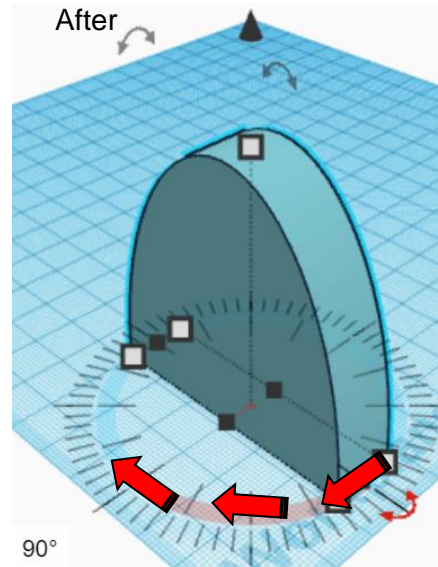
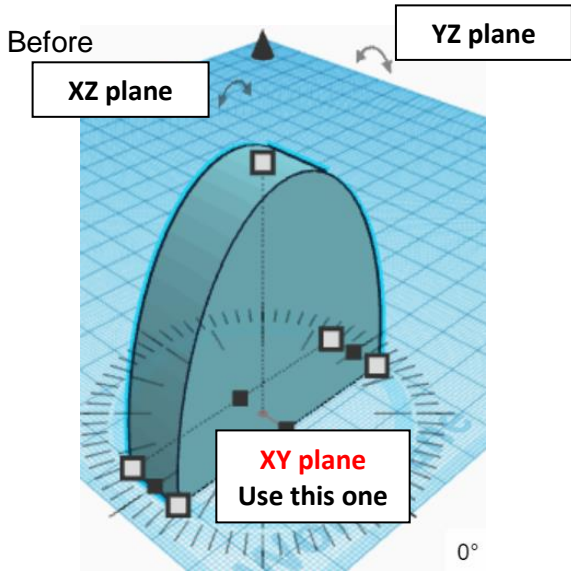
Change the dimensions to
60mm X direction,
14mm Y direction, and
60mm Z direction.



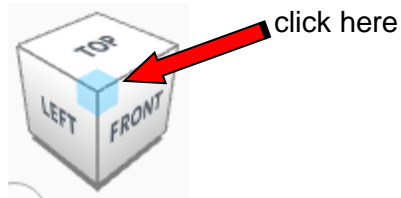
Go to TOP LEFT FRONT view for rotations



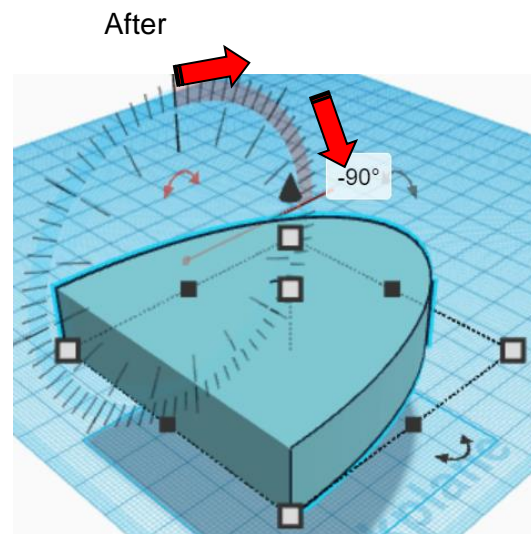
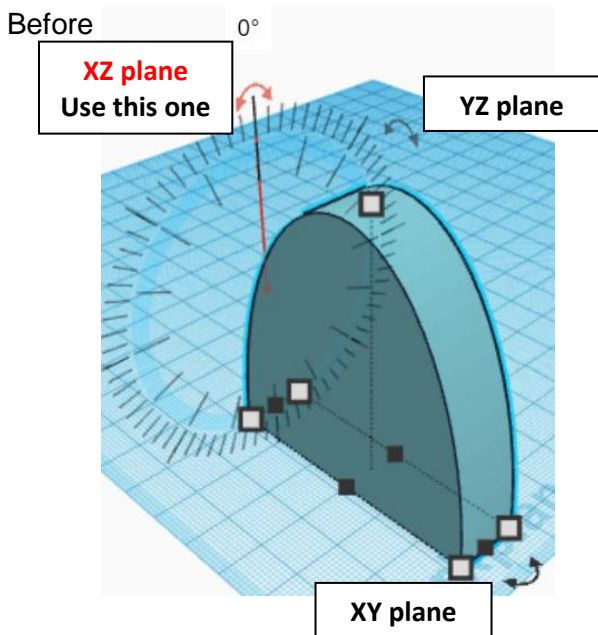
Rotate the Bow clockwise 90 degrees in XY plane.



Go to TOP LEFT FRONT view for rotations



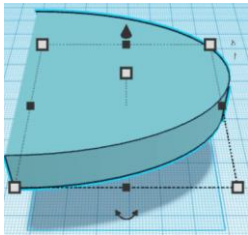
Rotate the Bow clockwise 90 degrees in XZ plane.



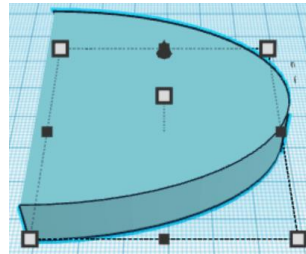
Set on Workplane:

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

Before

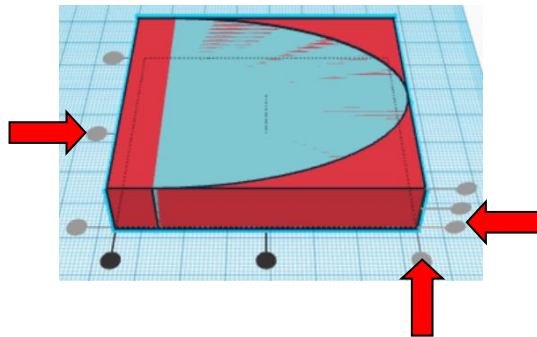


After



Align Stern and Bow

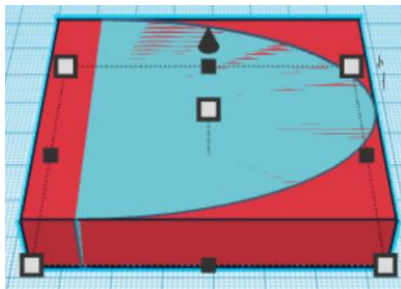
right in X direction,
centered of Y direction, and
bottom of Z direction.



Move Stern (Must be in home view for this to work!)
move left in negative X direction 60mm

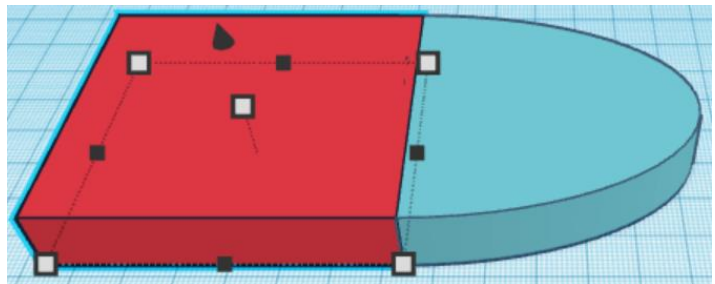
Hint: Select Stern and push left arrow key 60 times.
Or
Select Stern and hold shift and push left arrow key 6 times.

Before



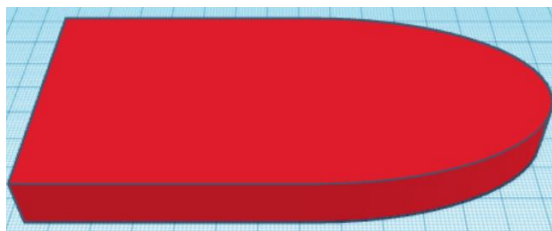
← 60mm
Left

After



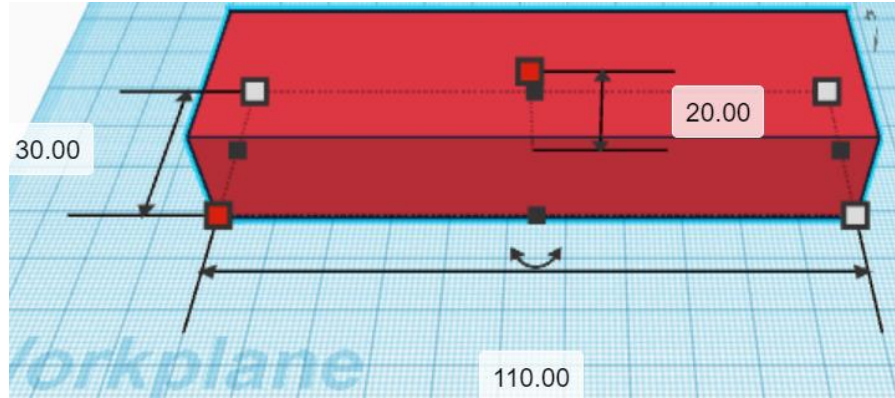
Group Stern and Bow

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



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

Change the dimensions to 110mm X direction, 30mm Y direction, and 20mm Z direction.

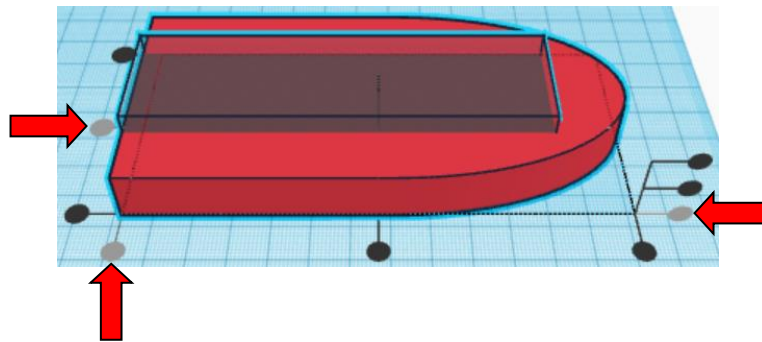


Change Boat Cutout to Hole
by selecting Boat Cutout and typing "h".

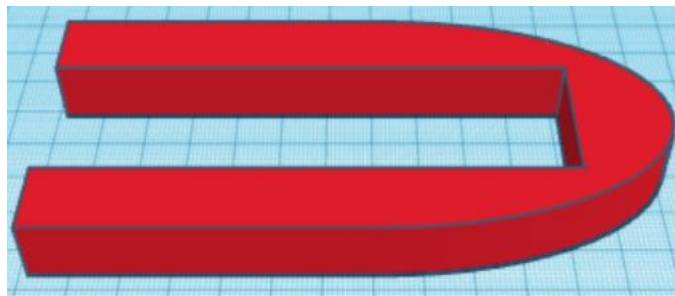


Align Boat and Boat Cutout

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

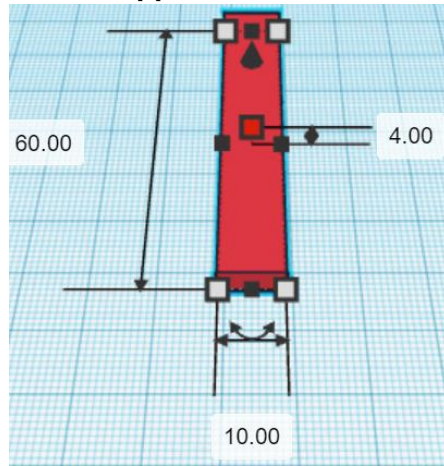


Group Boat and Boat Cutout
From now on this will be called the **Boat**



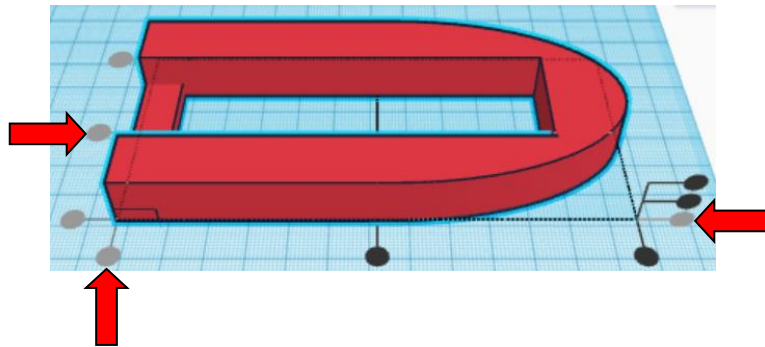
Bring in a Box, located in Basic Shapes on the right 1 shapes down.
From now on this will be called the **Bow Support**.

Change the dimensions to
10mm X direction,
60mm Y direction, and
4mm Z direction.



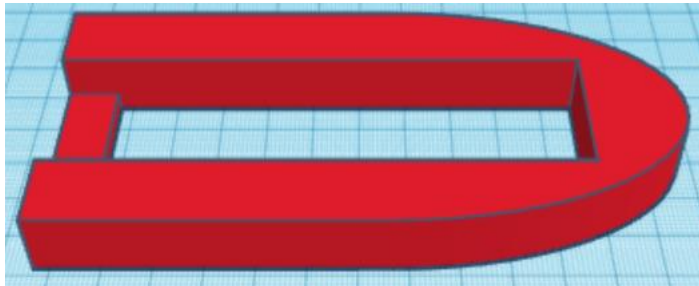
Align Boat and Bow Support

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



Group Boat and Bow Support

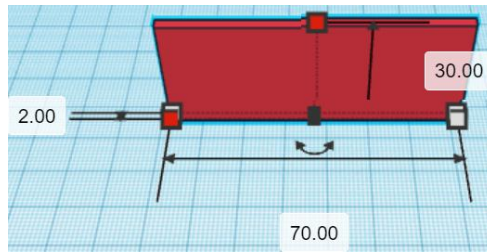
From now on this will be called the **Boat**



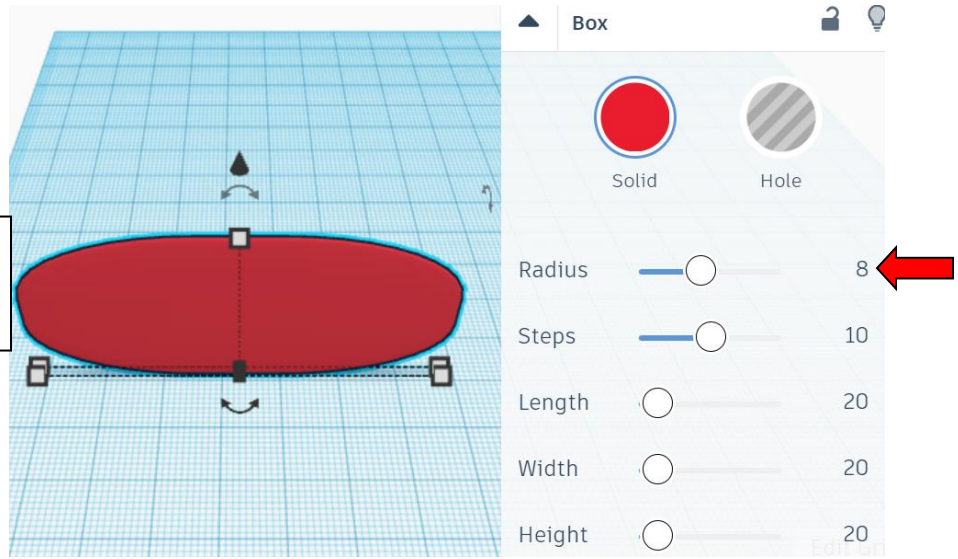
Fins:

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

Change the dimensions to
70mm X direction,
2mm Y direction, and
30mm Z direction.



Change Shape settings to:
Radius from 0 to 8

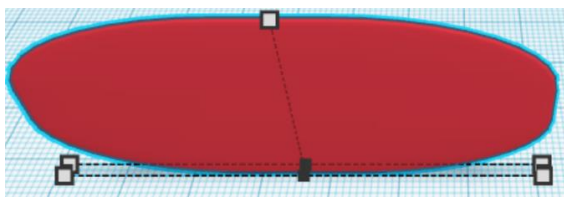


Duplicate Fin 1 time
The duplicate Fin will be called **Fin Top**

Move Fin Top (Must be in home view for this to work!)
move back in positive Y direction 45mm

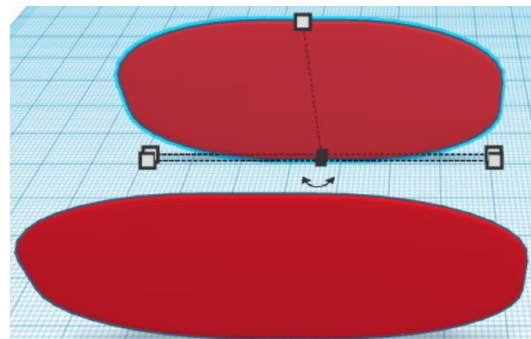
Hint: Select Fin Top and push up arrow key 45 times.
or
Select Body and hold down shift and push down arrow key 4 time.
Then release shift and push down arrow key 5 more times.

Before

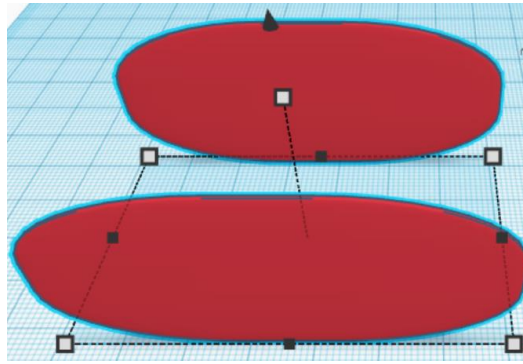


45mm
Up

After

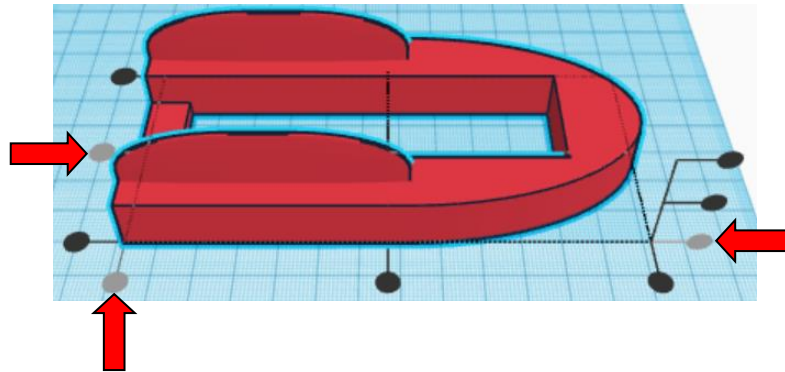


Group Fin and Fin Top
From now on this will be called the **Fins**

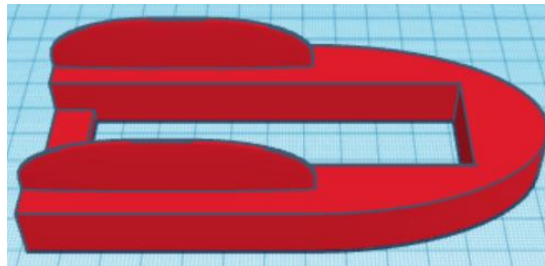


Align Boat and Fins

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

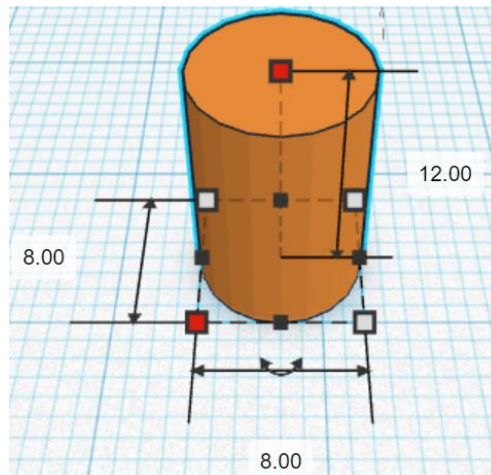


Group Boat and Fins
From now on this will be called the **Boat**



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

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



Duplicate Peg Hole 1 time

The duplicate Peg Hole will be called **Peg Hole Top**

Move Peg Hole Top (Must be in home view for this to work!)

move back in positive Y direction 45mm

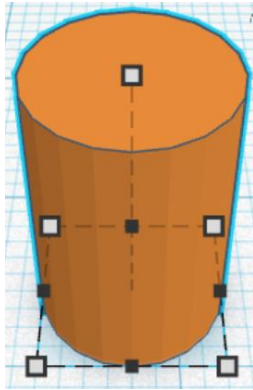
Hint: Select Peg Hole Top and push up arrow key 45 times.

or

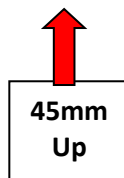
Select Peg Hole Top and hold down shift and push down arrow key 4 time.

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

Before



After



Group Peg and Peg Hole Top

From now on this will be called the **Peg Holes**



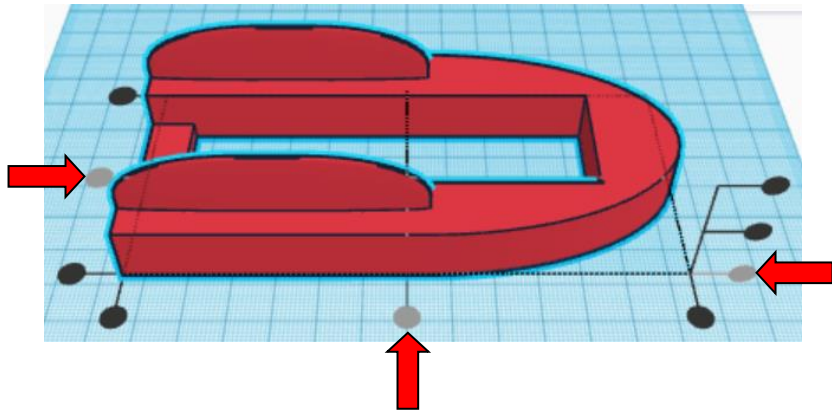
Change Peg Holes to **Hole**

by selecting Peg Holes and typing "h".



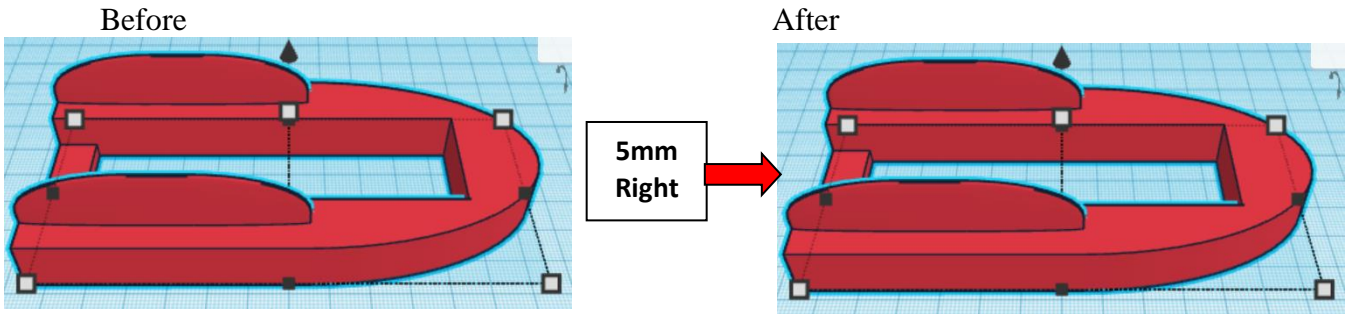
Align Boat and Peg Holes

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



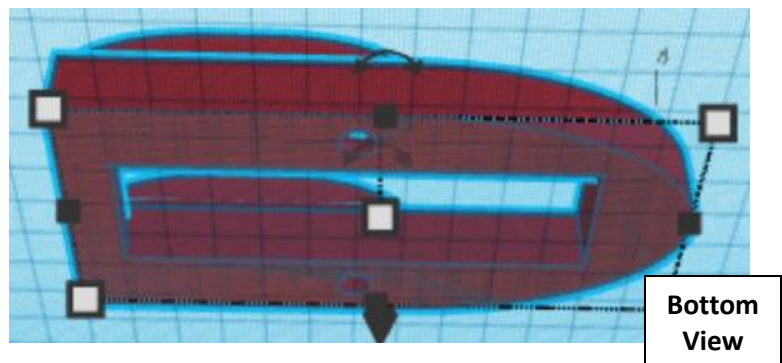
Move Boat (Must be in home view for this to work!)
move right in positive X direction 5mm

Hint: Select Boat and push right arrow key 5 times.



Group Boat and Peg Holes

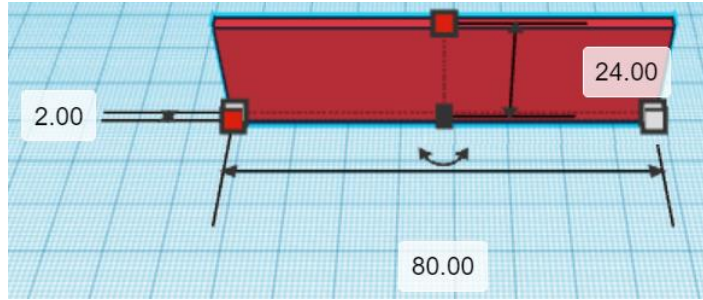
From now on this will be called the **Boat**



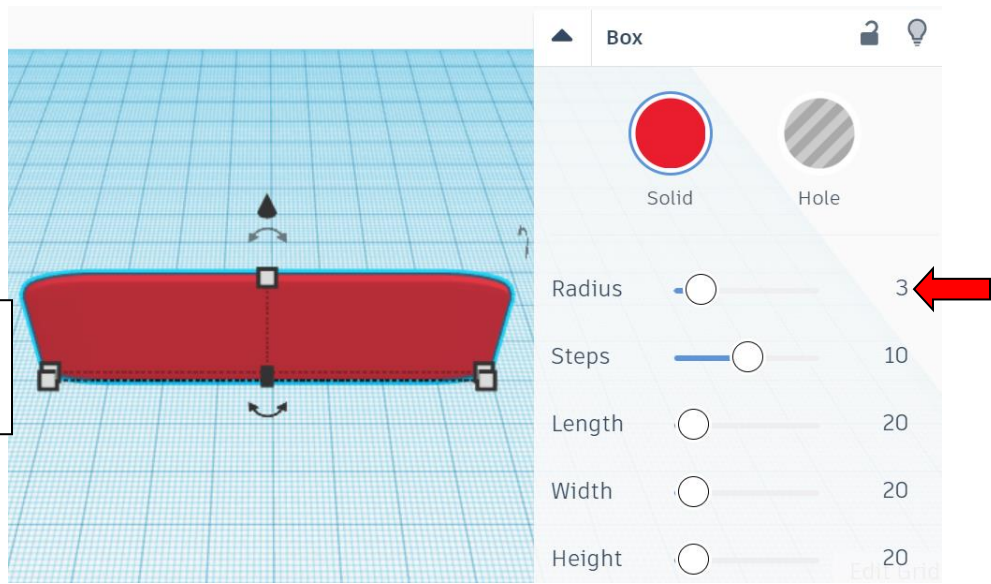
Paddles:

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

Change the dimensions to
80mm X direction,
2mm Y direction, and
24mm Z direction.

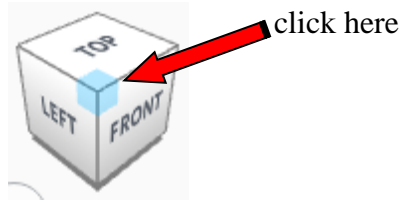


Change Shape settings to:
Radius from 0 to 3



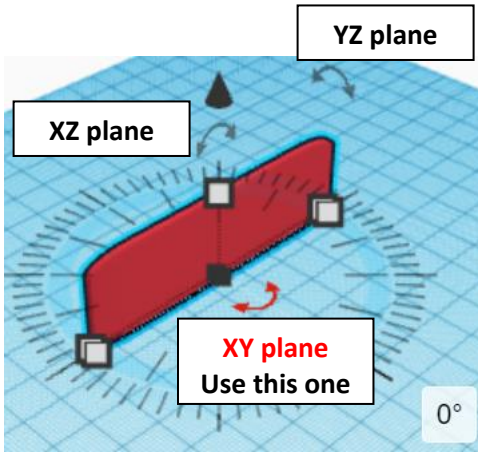
Duplicate Paddle 1 time
The duplicate Paddle will be called **Paddle 1**

Go to TOP LEFT FRONT view for rotations

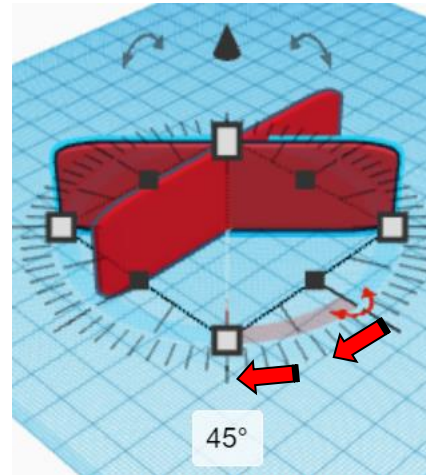


Rotate the Paddle 1 clockwise 45 degrees in XY plane.

Before

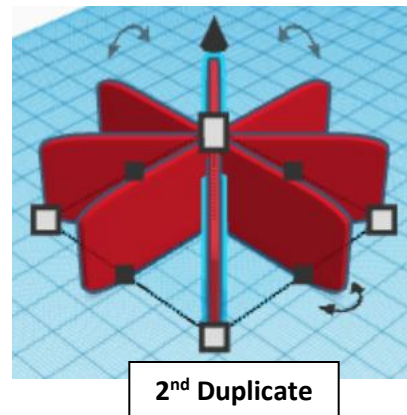
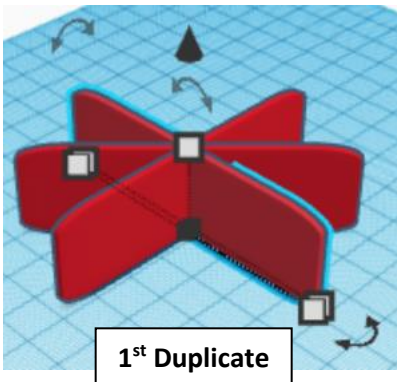


After



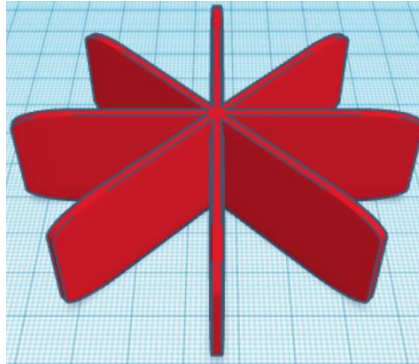
Immediately Duplicate 2 more times

As long as there was no other action, the Paddle 1 will duplicate and rotate 45 degrees, and then again.



Group all Paddles

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

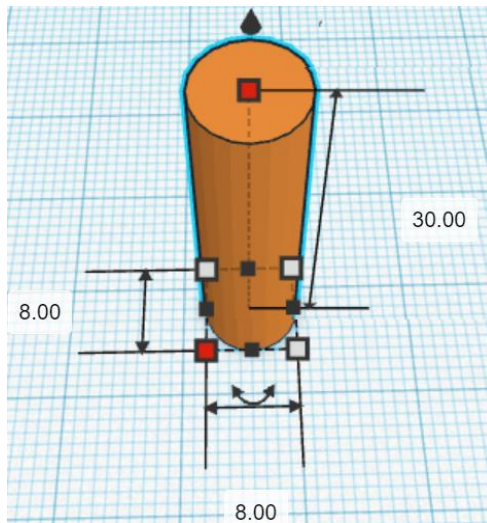


Pegs:

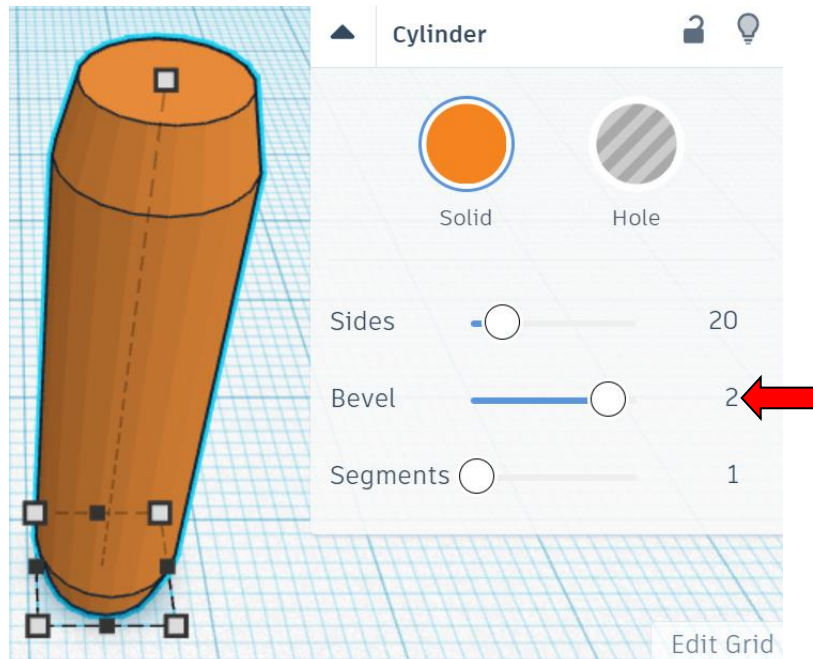
Bring in a Cylinder, located in Basic Shapes on the left 2 shapes down.

From now on this will be called the **Peg**.

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

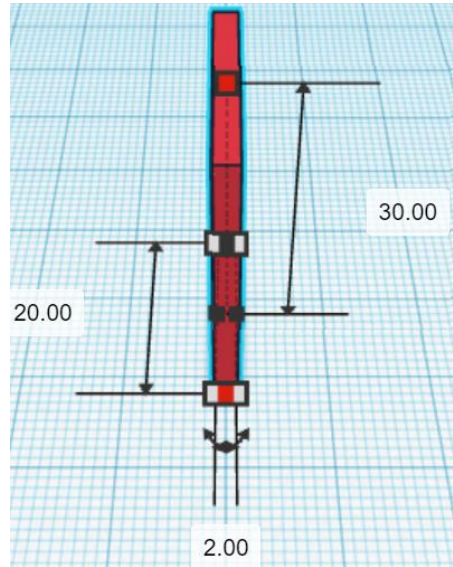


Change Shape settings to:
Bevel from 0 to 2



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

Change the dimensions to
2mm X direction,
20mm Y direction, and
30mm Z direction.

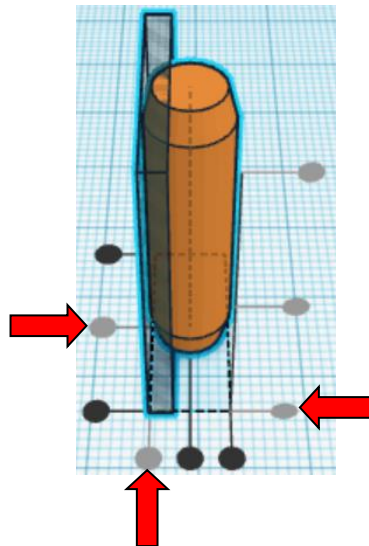


Change Peg Cutout to Hole
by selecting Peg Cutout and typing "h".

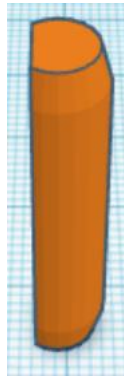


Align Boat and Peg Holes

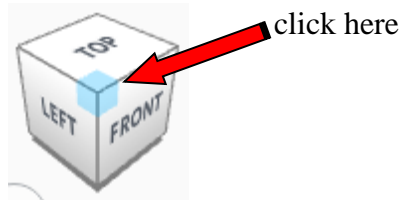
left in X direction,
centered of Y direction, and
bottom of Z direction.



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

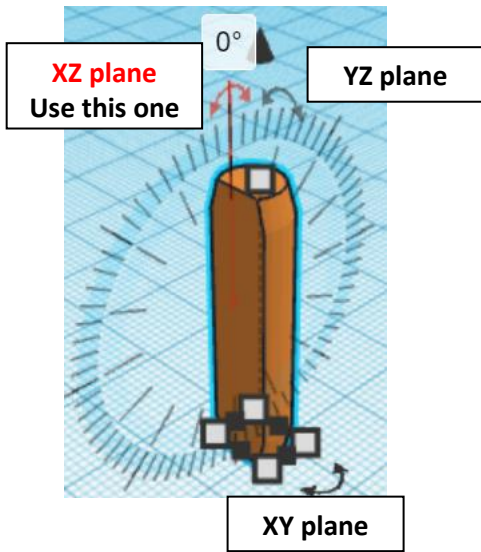


Go to TOP LEFT FRONT view for rotations

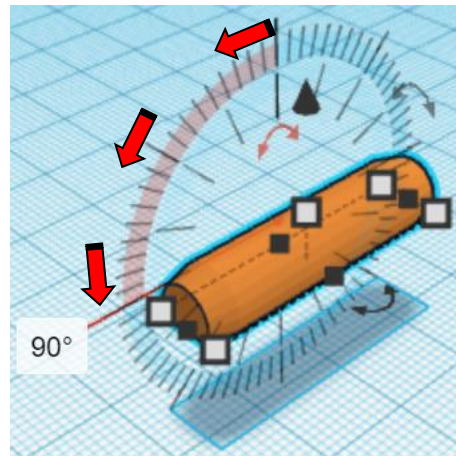


Rotate the Peg counter-clockwise 90 degrees in XZ plane.

Before



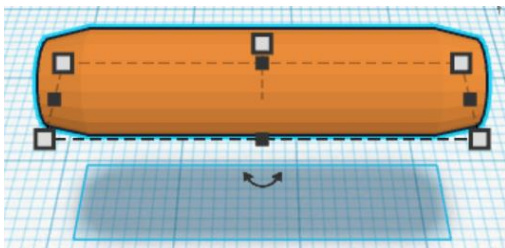
After



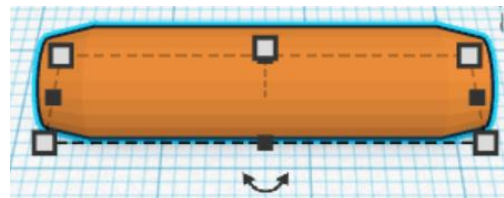
Set on Workplane:

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

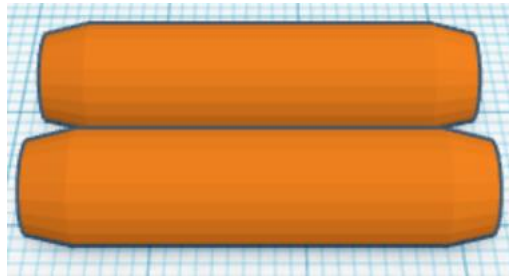
Before



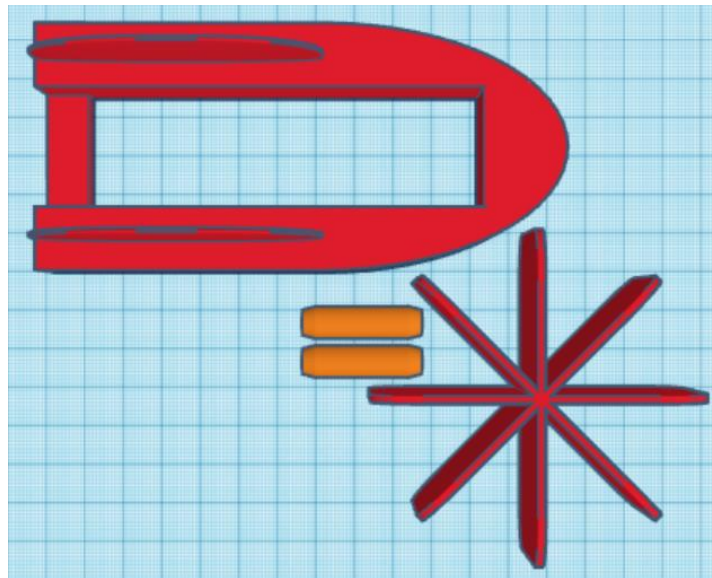
After



Duplicate Peg 1 time
Set the duplicate Peg to the side

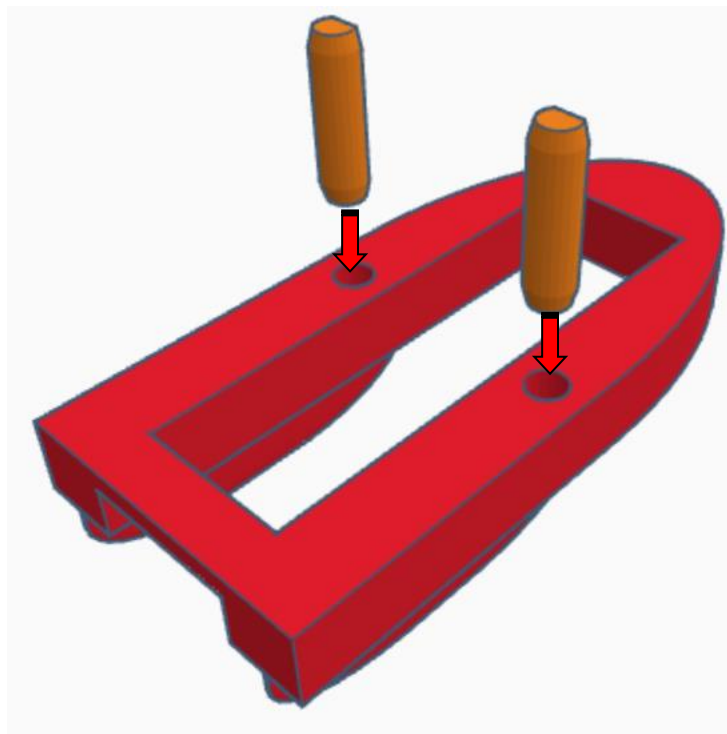


Print all the pieces.

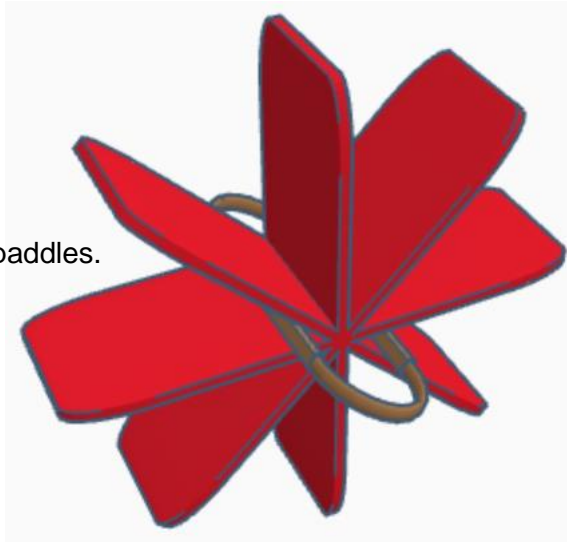


Assembly Instructions:

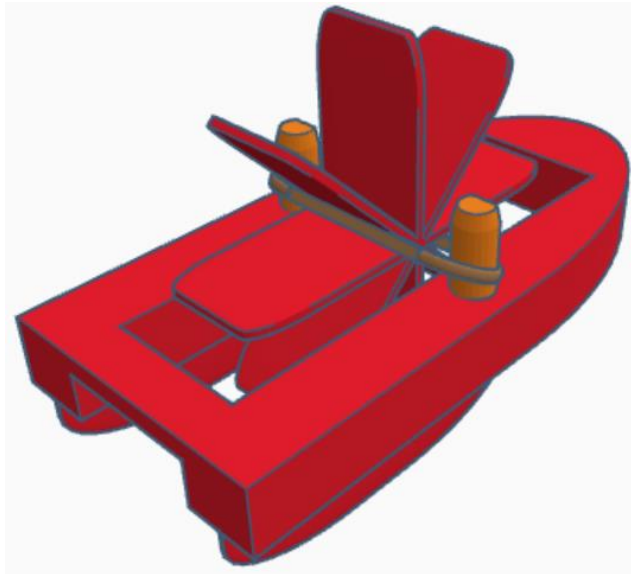
Push the pegs into the peg cutouts.



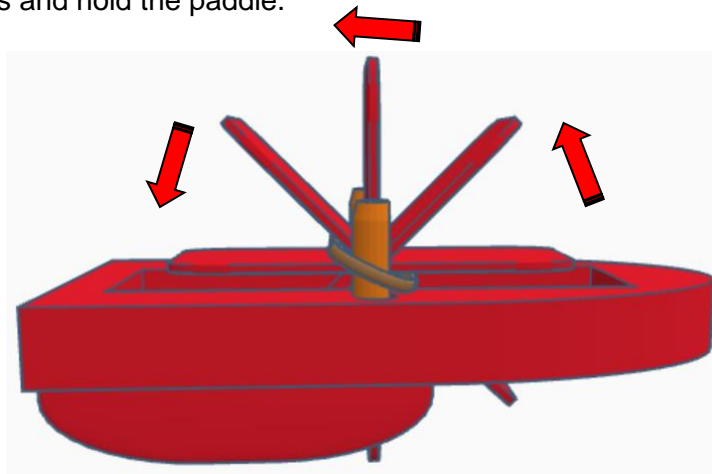
Get a rubber band and put it around the paddles.



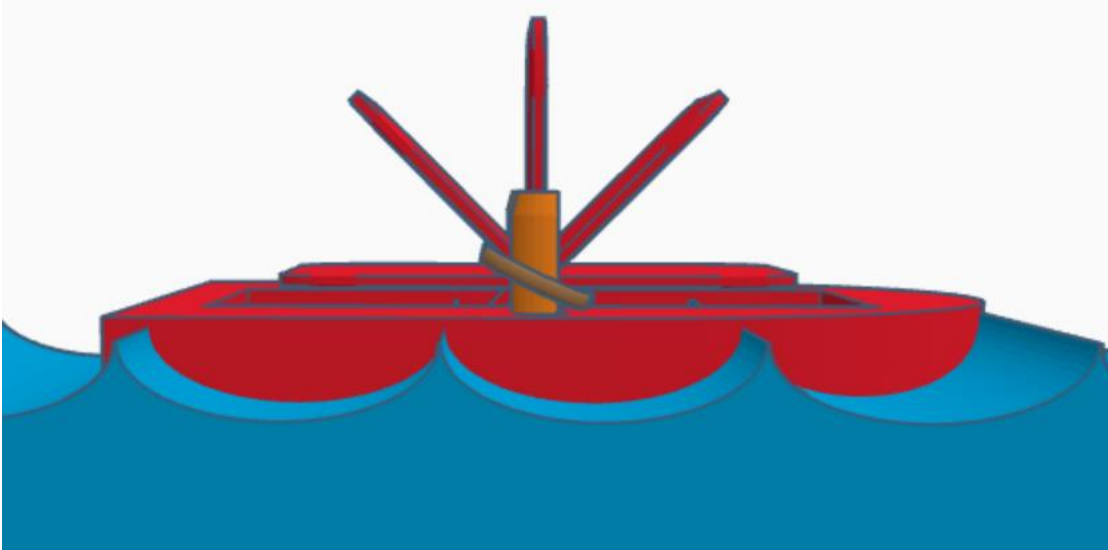
Slide the rubber band over the pegs.



Twist the paddles backwards many times and hold the paddle.



Place boat in water release the paddle and boat.
The rubber band will turn the paddles in the water and propel the boat forward.



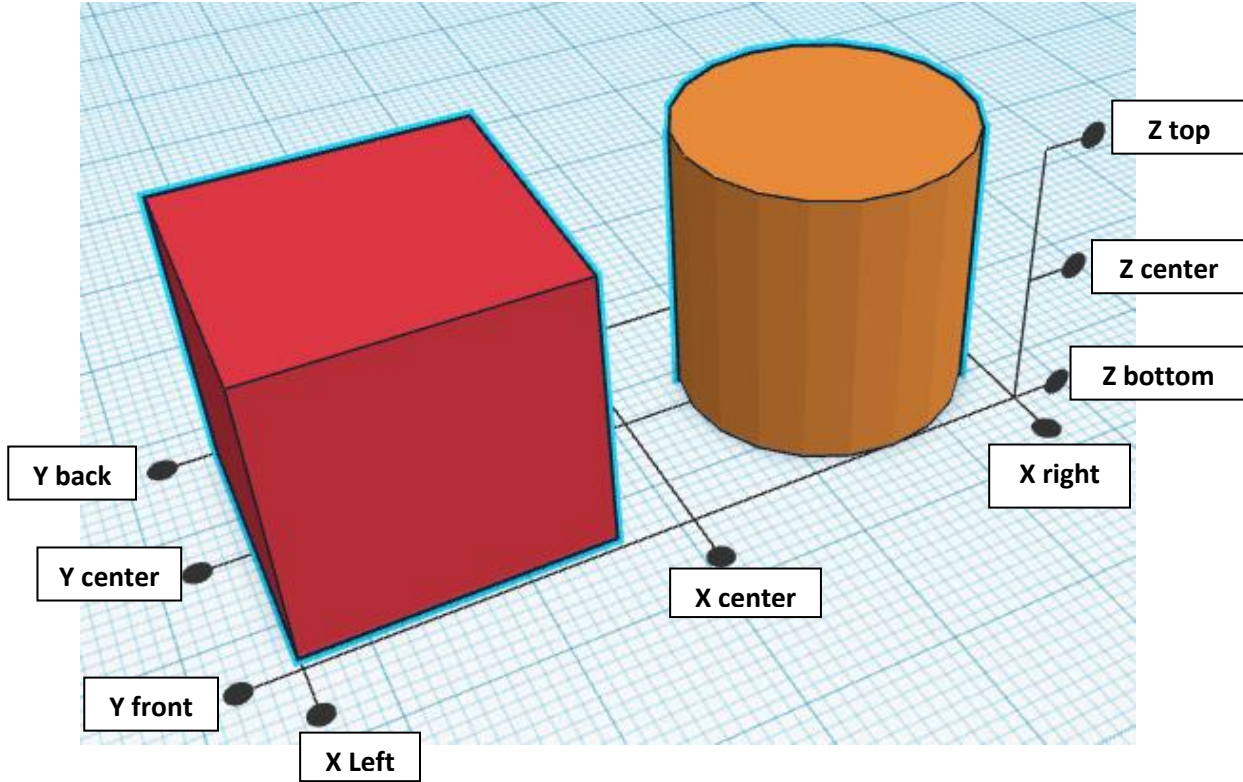
Have fun!!

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

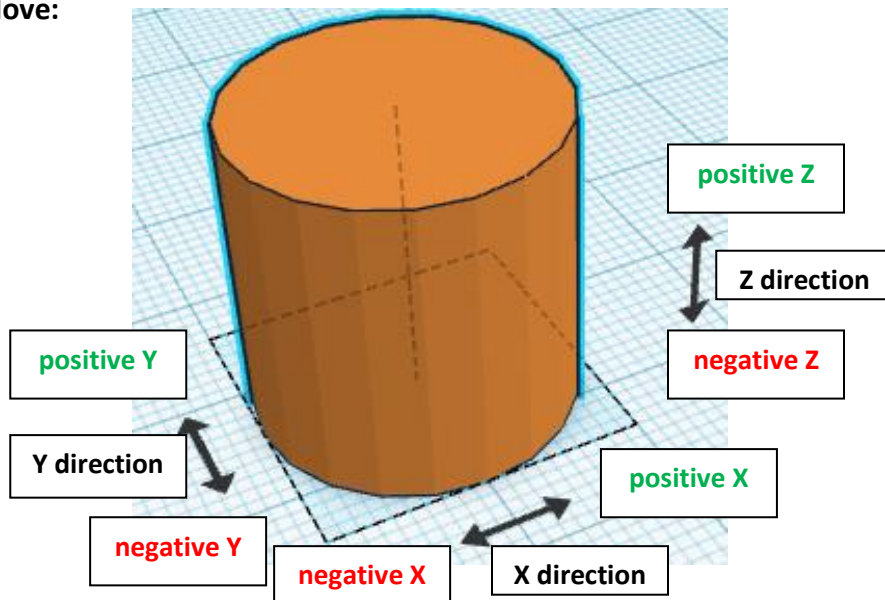
Always be in the "home view" when doing any of these!!!



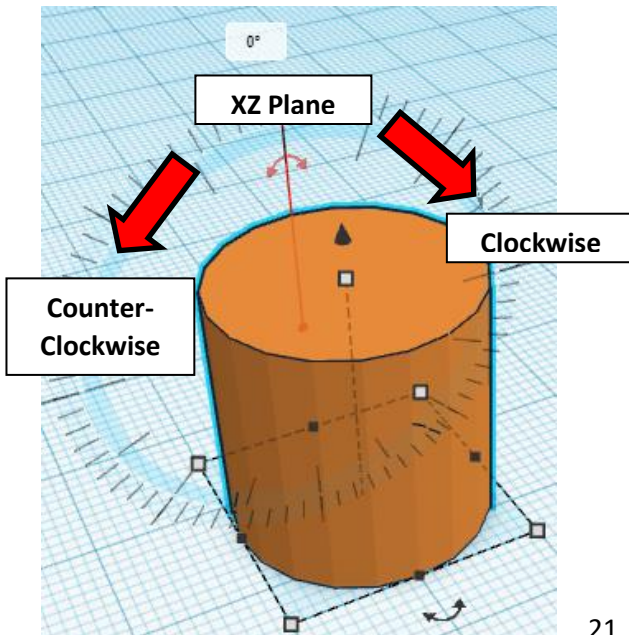
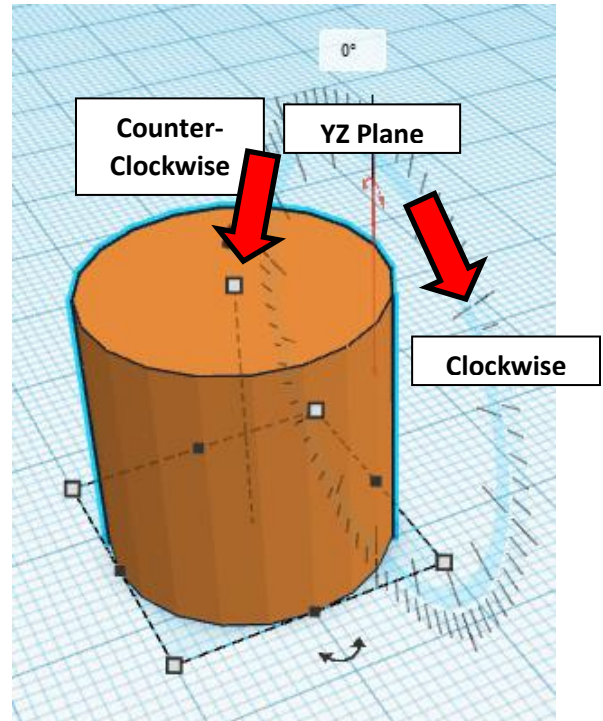
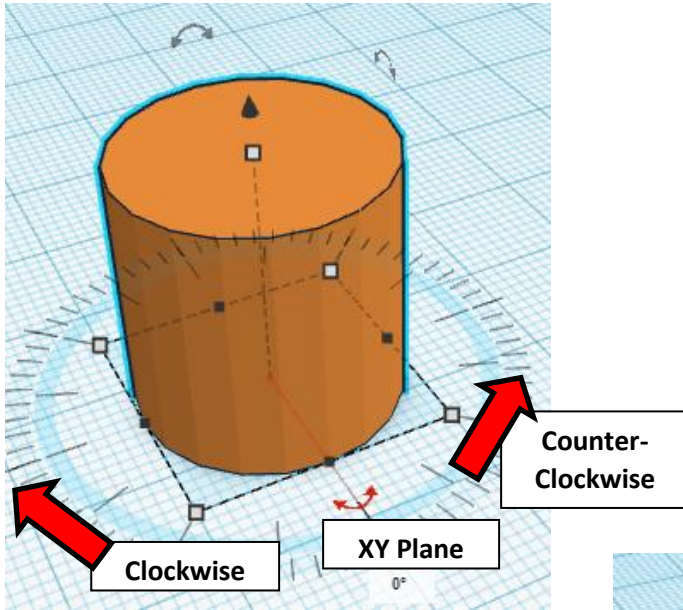
Aligning:



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

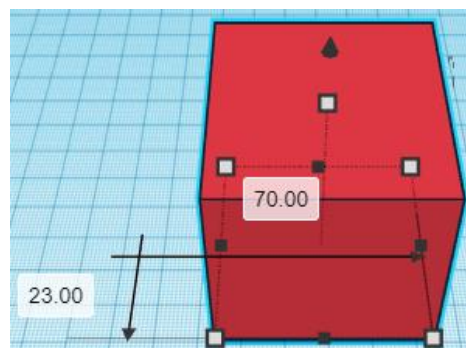
Moving Object(s):

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.

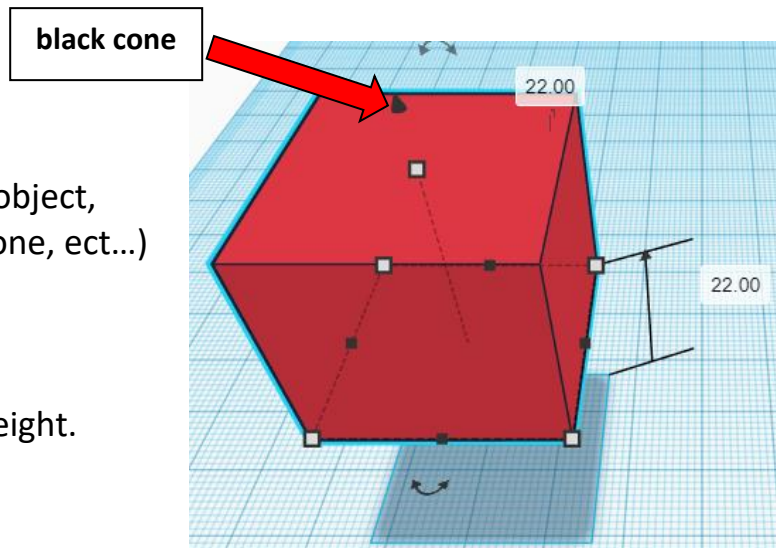


Moving Object(s) continued:

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.

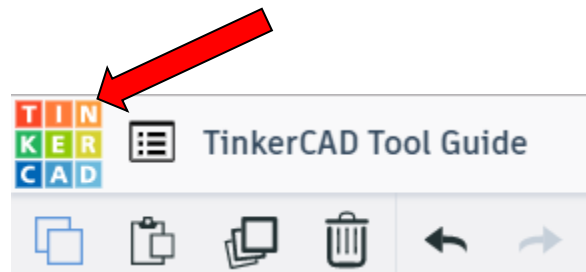


Hold control button and hold shift button
and use up and down arrow keys to move the object in 10mm increments.

Using on screen icons:

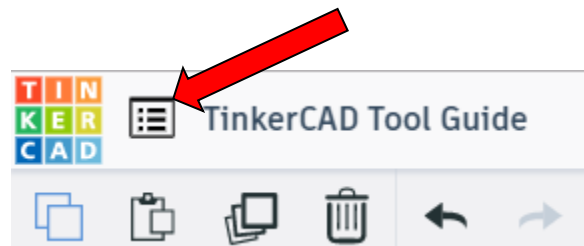
TinkerCAD main screen:

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



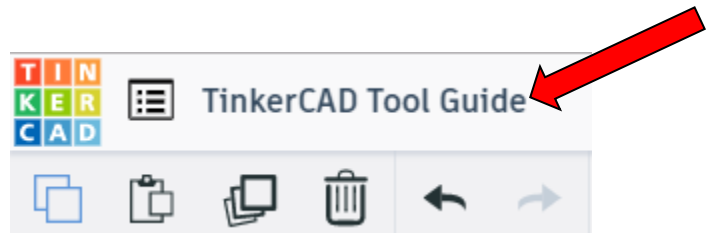
My designs:

Pulls up menu of your designs.



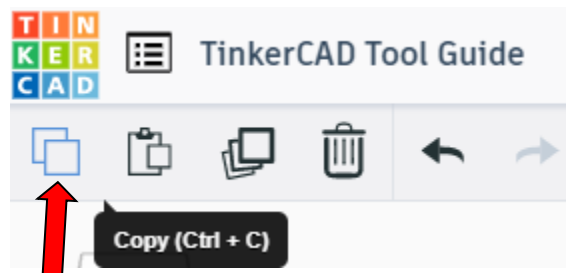
Design name:

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



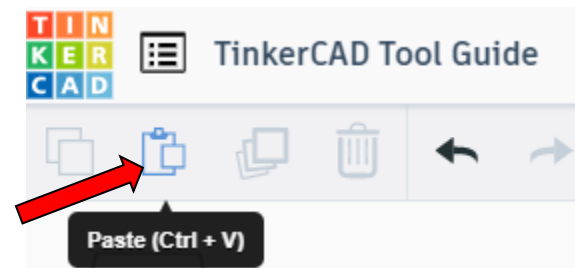
Copy:

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



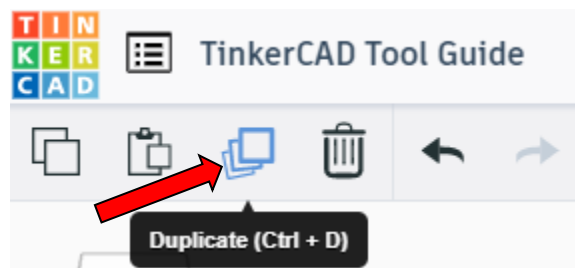
Paste:

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



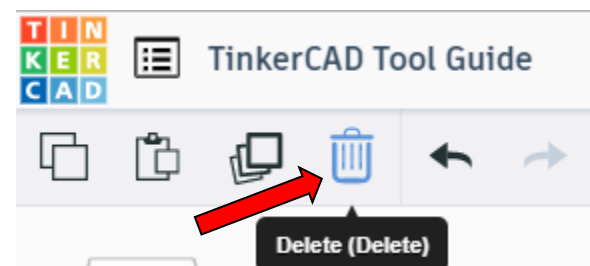
Duplicate:

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.



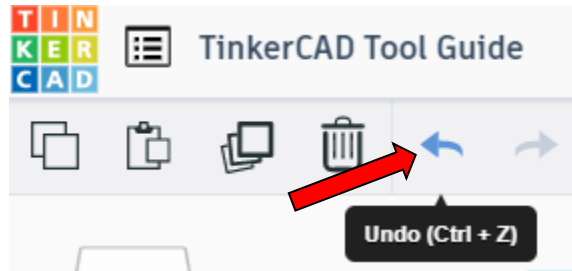
Delete:

Select shape.
Click delete or delete key.



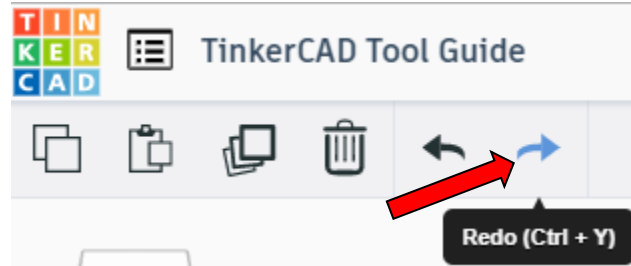
Undo:

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.



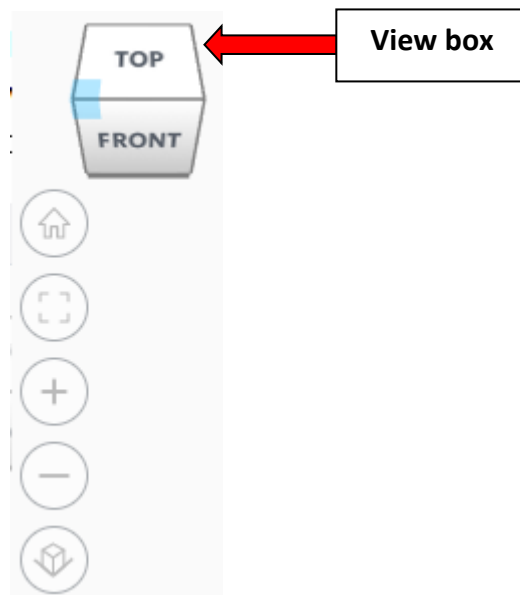
Change View:

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.

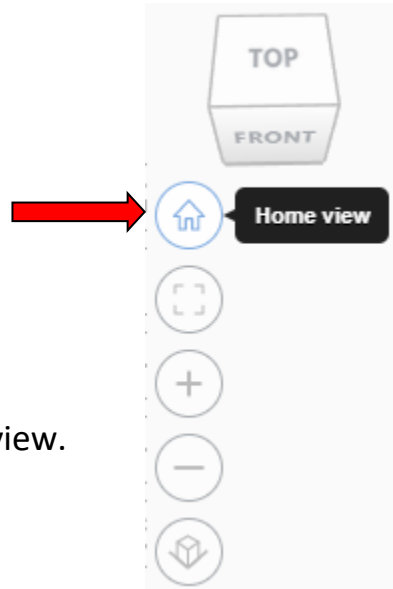


Change view to home view:

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.

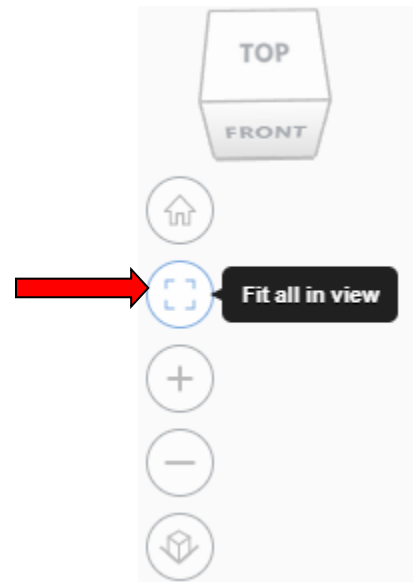


Fit all in view:

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).



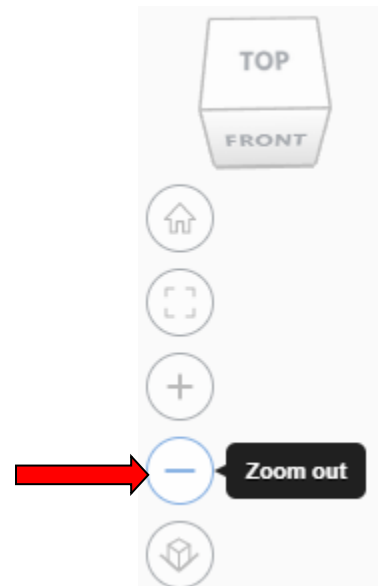
Zoom in:

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



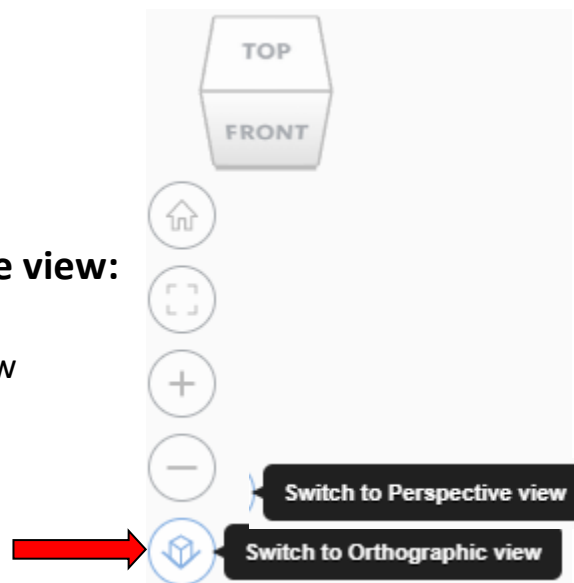
Zoom out:

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



Switching to orthographic and perspective view:

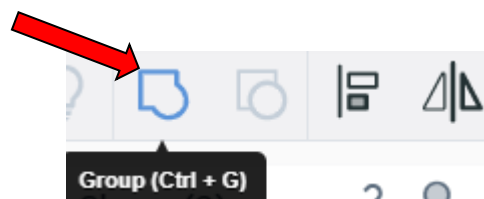
Click the Switch to orthographic/perspective view
To change to your preferred view.



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.

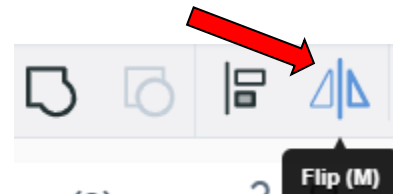
Select the objects to align and click the
align button or click "L"



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