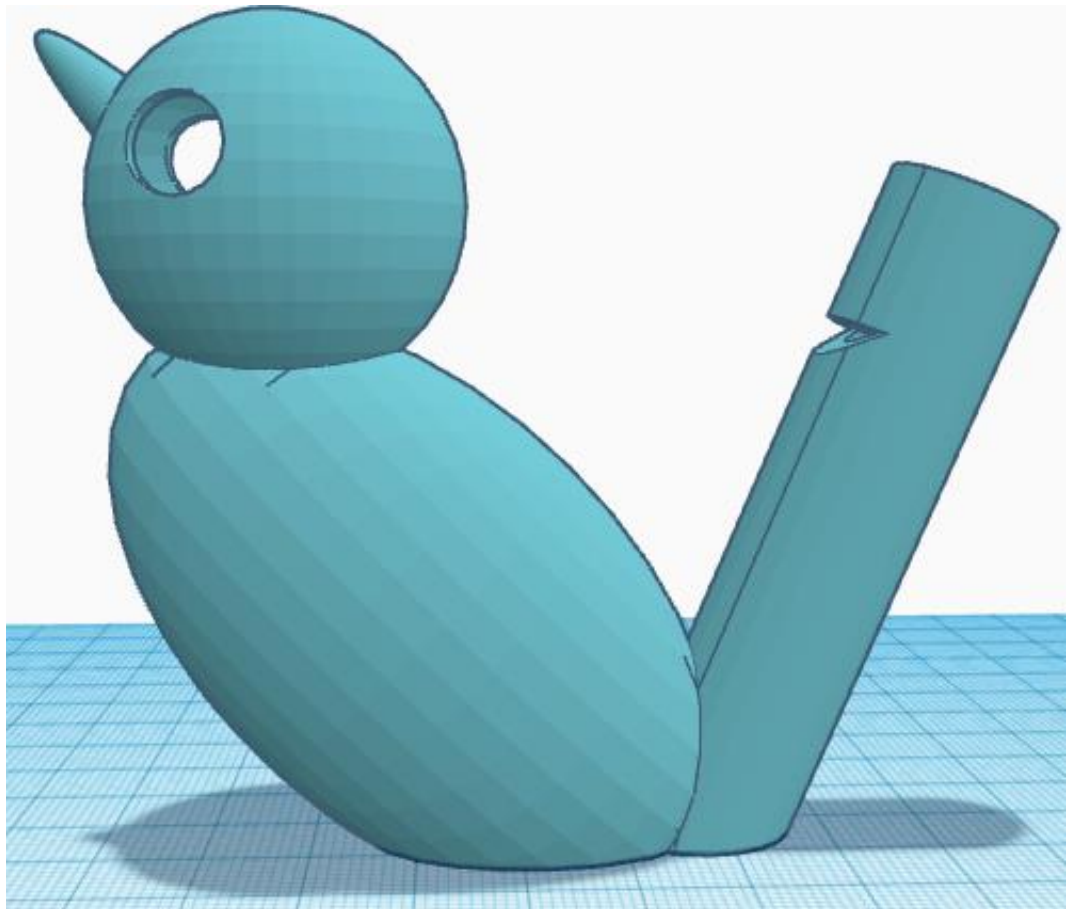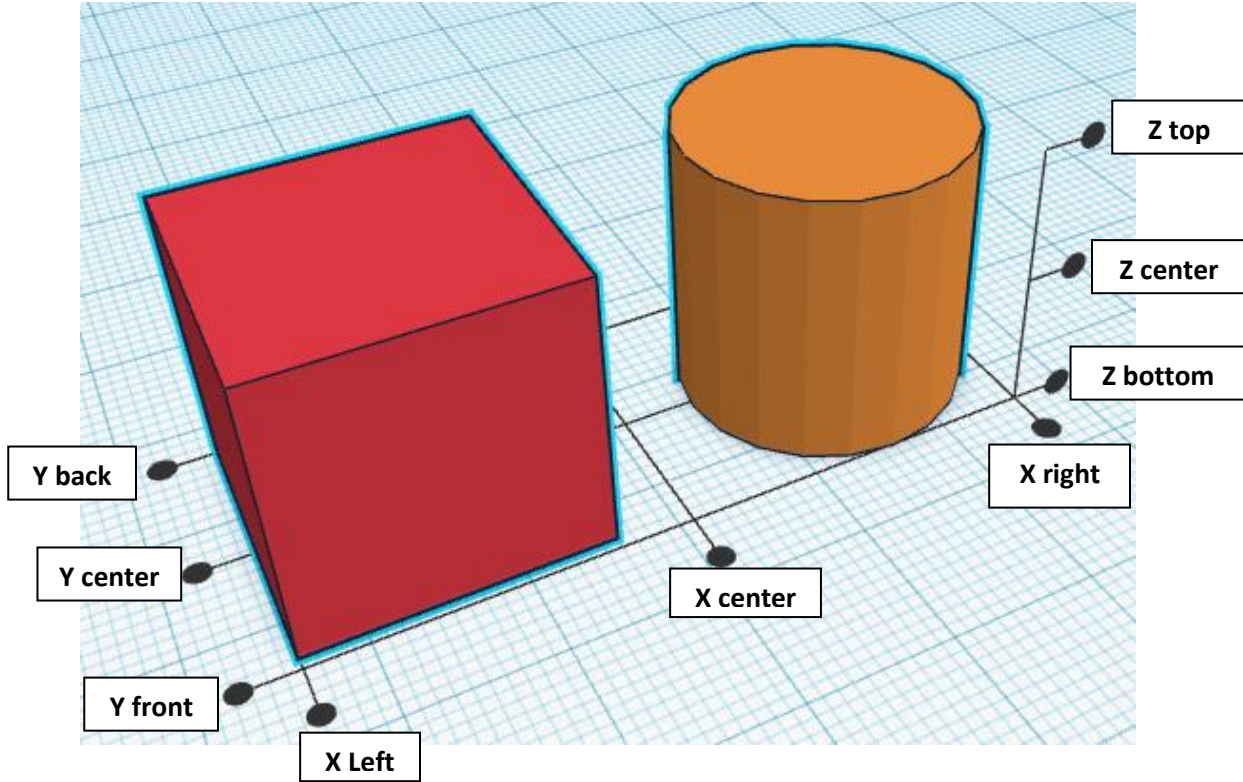# Bird Whistle Project

Reference to Aligning, Flip direction, Move direction, and Rotate direction.
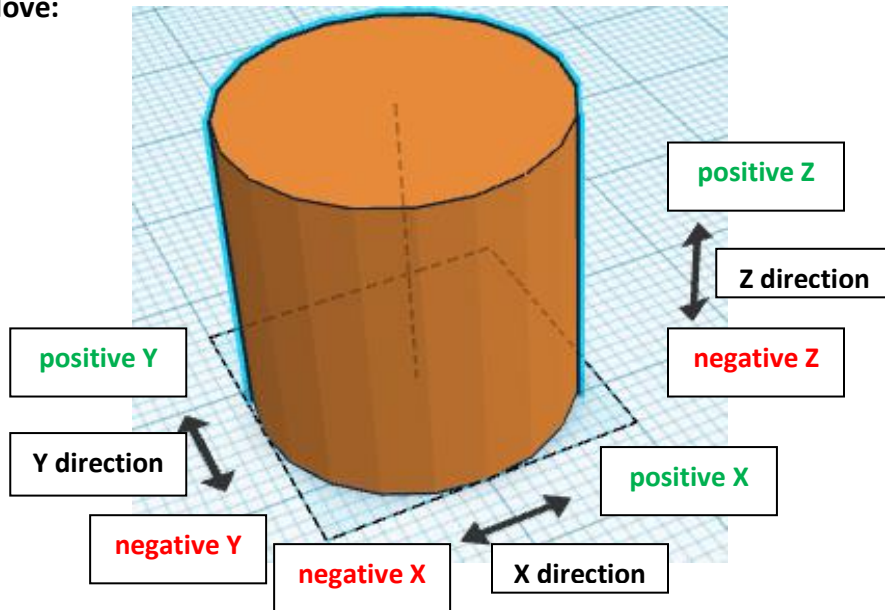
Always be in the "home view" when doing any of these!!!
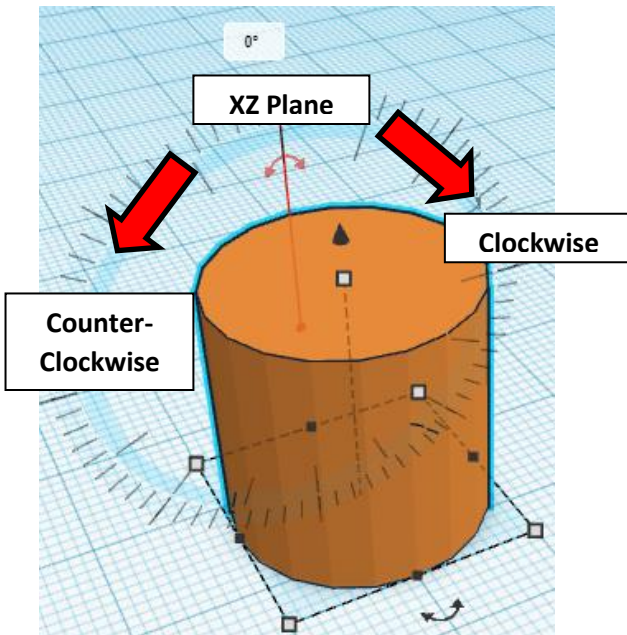
Home view
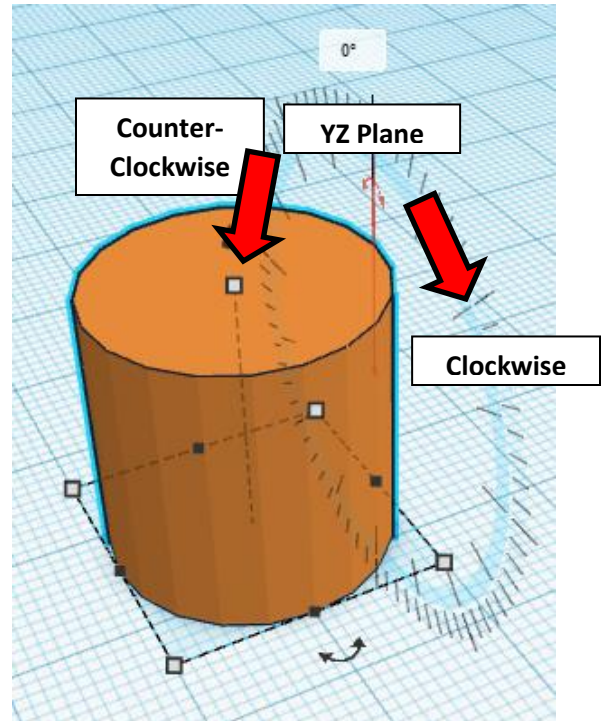
Aligning:

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°

Counter-Clockwise

YZ Plane

0°

Clockwise

XZ Plane

0°

Clockwise

Counter-Clockwise
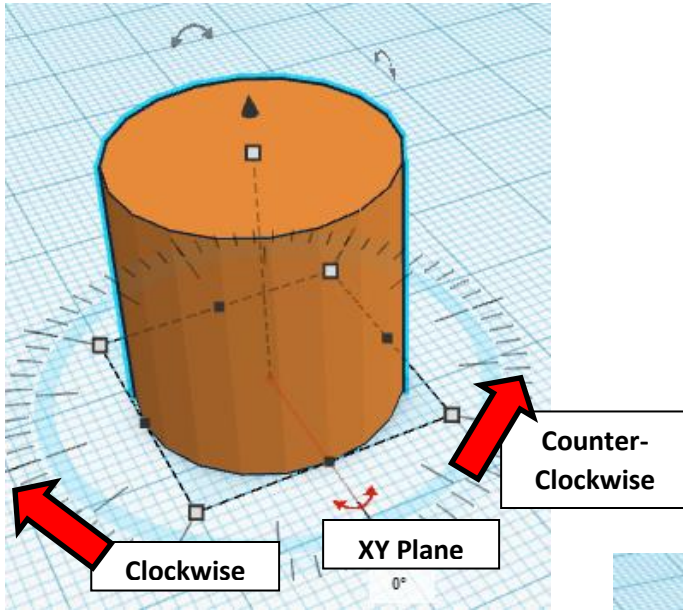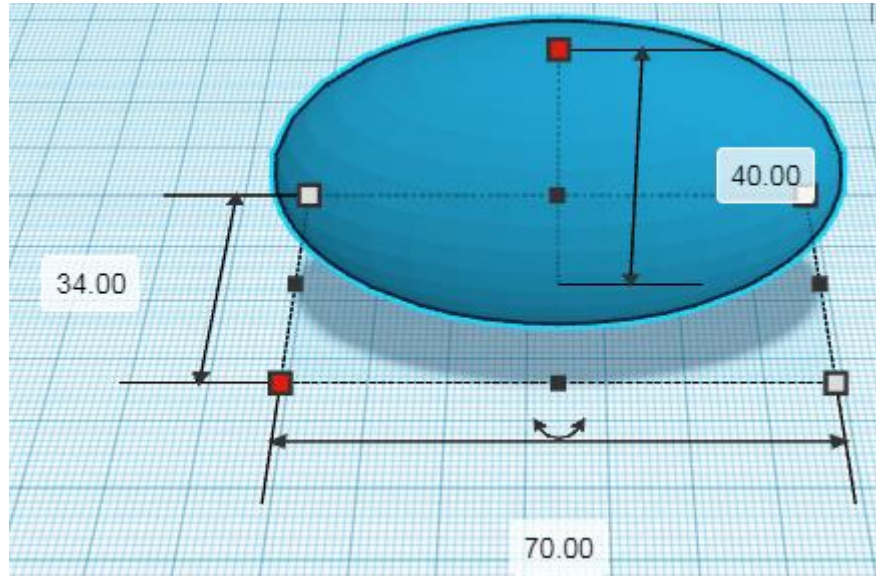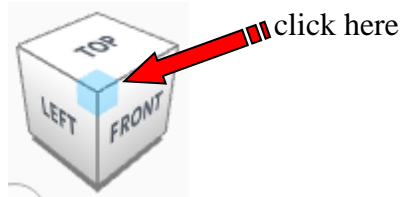
Bird Whistle:

Body:

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

Change the dimensions to
70mm X direction,
34mm Y direction, and
40mm Z direction.

40.00

34.00

70.00

Go to TOP LEFT FRONT view for rotations

TOP

LEFT FRONT

click here

Rotate the Body clockwise 45 degrees in XZ plane.

Before

XZ plane
Use this one

YZ plane

XY plane

After

-45°

Set on Workplane:

Select the <u>Body</u> and type "d" to set the body on the work plane.

Before

After

Head:

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

Change the dimensions to
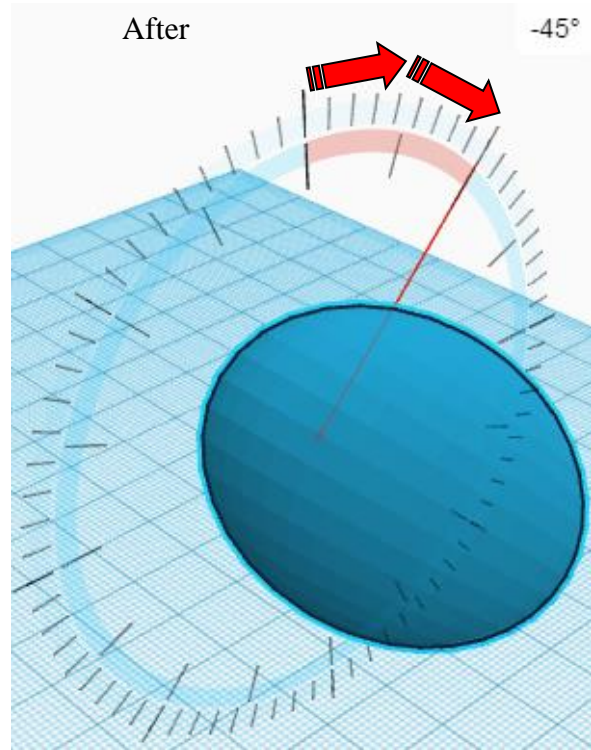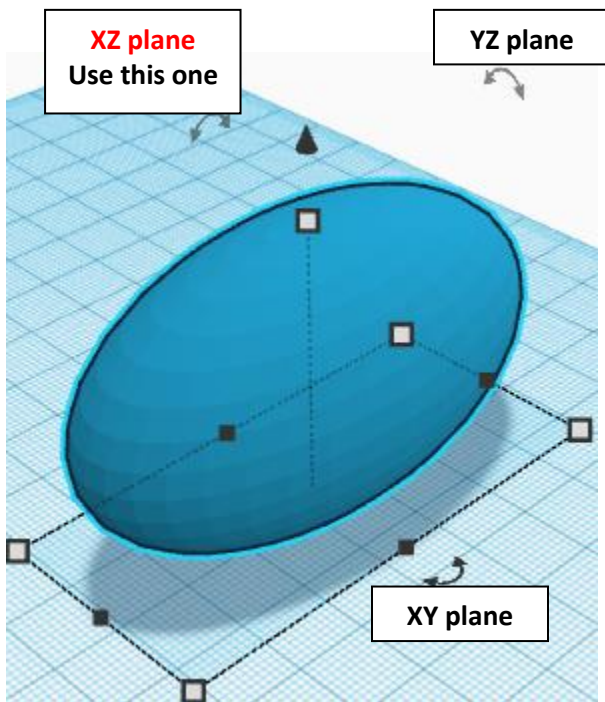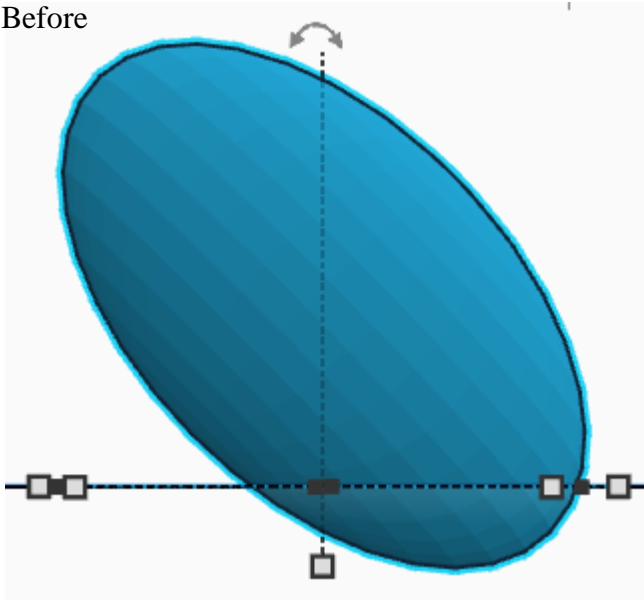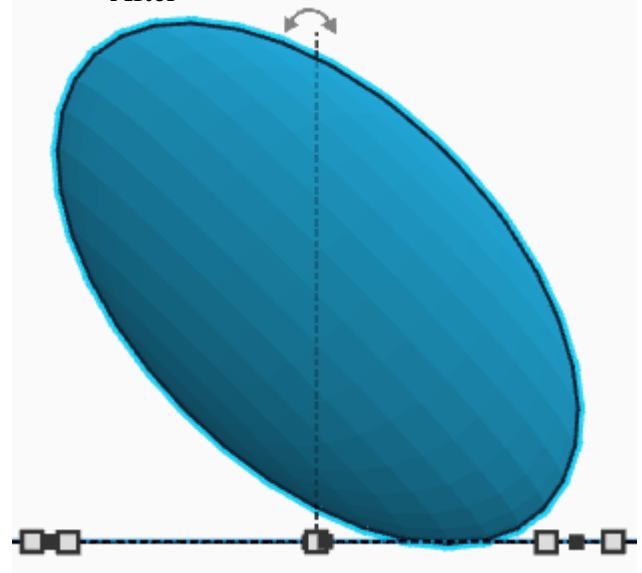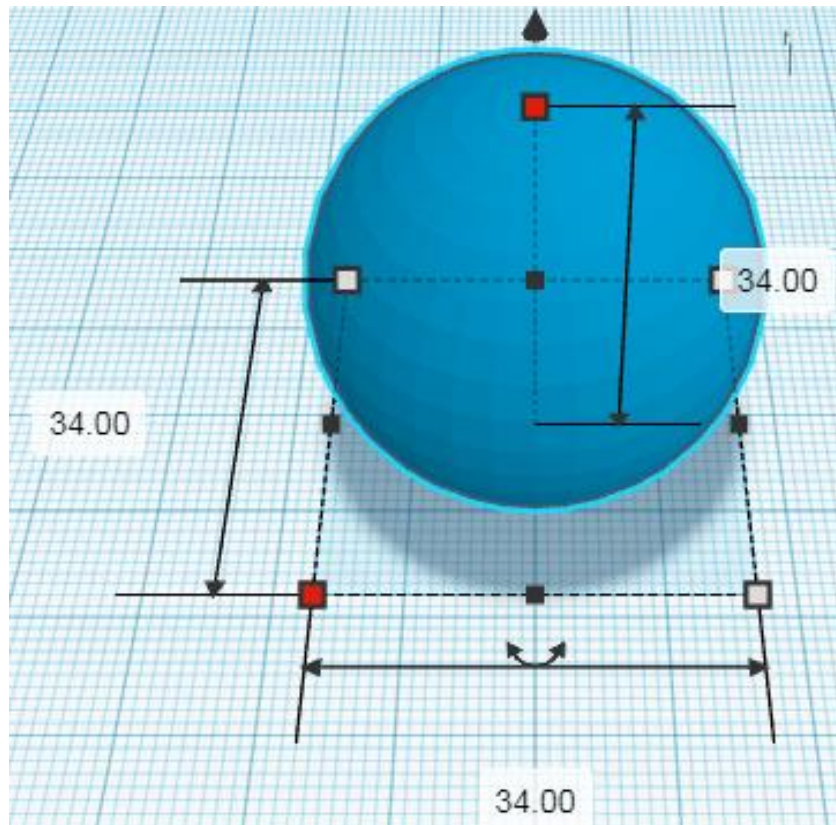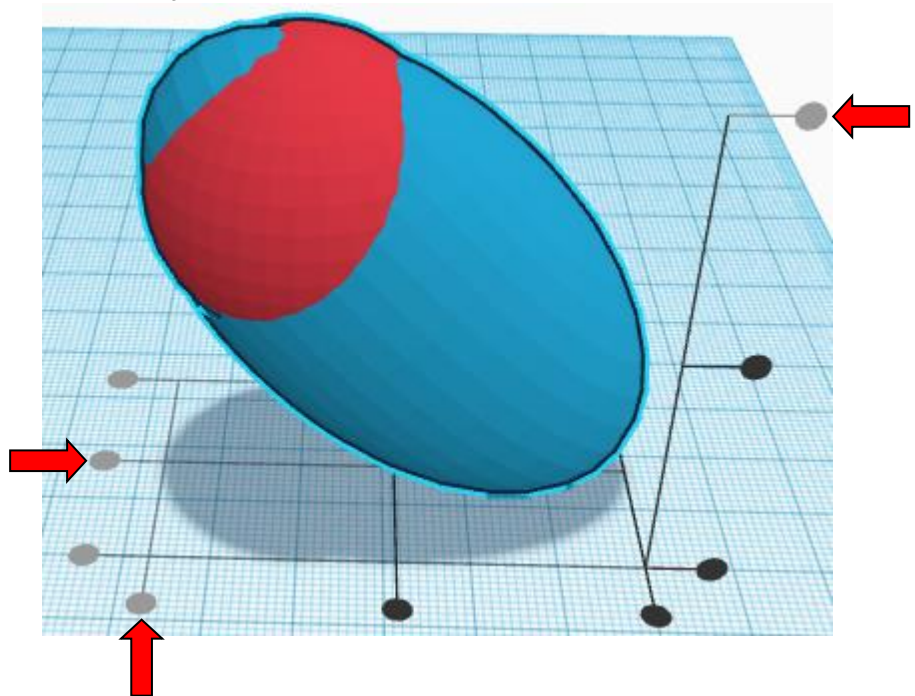34mm X direction,
34mm Y direction, and
34mm Z direction.

34.00

34.00

34.00

Before I align the head and body I am going to change the color on the head to <u>red</u> to better identify what part is the head and what part is the body.

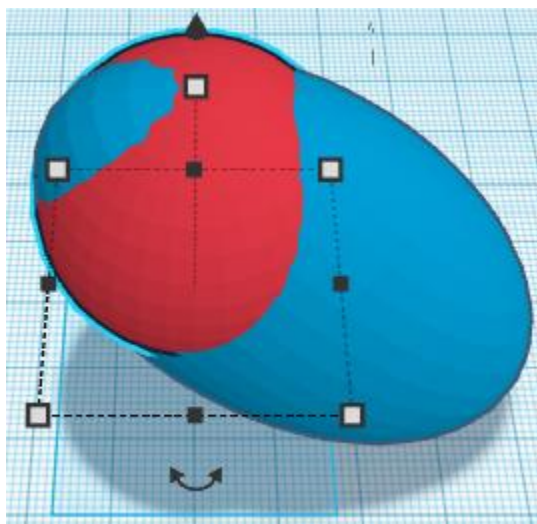**Align** <u>Head</u> and <u>Body</u>

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

Move <u>Head</u>   (Must be in home view for this to work!)
move up in positive Z direction 27mm
and
move left in negative X direction 1mm

Hint: Select <u>Head</u> and hold control down and push up arrow key 27 times. Then release control button and
        push left once.
        or
        Hold down shift and control and push up arrow 2 times and release shift but still hold control down
        and push up arrow 7 times.
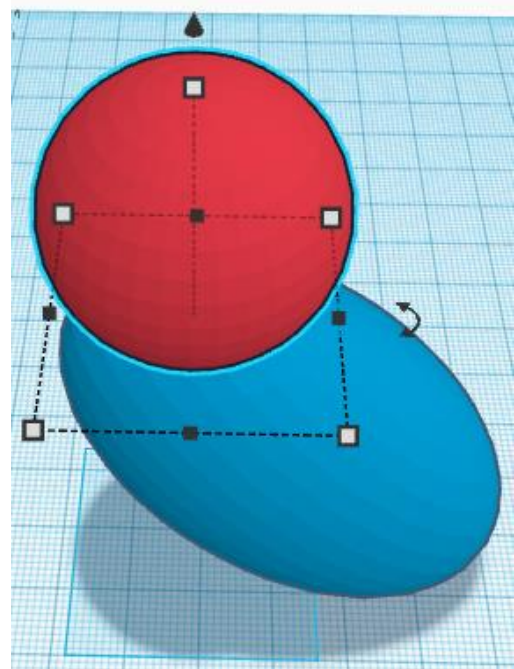   Then release the control button and push left arrow once.

Before   After
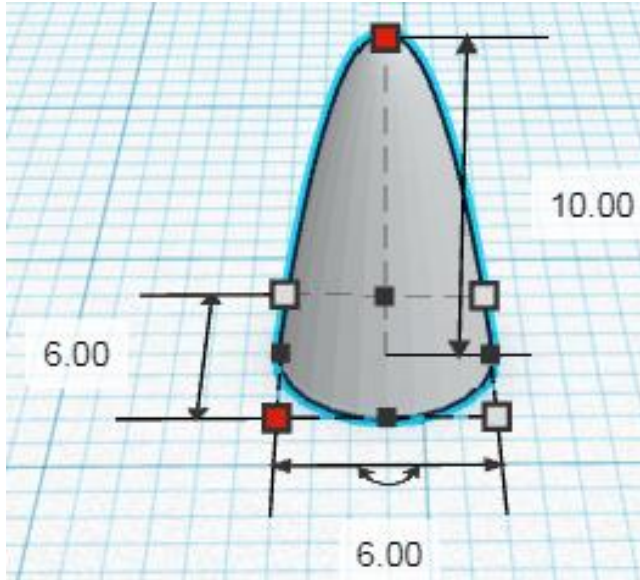

27mm
up (hold control)

1mm
left

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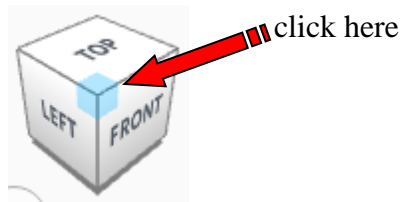
Beak:

Bring in a Paraboloid, located in Basic Shapes on the left 8 shapes down.
From now on this will be called the **Beak**.

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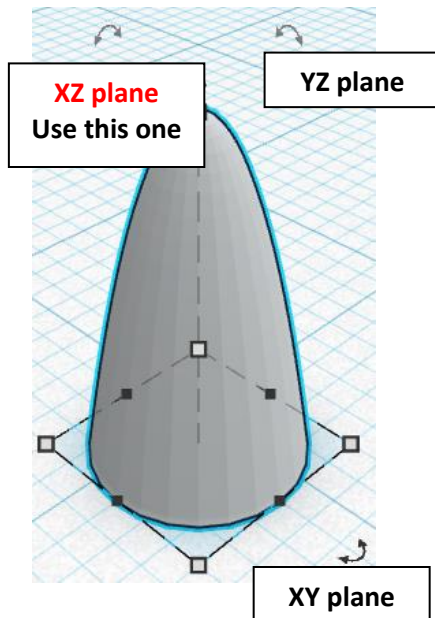6mm X direction,
6mm Y direction, and
10mm Z direction.

10.00

6.00

6.00

Go to TOP LEFT FRONT view for rotations   click here

Rotate the Beak counter-clockwise 45 degrees in XZ plane.

Before   After

XZ plane
Use this one

YZ plane

45°

XY plane

Align <u>Beak</u> and <u>Body</u>

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

Move <u>Beak</u>   (Must be in home view for this to work!)
move down in negative Z direction 2mm
and
move left in negative X direction 4mm

Hint: Select <u>Beak</u> and hold control down and push down arrow key 2 times. Then release control button and
push left arrow key 4 times.

Before   After

| 2mm |
| down |
| (hold control) |

| 4mm |
| left |

Group <u>Beak</u> and <u>Body</u>
From now on this will be called the **Body**.

Tail:

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

Change the dimensions to
16mm X direction,
16mm Y direction, and
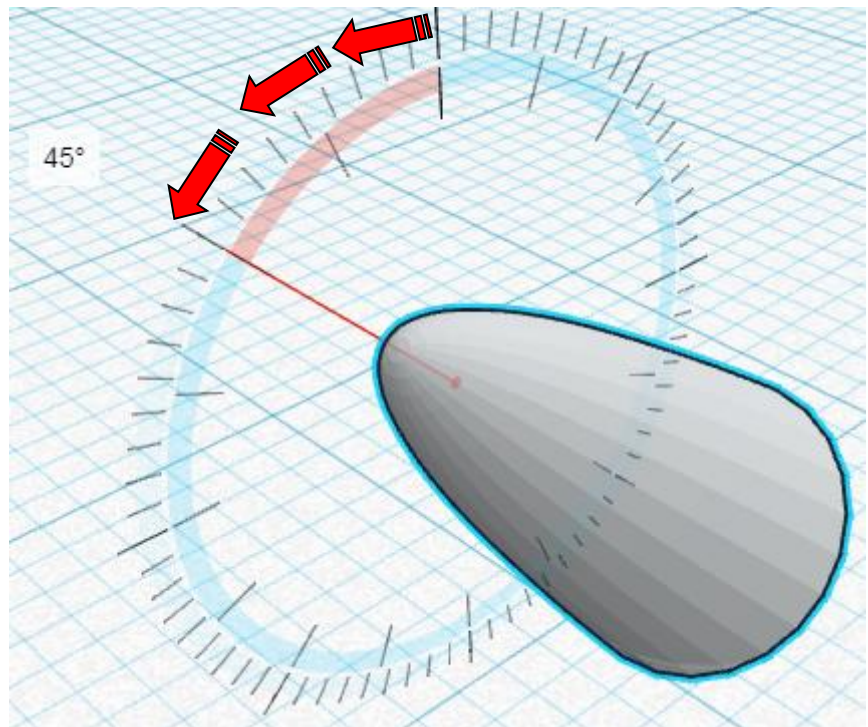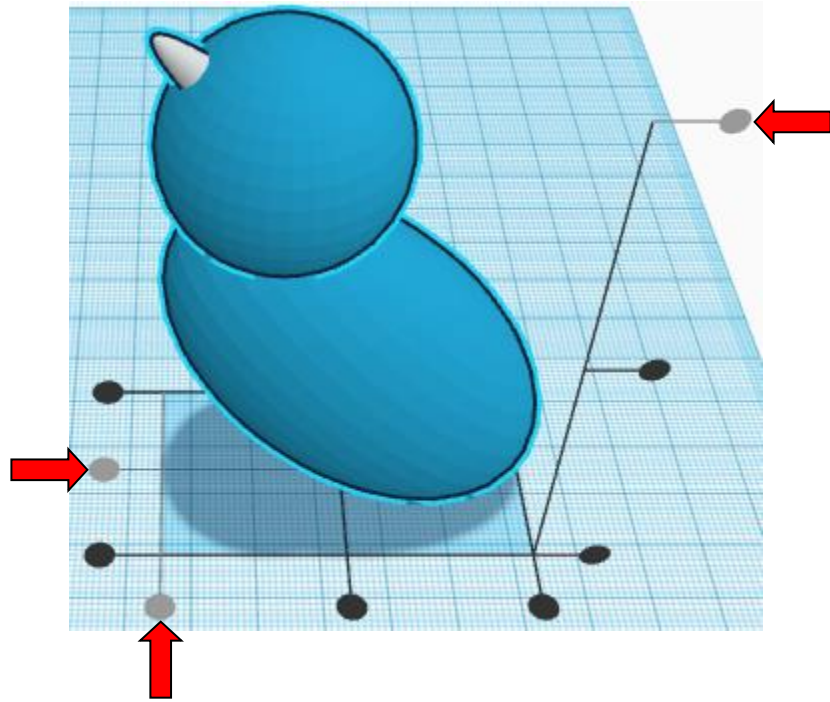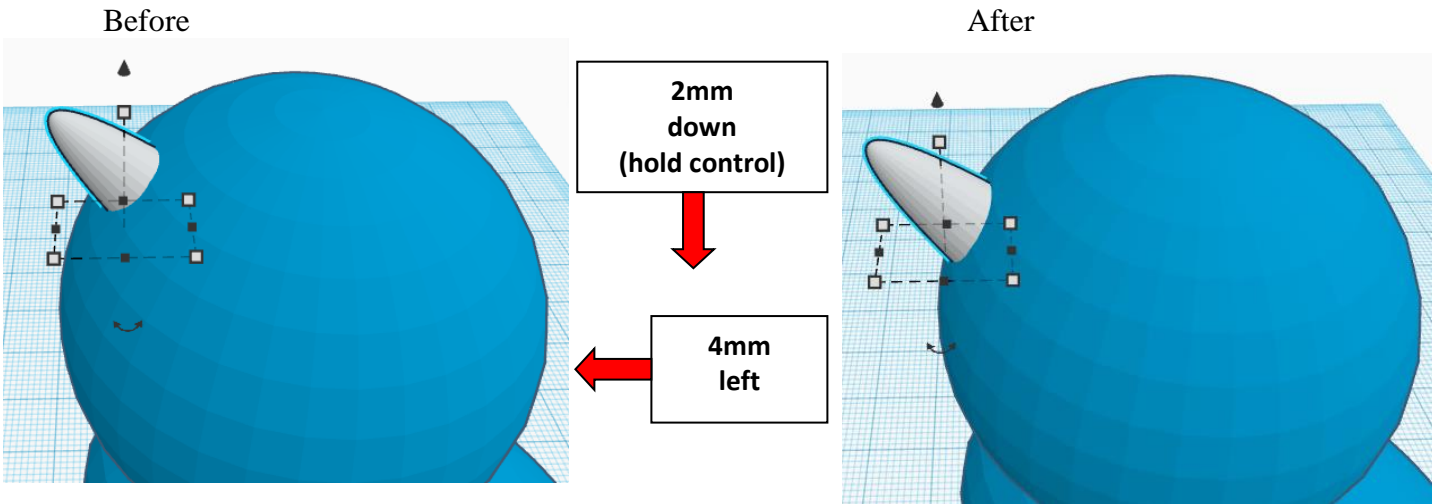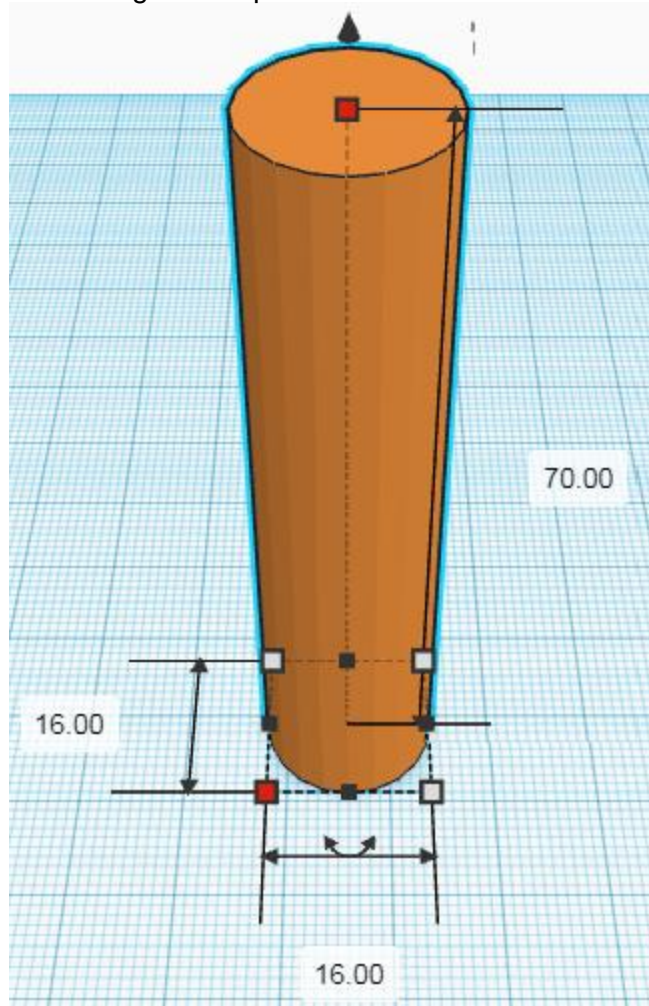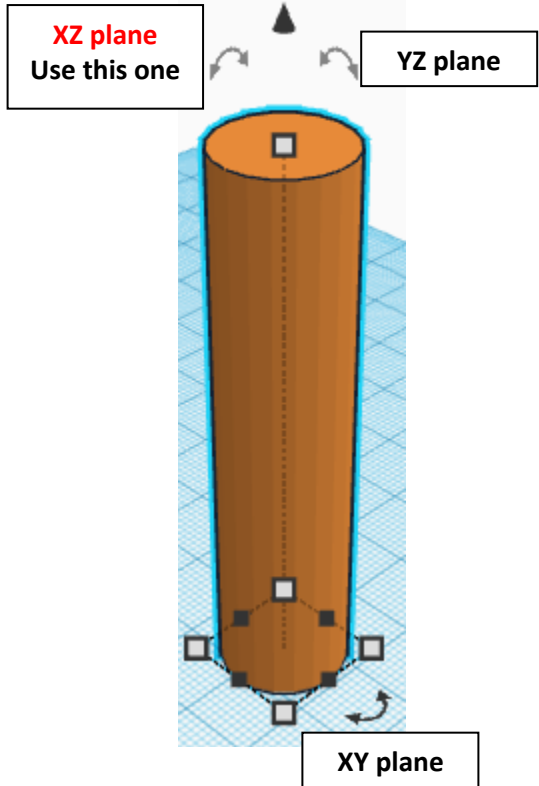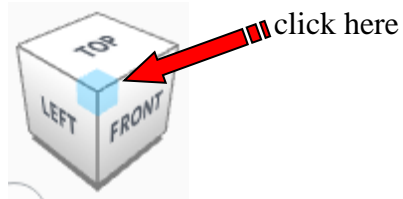70mm Z direction.
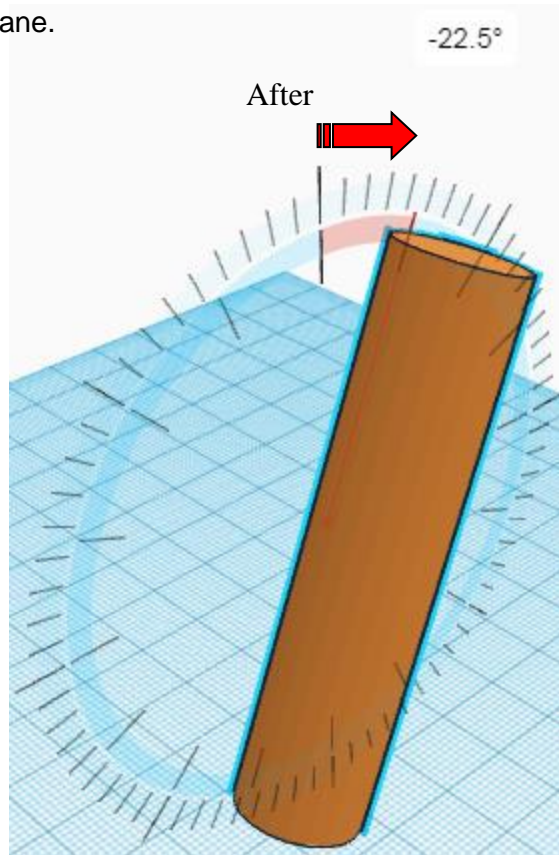
Go to TOP LEFT FRONT view for rotations

click here

Rotate the <u>Tail</u> clockwise 22.5 degrees in XZ plane.

Before

After

-22.5°

XZ plane
Use this one

YZ plane
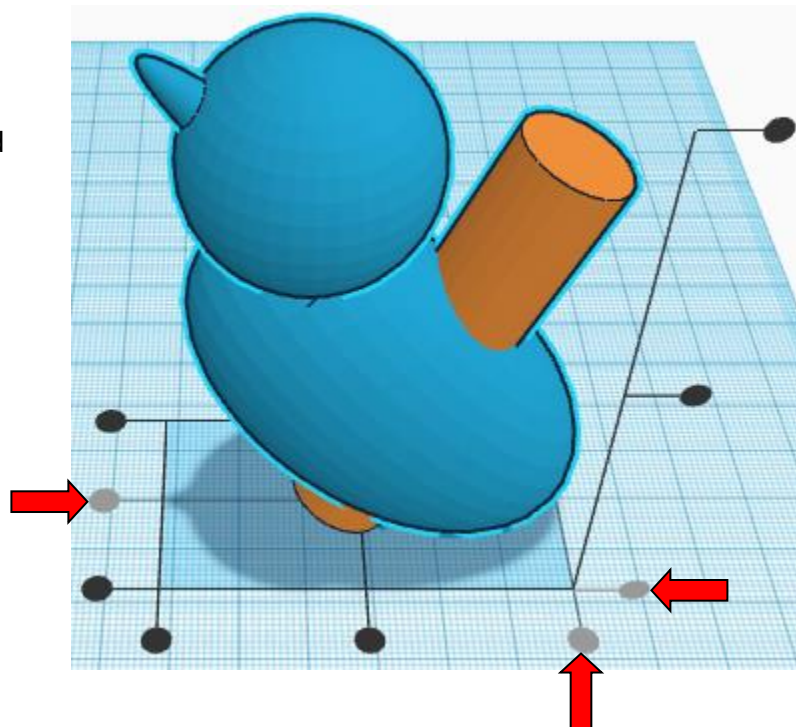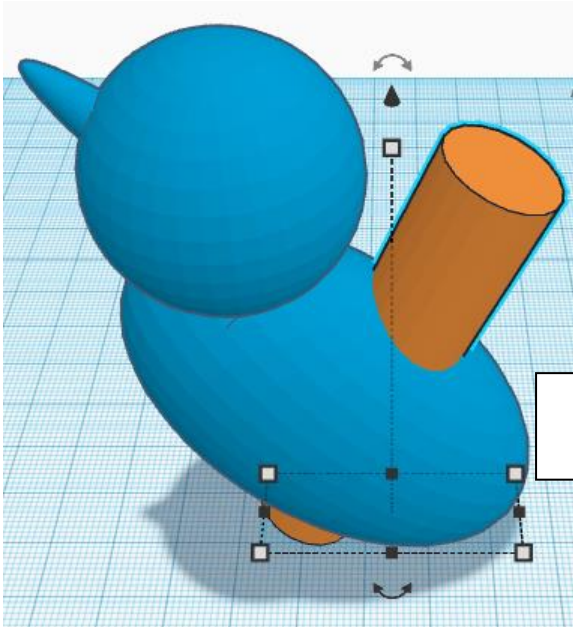
XY plane

Align <u>Tail</u> and <u>Body</u>

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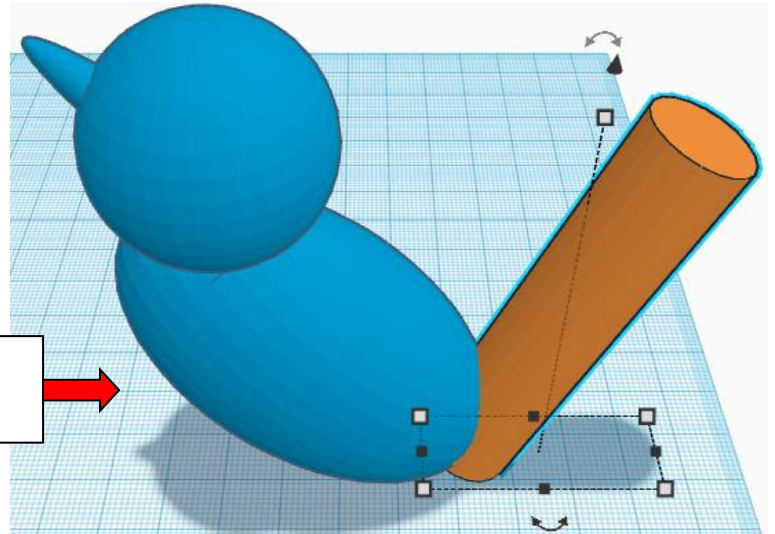centered of Y direction, and
bottom of Z direction.

Move Tail   (Must be in home view for this to work!)
move right in positive X direction 31mm

Hint: Select Tail and hold shift down and push right arrow key 3 times. Then release shift button and push right arrow key 1 time.

Before   After

31mm right

Group Tail and Body
From now on this will be called the **Bird**.

Congratulations, you are done with the outside of the bird.

Next we will create all the holes, group them together, and move them in place to be grouped with the bird to hollow out the inside of the bird.
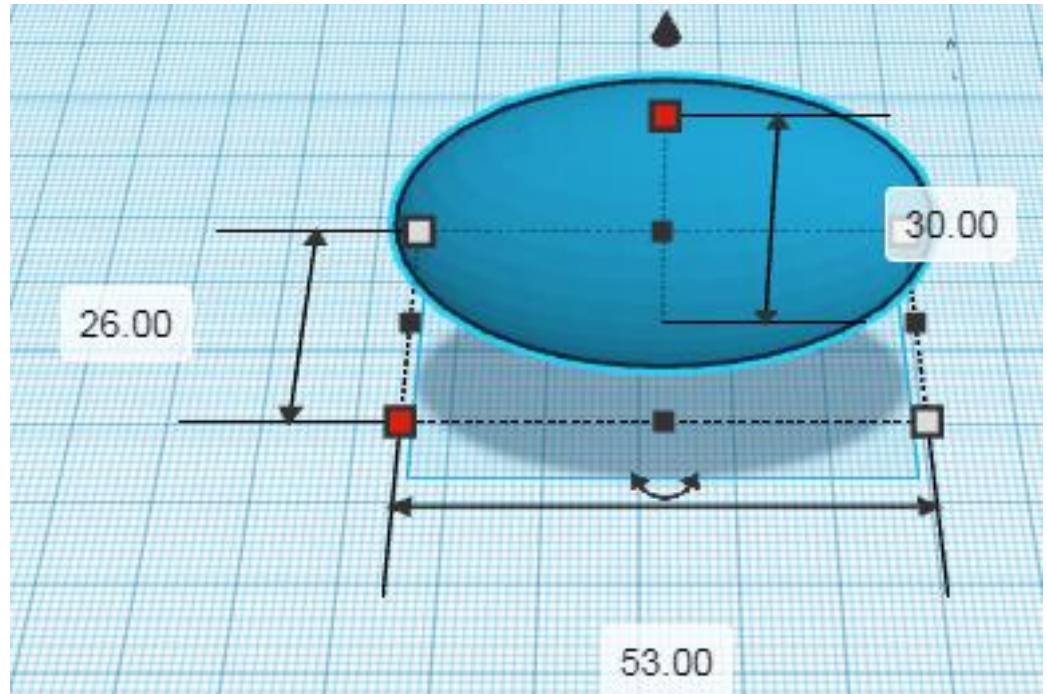
Set the bird off to the side for later use.
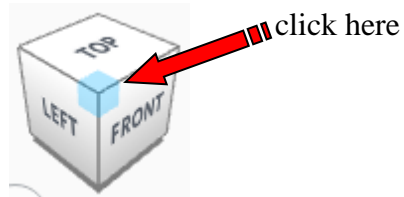
Inside the Bird:

Inside Body:

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

Change the dimensions to
53mm X direction,
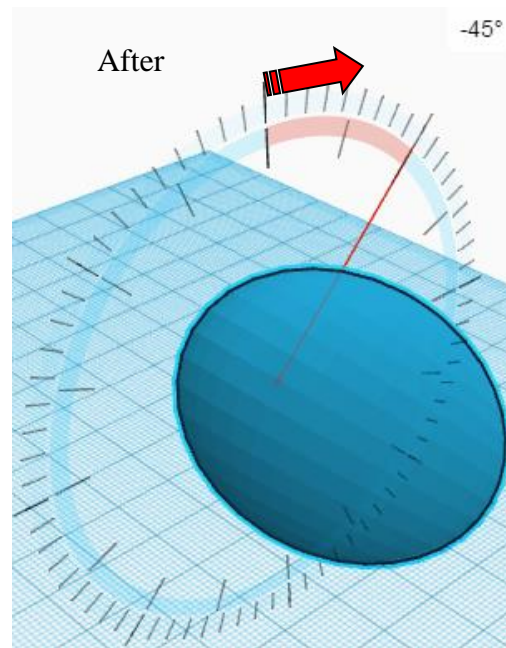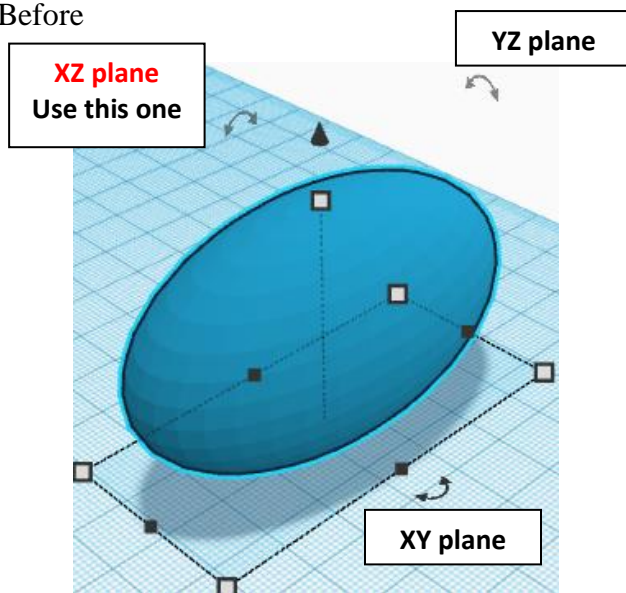26mm Y direction, and
30mm Z direction.

Go to TOP LEFT FRONT view for rotations   click here

Rotate the Inside Body clockwise 45 degrees in XZ plane.

Before

XZ plane
Use this one

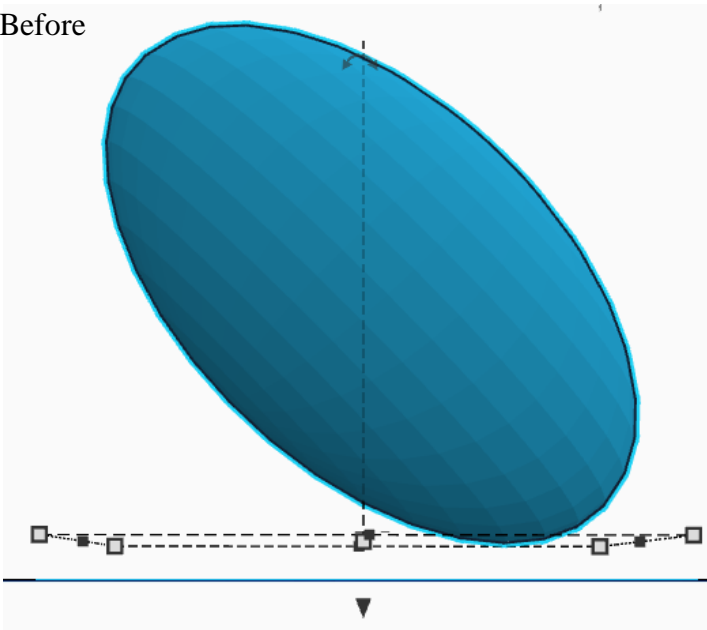YZ plane

XY plane

After
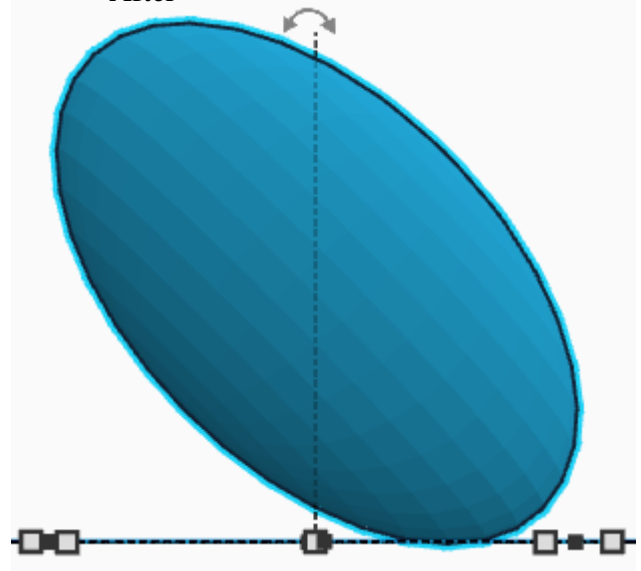
-45°

Set on Workplane:

Select the <u>Inside Body</u> and type "d" to set the body on the work plane.
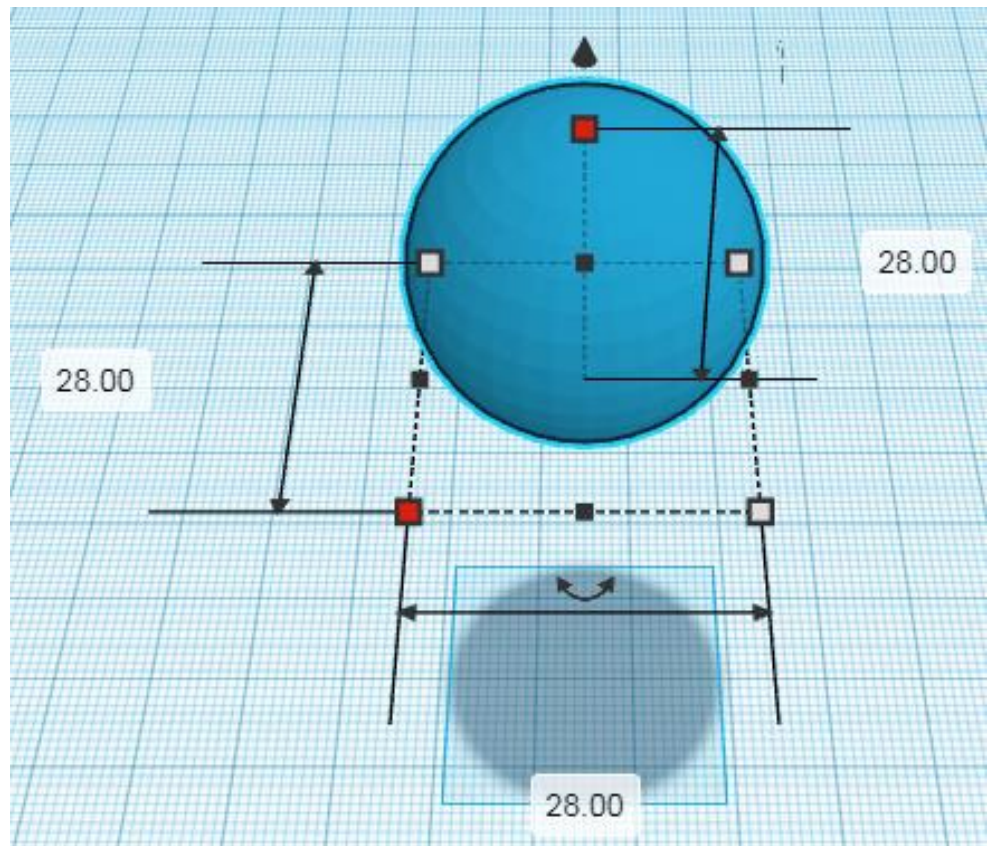
Before   After

Inside Head:

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

Change the dimensions to
28mm X direction,
28mm Y direction, and
28mm Z direction.

Before I align the Inside Head and Inside Body I am going to change the color on the Inside Head to red to better identify what part is the Inside Head and what part is the Inside Body.

Align Inside Head and Inside Body

left in X direction,
centered of Y direction, and
top of Z direction.
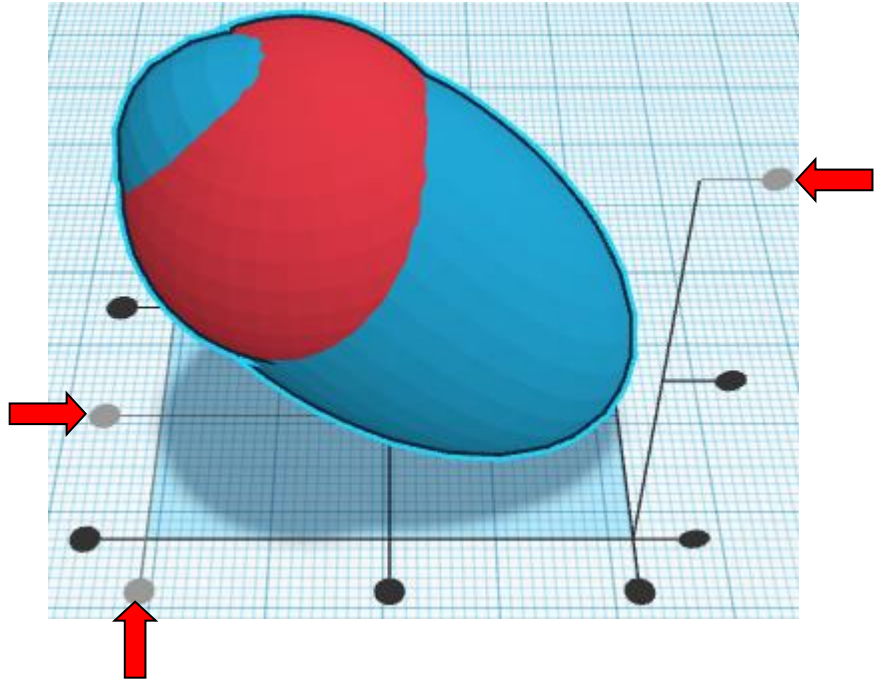
Move Inside Head   (Must be in home view for this to work!)
move up in positive Z direction 29mm
and
move left in negative X direction 4mm

Hint: Select Inside Head and hold control down and push up arrow key 29 times. Then release control button
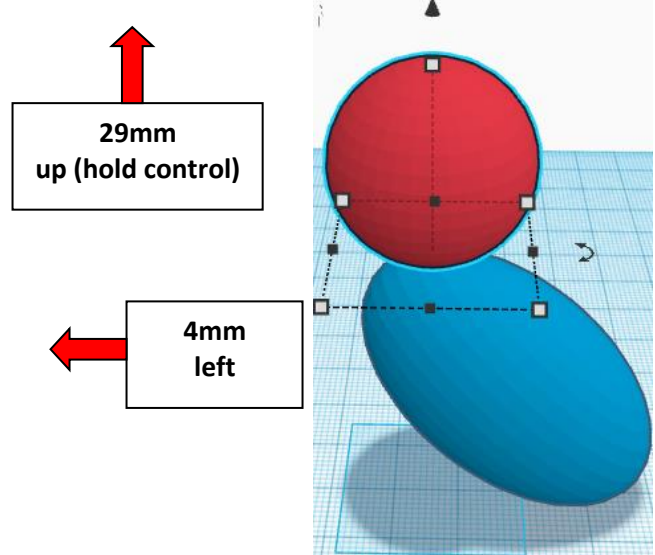and   push left 4 times.
    or
    Hold down shift and control and push up arrow 2 times and release shift but still hold control down
    and push up arrow 9 times.
    Then release the control button and push left arrow 4 times.

Before   After

29mm
up (hold control)

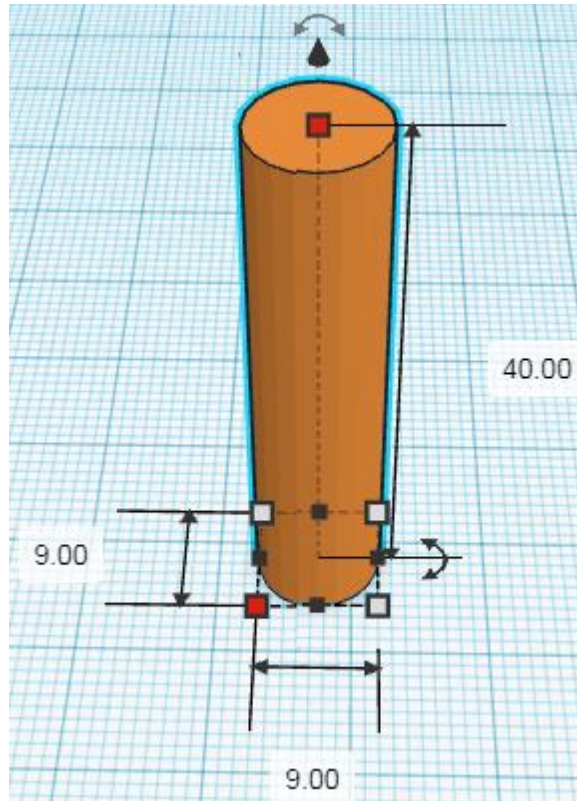4mm
left
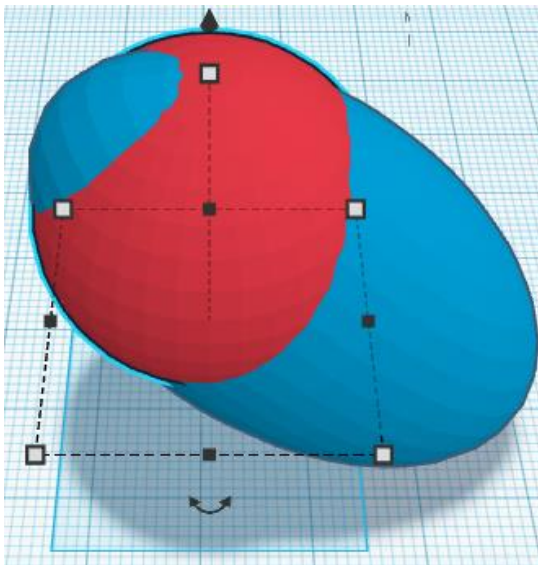
Group Inside Head and Inside Body

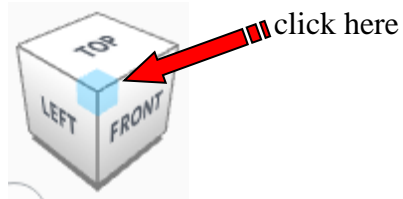From now on this will be called the **Inside Body**.

Eyes:

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

Change the dimensions to
9mm X direction,
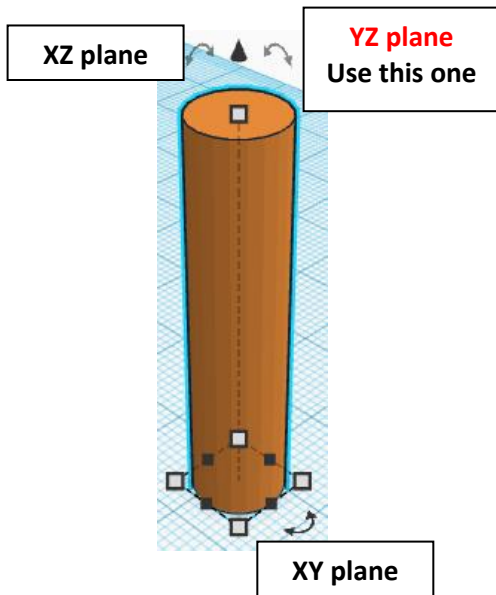9mm Y direction, and
40mm Z direction.
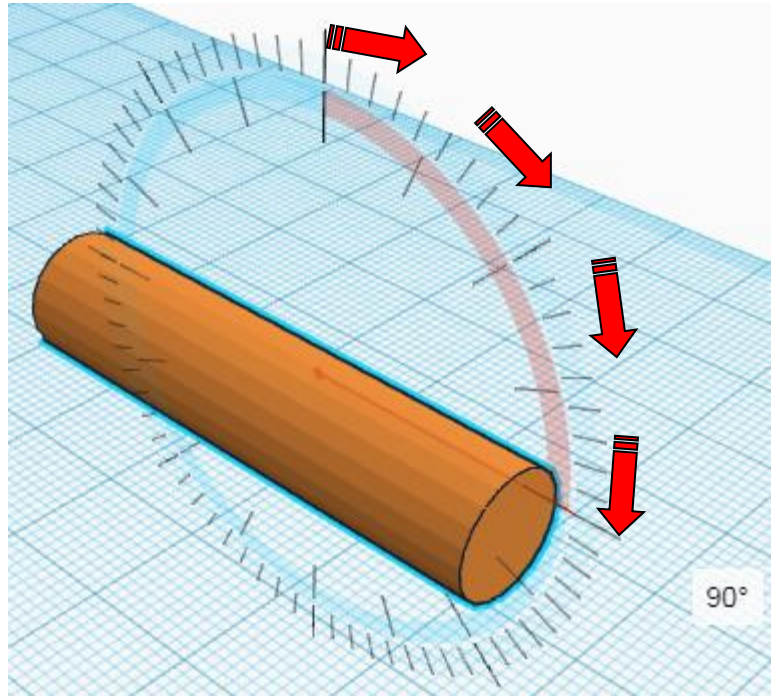
Go to TOP LEFT FRONT view for rotations   click here

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

Before   After

| XZ plane | | YZ plane Use this one |

XY plane

90°

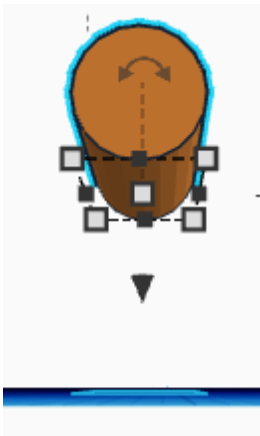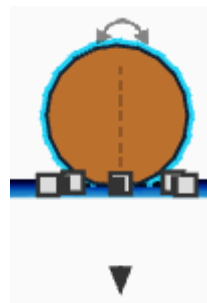**Set on Workplane:**

Select the <u>Eyes</u> and type "d" to set the body on the work plane.

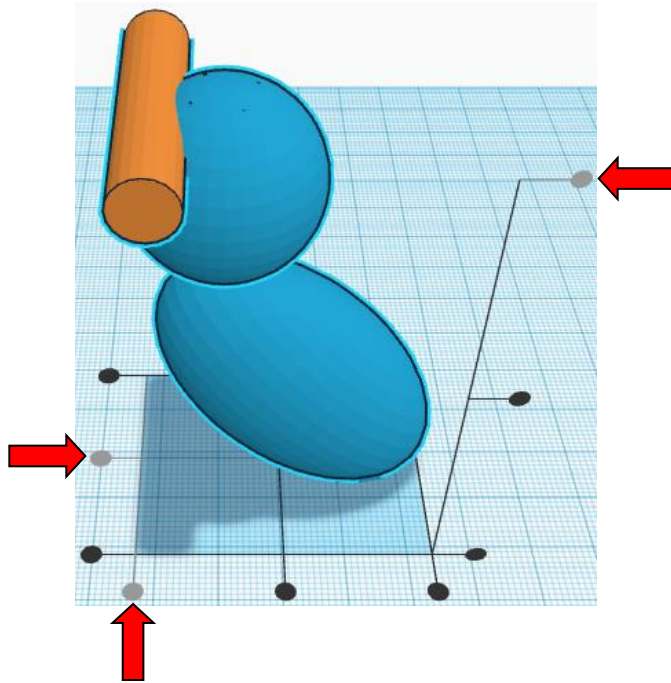Before   After
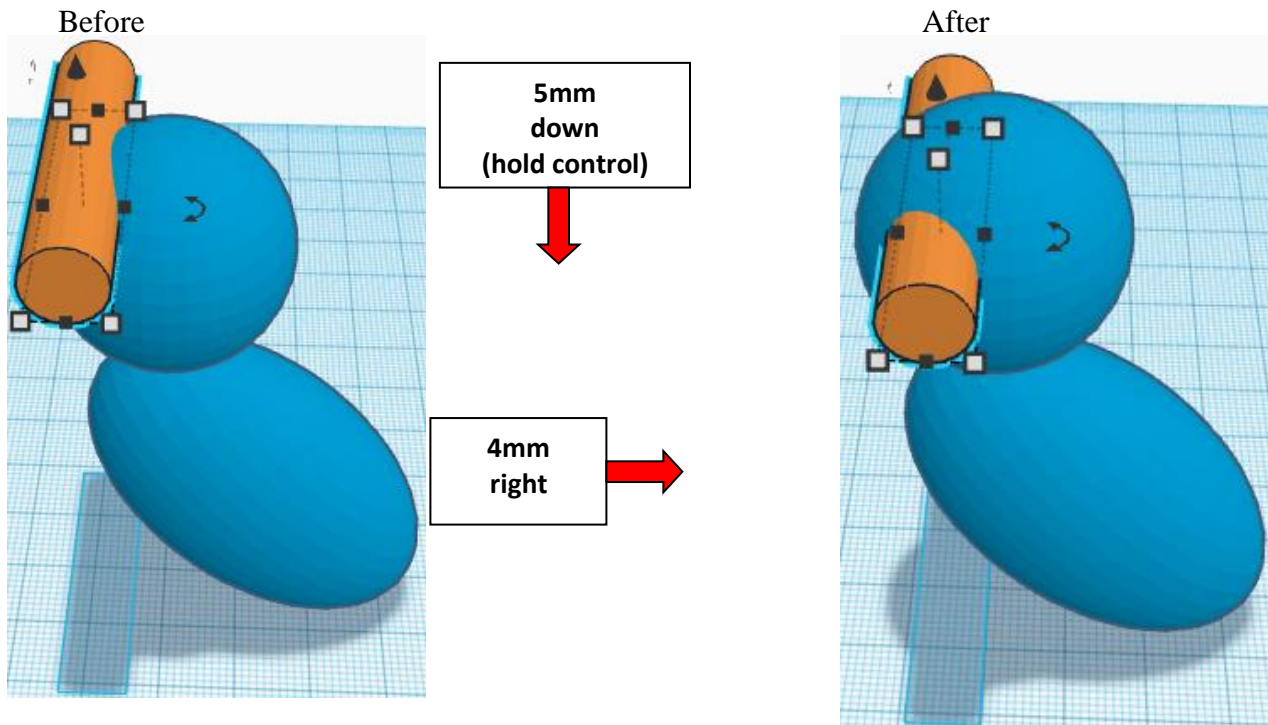
Align Eyes and Inside Body

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

Move Eyes   (Must be in home view for this to work!)
move down in negative Z direction 5mm
and
move right in positive X direction 4mm

Hint: Select Eyes and hold control down and push down arrow key 5 times. Then release control button and
push right 4 times.

Before   After
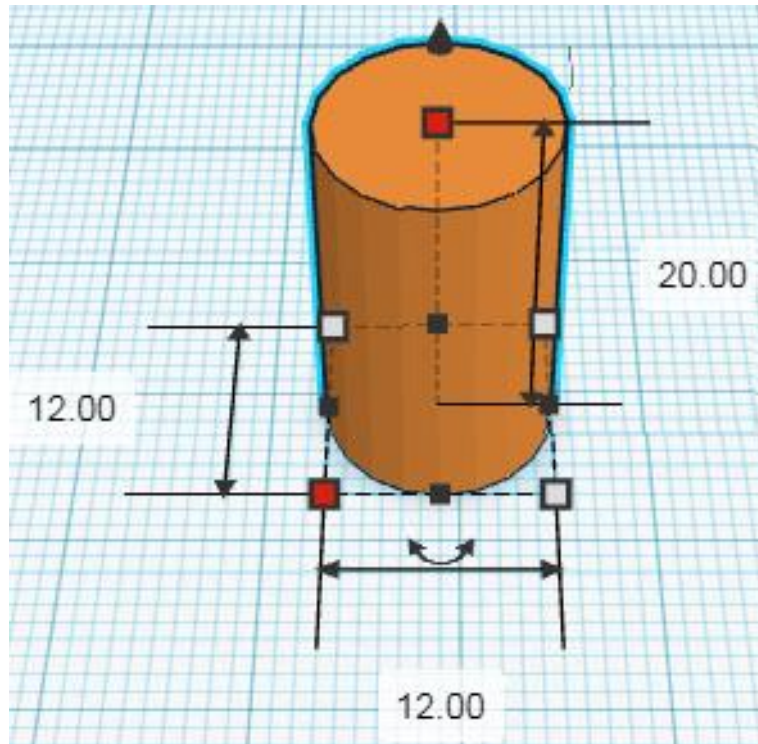

5mm
down
(hold control)

4mm
right

Group Eyes and Inside Body
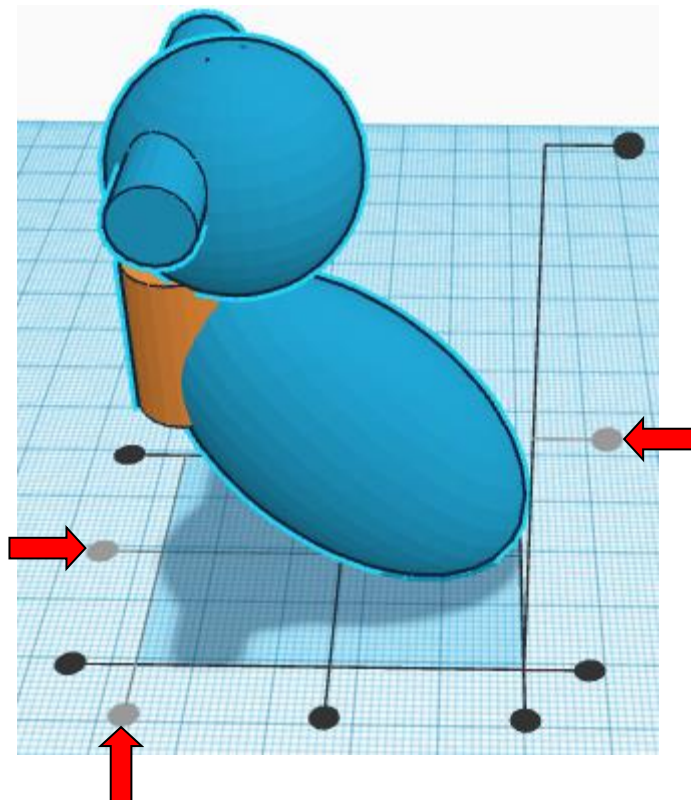From now on this will be called the **Inside Body**.

Neck:

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

Change the dimensions to
12mm X direction,
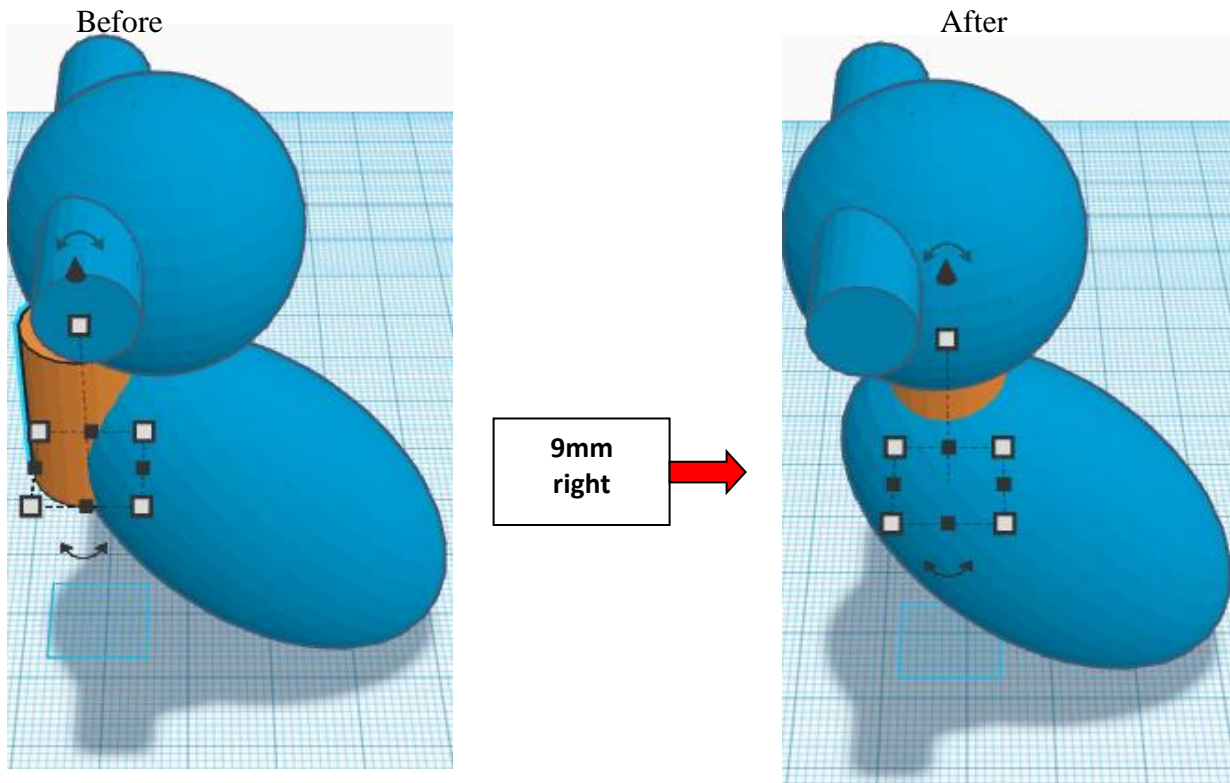12mm Y direction, and
20mm Z direction.

Align Neck and Inside Body

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

Move Neck   (Must be in home view for this to work!)
move right in positive X direction 9mm

Hint: Select Neck and push right arrow key 9 times.

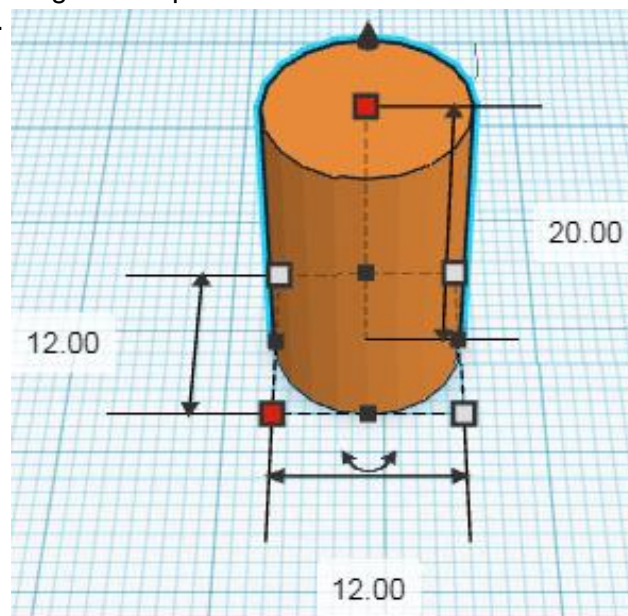Before   After

9mm
right

Group Neck and Inside Body
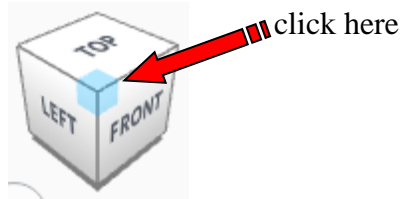From now on this will be called the **Inside Body**.

Tail Support:

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

Change the dimensions to
12mm X direction,
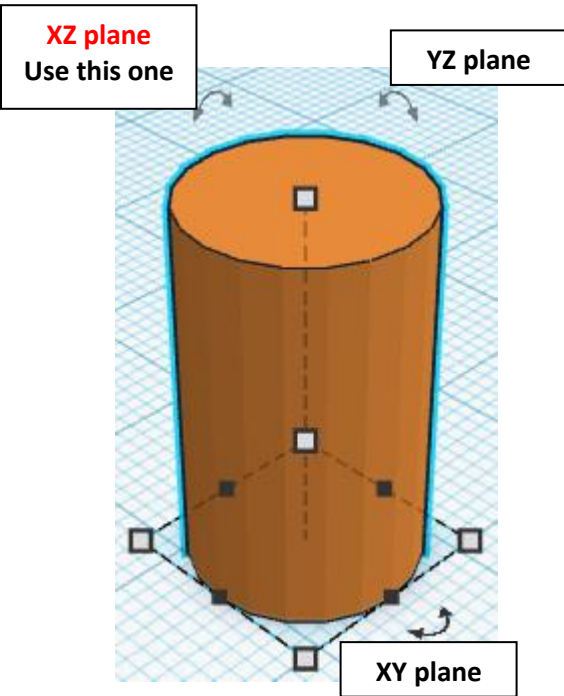12mm Y direction, and
20mm Z direction.

20.00

12.00
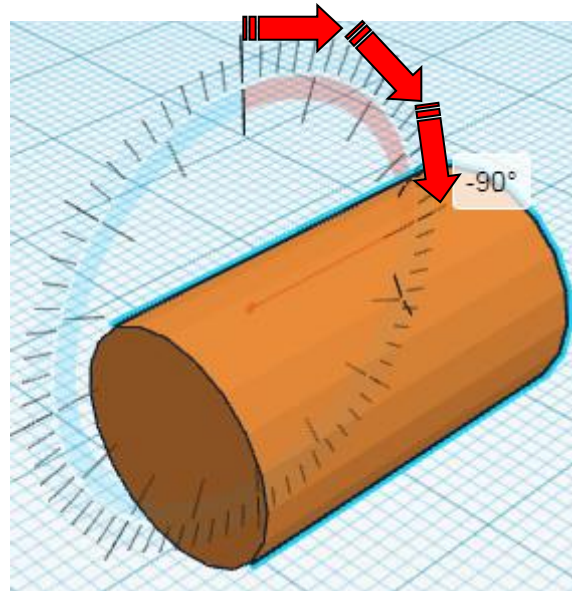
12.00

Go to TOP LEFT FRONT view for rotations   click here

Rotate the Tail Support clockwise 90 degrees in XZ plane.

Before   After

| XZ plane |
| Use this one |

YZ plane

-90°

XY plane

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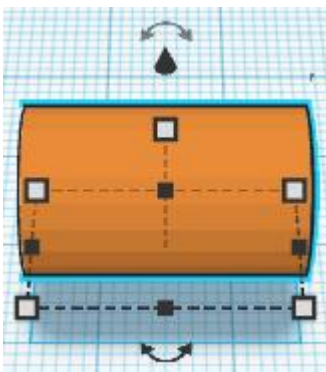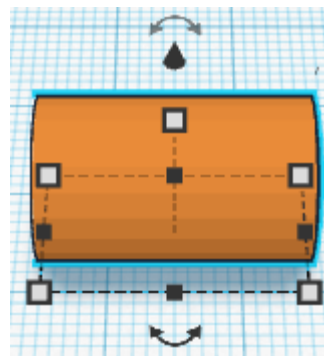
Select the Tail Support and type "d" to set the body on the work plane.

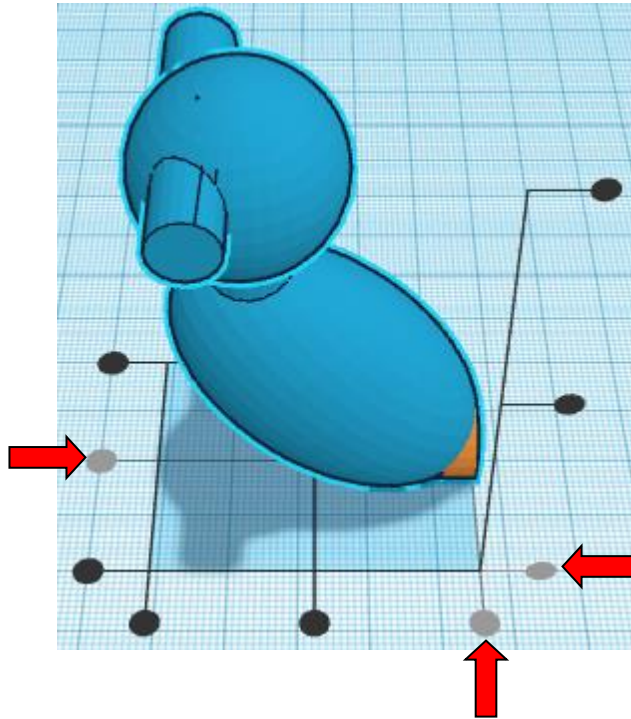Before   After

Align Tail Support and Inside Body

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

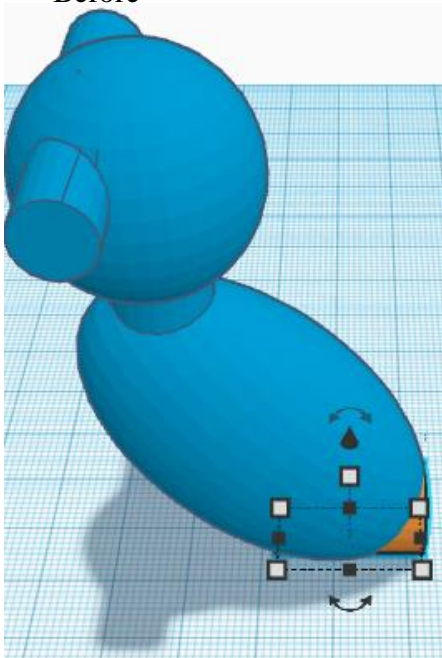**Move** Tail Support   (Must be in home view for this to work!)
move right in positive X direction 13mm
and
move up in positive Z direction 1mm

Hint: Select Tail Support and hold shift down and push right arrow key 1 times. Then release shift button
and push right 3 times. Then hold control down and push up arrow 1 time.
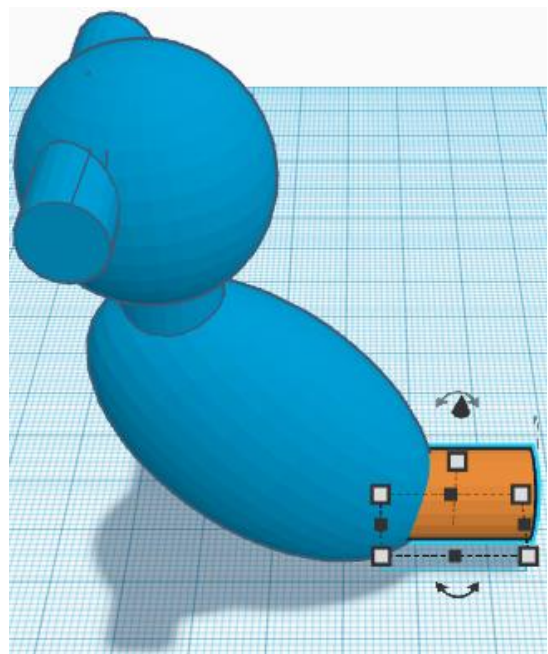
Before   After

13mm
right

1mm
up
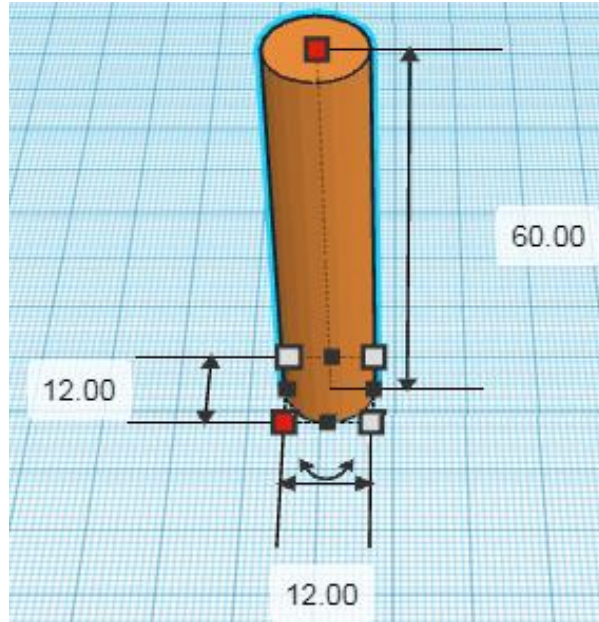(hold control)

Group Tail Support and Inside Body
From now on this will be called the **Inside Body**.

Inside Tail:

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

Change the dimensions to
12mm X direction,
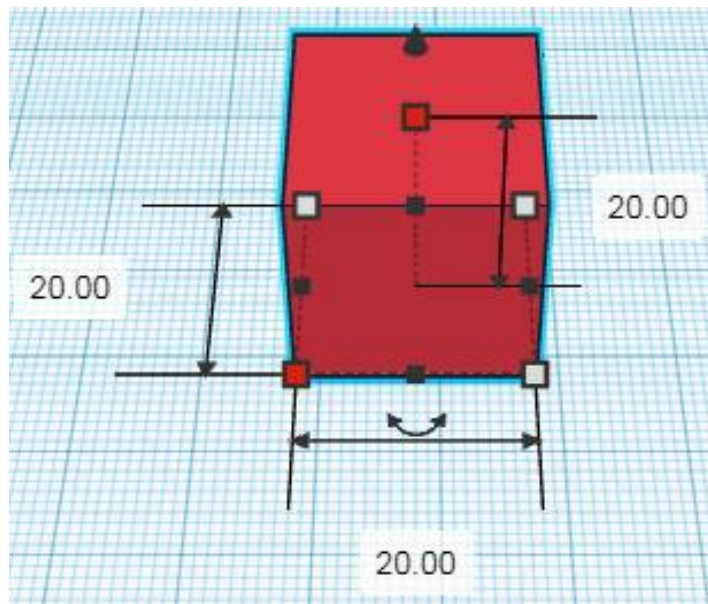12mm Y direction, and
60mm Z direction.

Tail Cutout:

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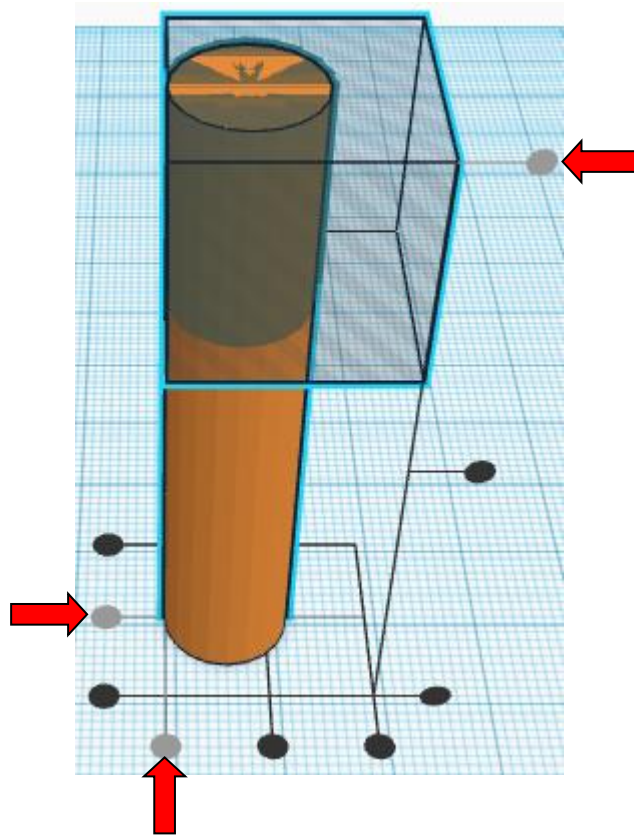From now on this will be called the **Tail Cutout**.

Leave the dimensions as
20mm X direction,
20mm Y direction, and
20mm Z direction.

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

Align Tail Cutout and Inside Tail

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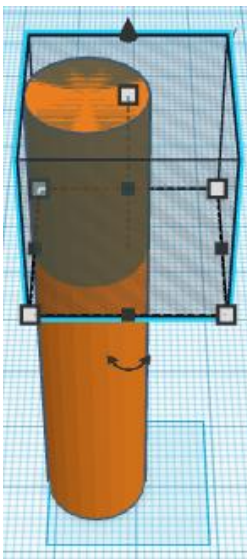centered of Y direction, and
top of Z direction.

Move Tail Cutout   (Must be in home view for this to work!)
move right in positive X direction 2mm
and
move up in positive Z direction 5mm

Hint: Select Tail Cutout and push right arrow key 2 times. Then hold control down and push up arrow 5 times.

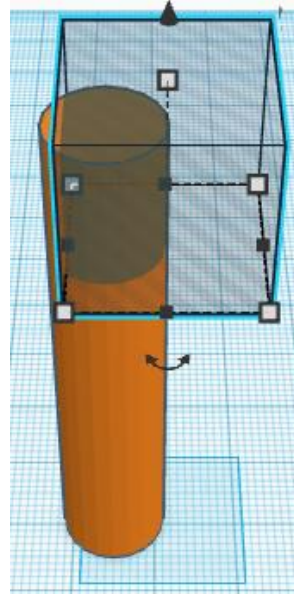Before   After

2mm
**right**

5mm
up
(hold control)

Group Tail Cutout and Inside Tail
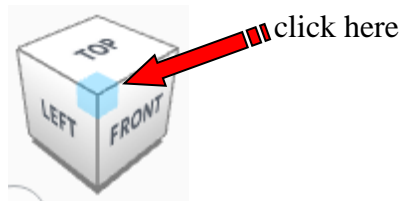From now on this will be called the **Inside Tail**.

Air hole:

Bring in a Wedge, located in Basic Shapes on the left 6 shapes down.
From now on this will be called the **Air hole**.

Leave the dimensions as
20mm X direction,
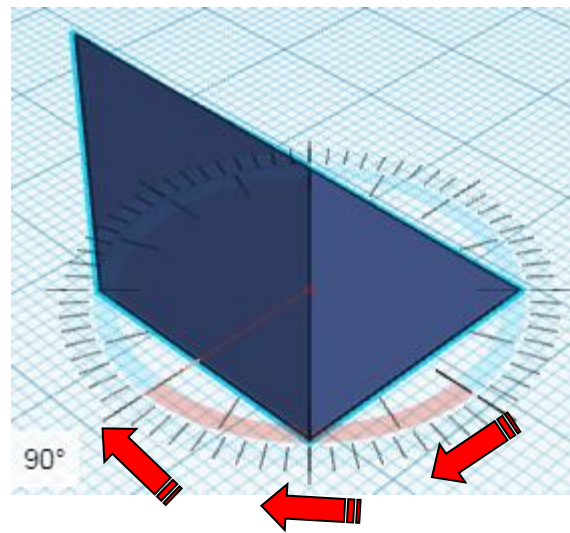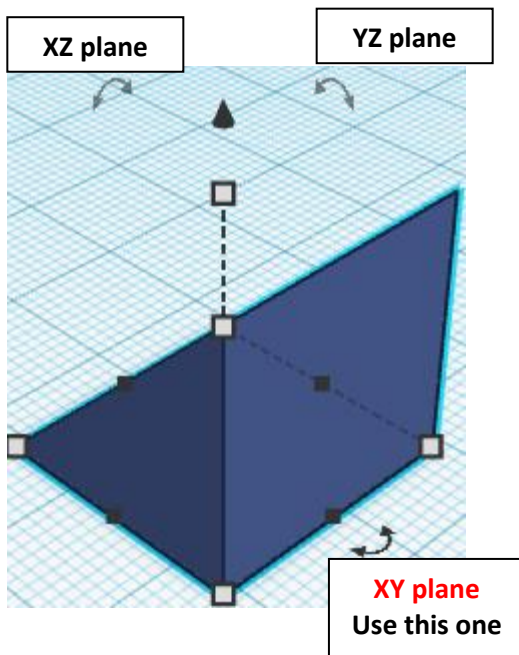20mm Y direction, and
20mm Z direction.

20.00

20.00

20.00

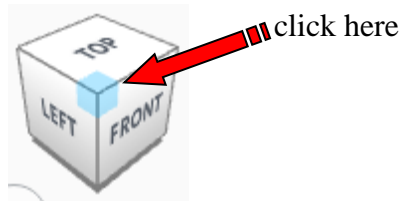Go to TOP LEFT FRONT view for rotations

TOP
LEFT FRONT

click here
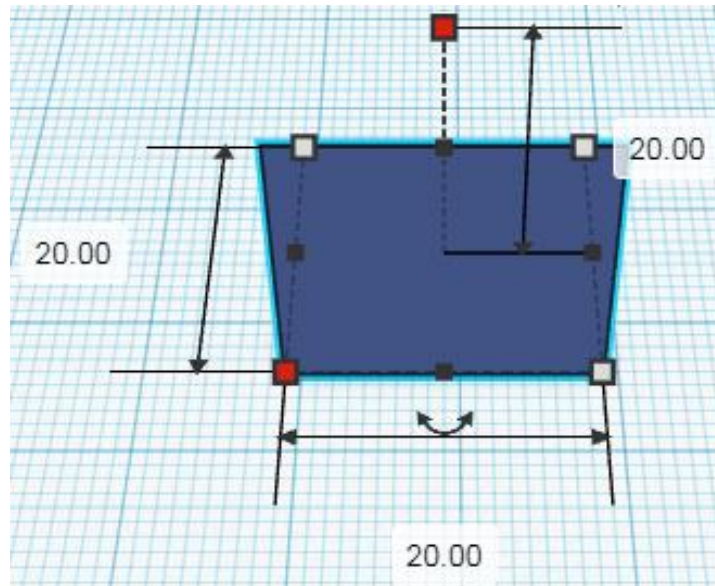
Rotate the Air Hole clockwise 90 degrees in XY plane.

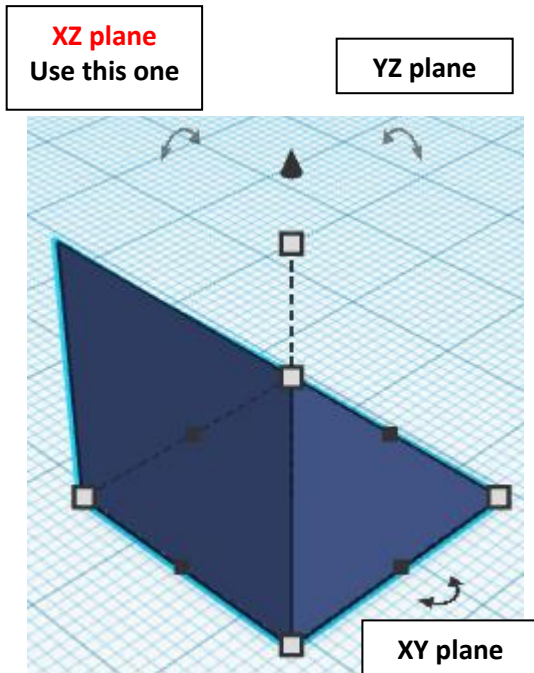Before   After

XZ plane

YZ plane

90°

XY plane
Use this one

Go to TOP LEFT FRONT view for rotations   ◨◨click here
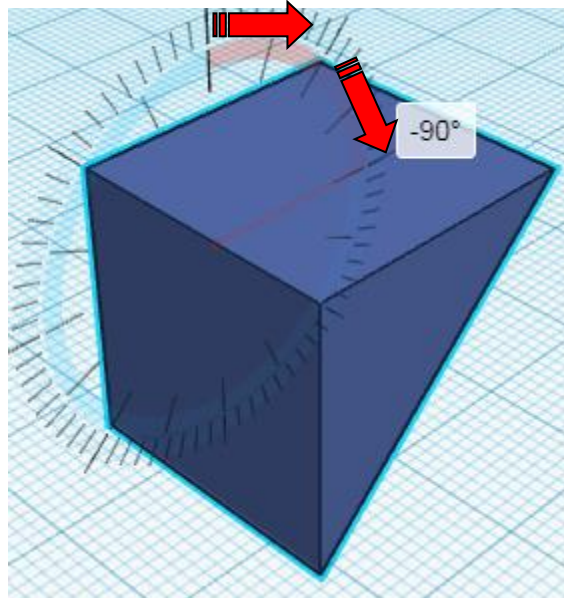
Another Rotate the Air Hole clockwise 90 degrees in XZ plane.

Before   After
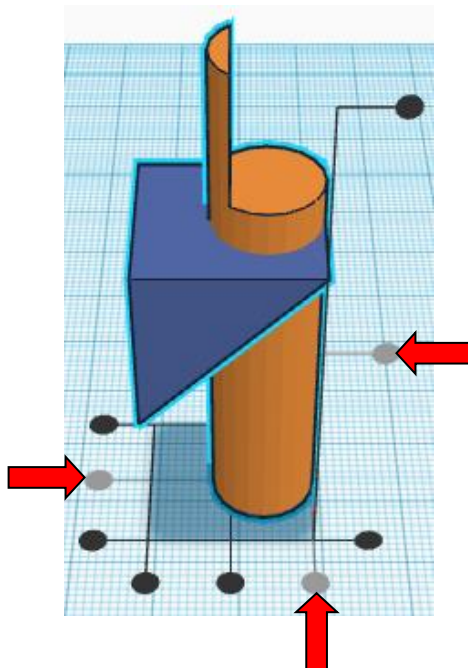

XZ plane
Use this one
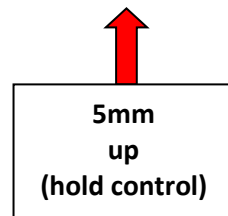
YZ plane

XY plane

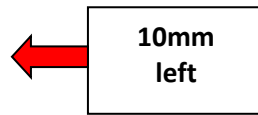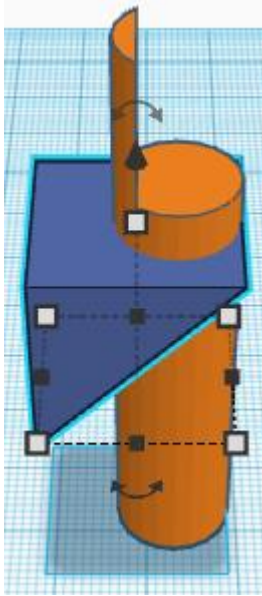**Align** Air Hole and Inside Tail

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

Move Air Hole   (Must be in home view for this to work!)
move left in negative X direction 10mm
and
move up in positive Z direction 5mm

Hint: Select Air Hole and hold shift and push left arrow key 1 time. Then hold control down and push up arrow 5 times.

Before   After

10mm left

5mm up (hold control)

Group Air Hole and Inside Tail
From now on this will be called the **Inside Tail**.

Go to TOP LEFT FRONT view for rotations click here

Rotate the <u>Inside Tail</u> clockwise 22.5 degrees in XZ plane.

Before   After

Align <u>Inside Body</u> and <u>Inside Tail</u>

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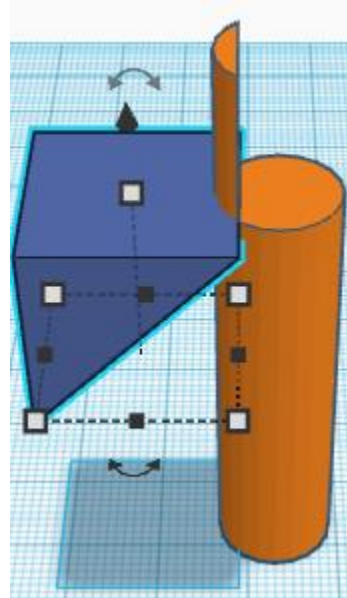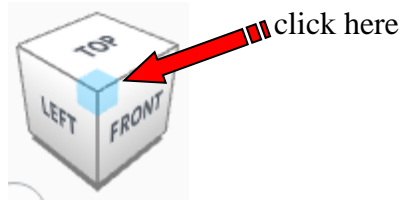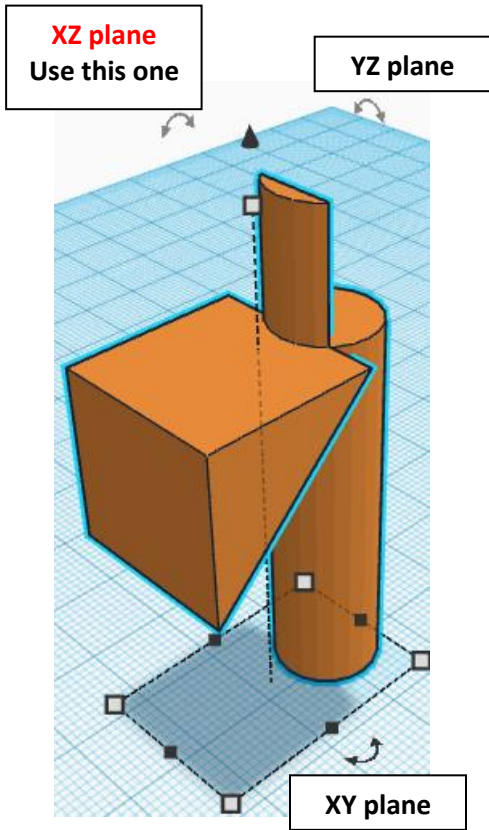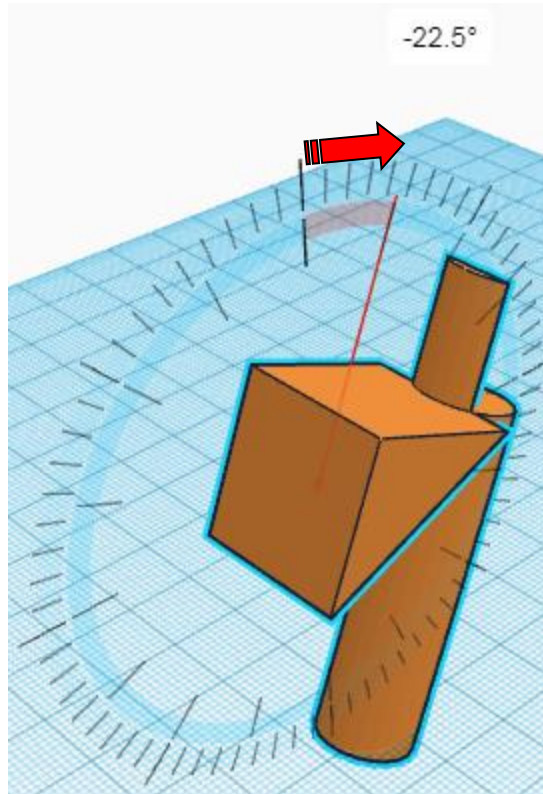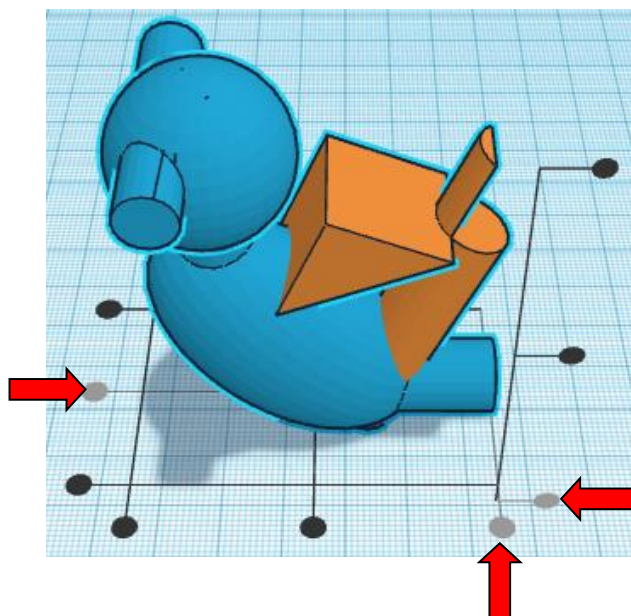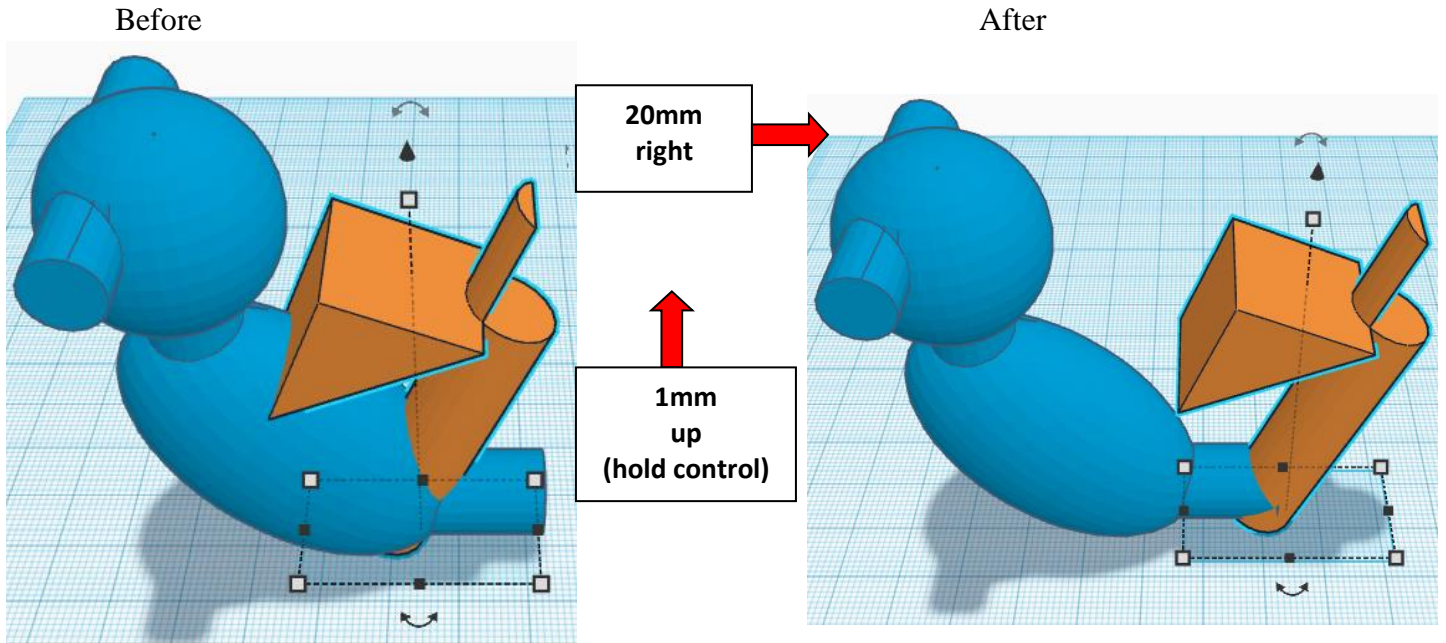centered of Y direction, and
bottom of Z direction.

Move Inside Tail   (Must be in home view for this to work!)
move right in positive X direction 20mm
and
move up in positive Z direction 1mm

Hint: Select Inside Tail and hold shift and push right arrow key 2 times.
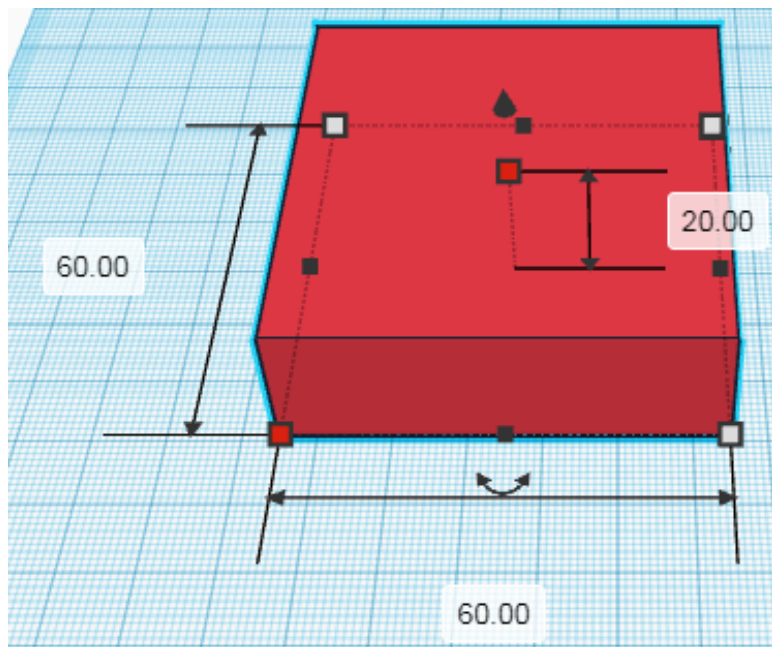   Then hold control down and push up arrow 1 time.

Before   After

20mm
right

1mm
up
(hold control)

Group Inside Body and Inside Tail
From now on this will be called the **Inside Body**.

Flat Bottom:

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

Leave the dimensions as
60mm X direction,
60mm Y direction, and
20mm Z direction.

20.00

60.00

60.00

Align Inside Body and Flat Bottom

centered in X direction,
centered of Y direction, and
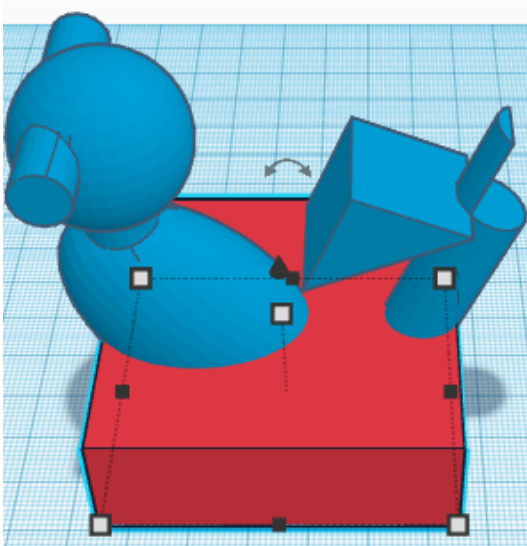bottom of Z direction.
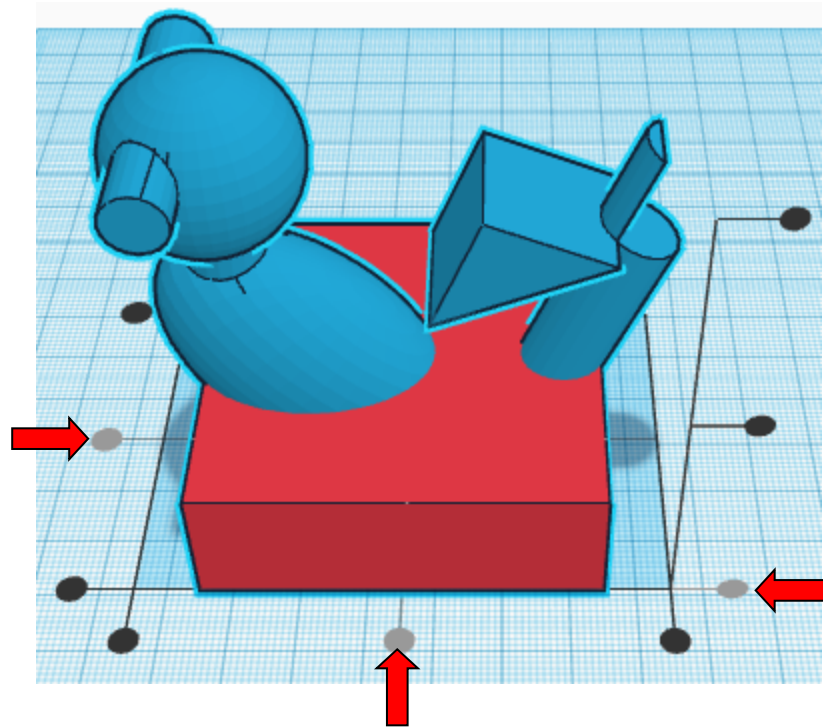
Move Flat Bottom   (Must be in home view for this to work!)
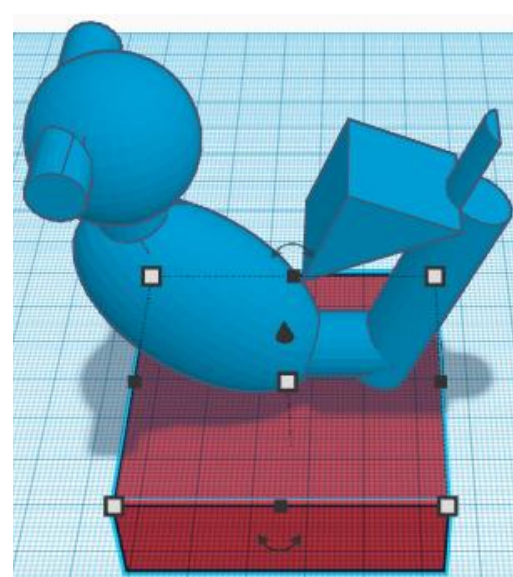move down in negative Z direction 22mm

Hint: Select Flat Bottom and hold shift down and hold control down and push down arrow 2 times.
          Then release the shift button but continue holding the control button and push down 2 times.

Before   After

22mm
down
(hold control)

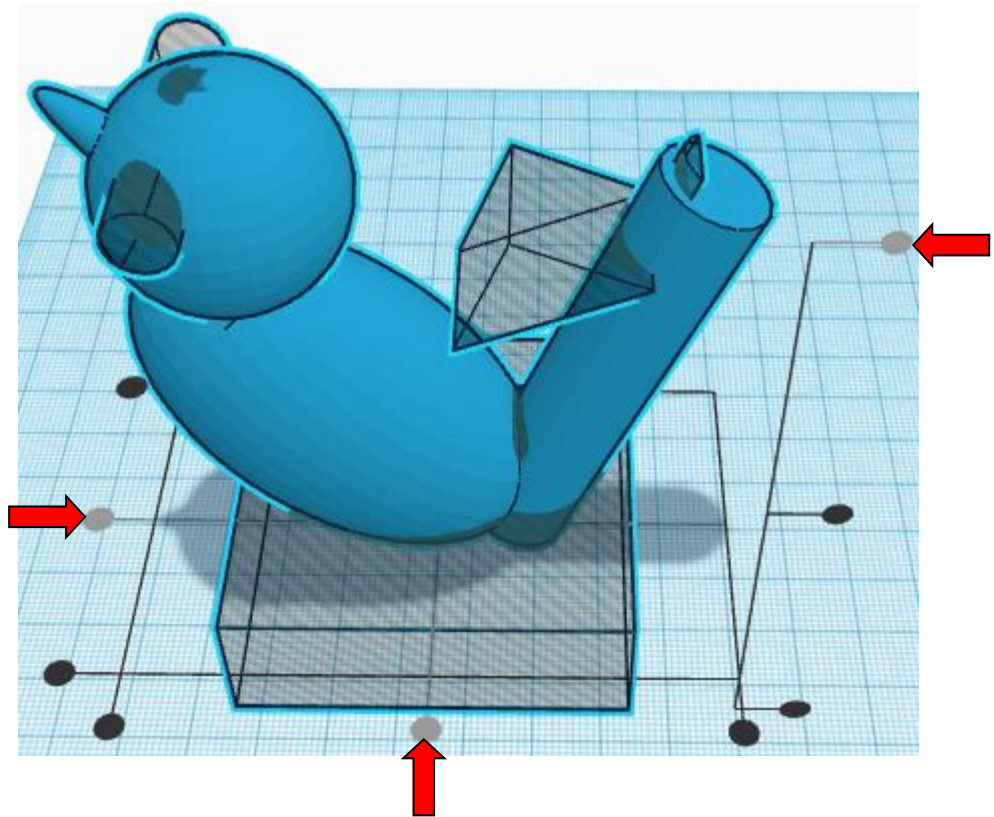**Group** Inside Body and Flat Bottom
From now on this will be called the **Inside Body**.

Time to put our bird together with the outside and inside parts!

First we need to change the inside to a **Hole**.

Change Inside Body to **Hole** by selecting Inside Body and typing "h".

Align Inside Body and Bird

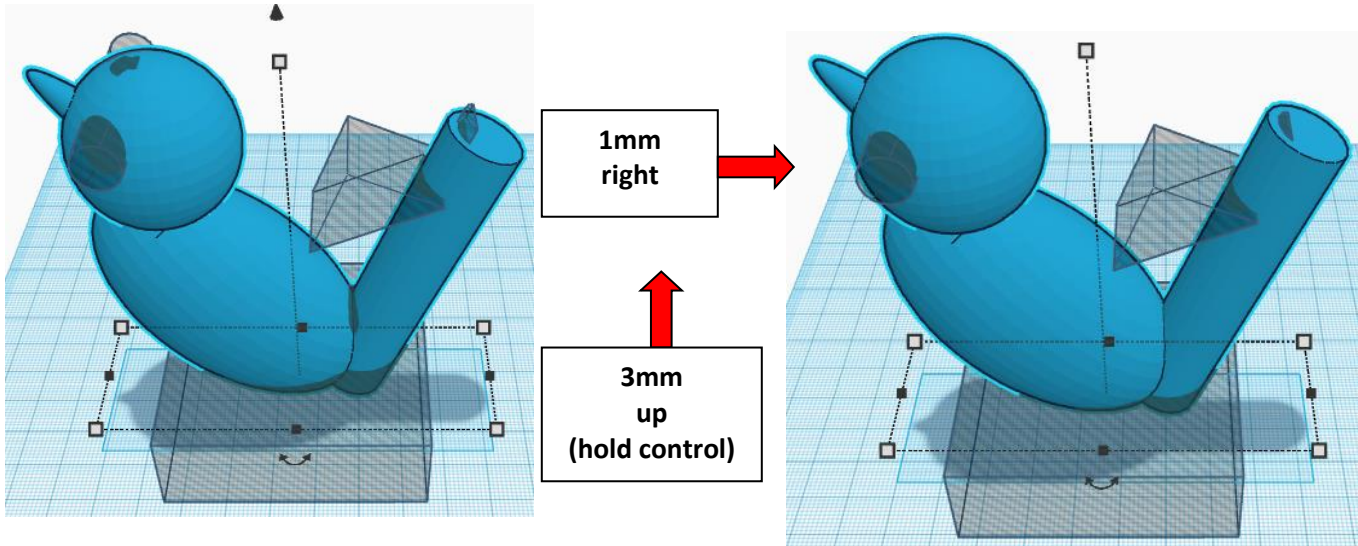centered in X direction, centered of Y direction, and top of Z direction.

Move Bird   (Must be in home view for this to work!)
move right in positive X direction 1mm
and
move up in positive Z direction 3mm

Hint: Select Bird and push right arrow key 1 time. Then hold control down and push up arrow 3 times.

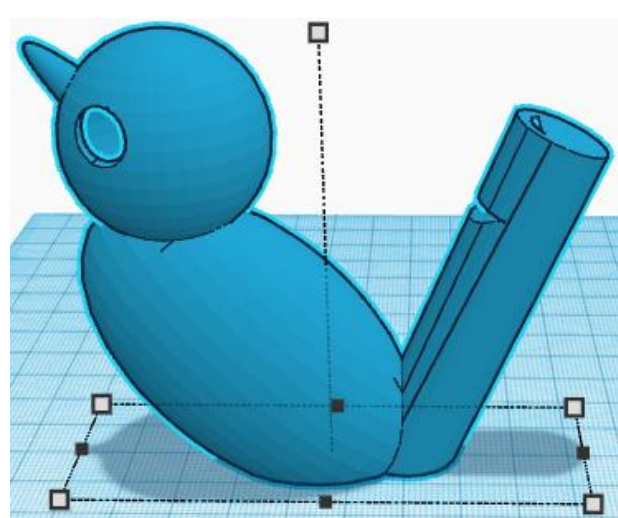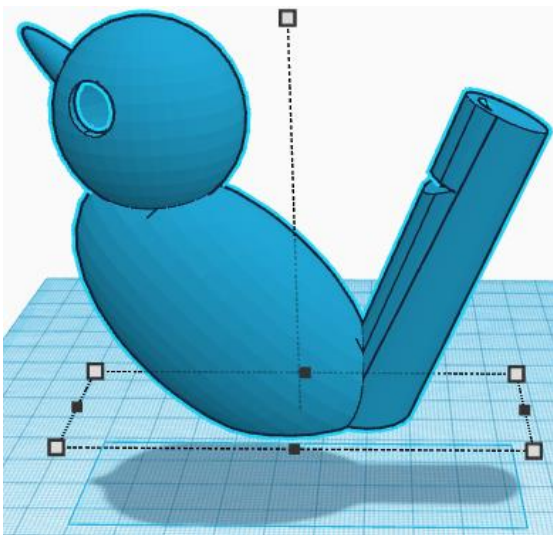Before   After

1mm
right

3mm
up
(hold control)

Group Inside Body and Bird
From now on this will be called the **Bird**.

Set on Workplane:

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

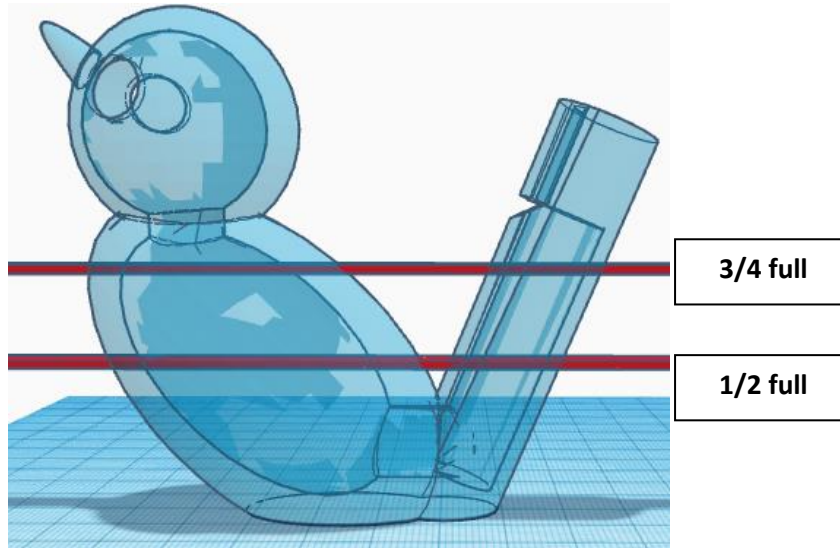Before   After

You are done and ready to print.

After printing let bird cool completely before adding water .

Add water through the eye till bird is between about 1/2 full to 3/4 full of water.

Blow through tail to get wobbling bird whistle.