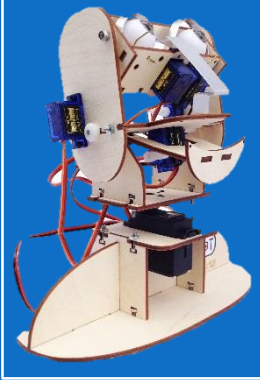
OHBOT

make program learn

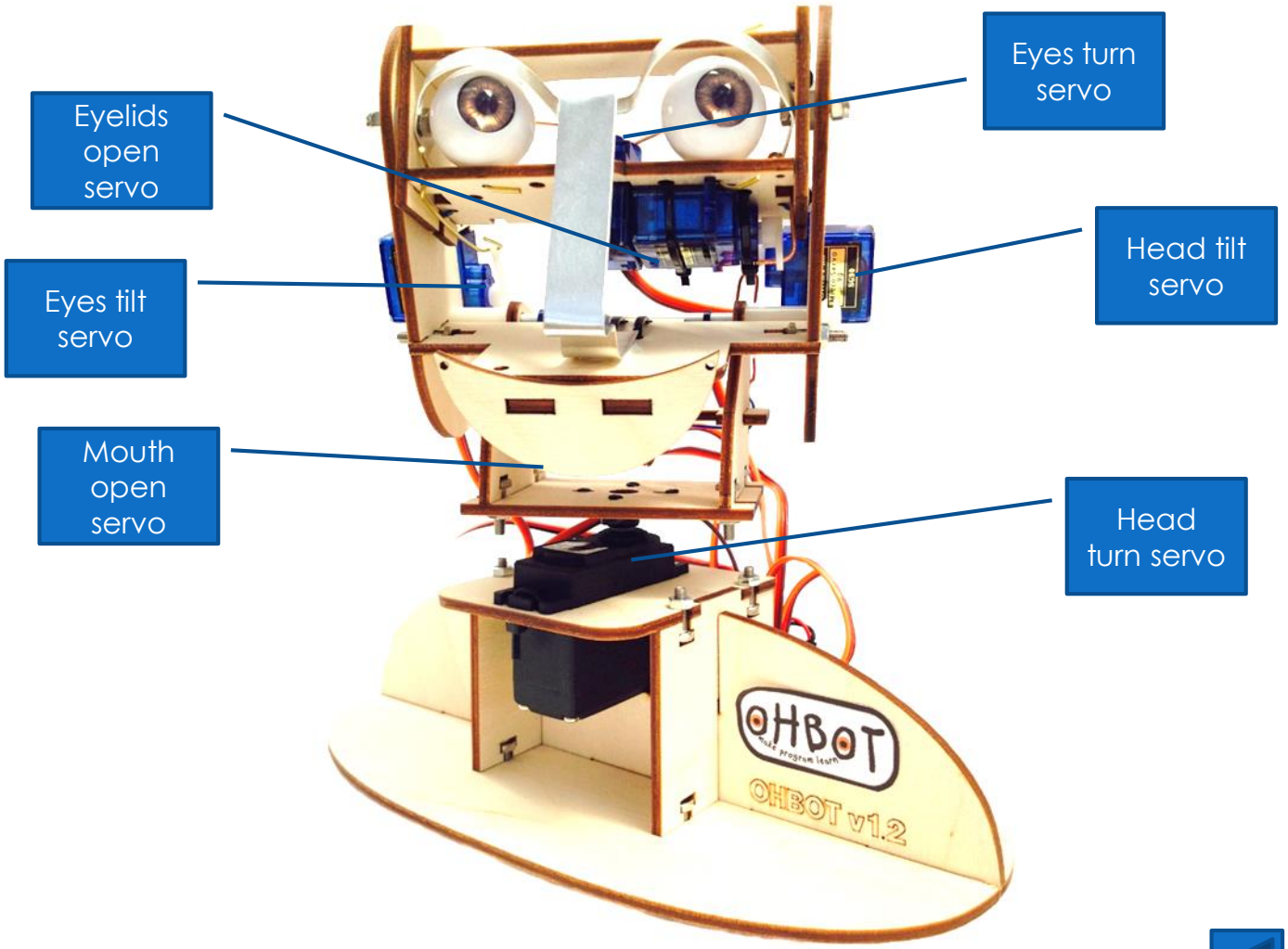


Making Instructions

For Ohbot Version 1.3

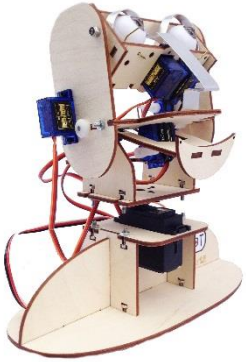
Ohbot

Ohbot has six servo motors.



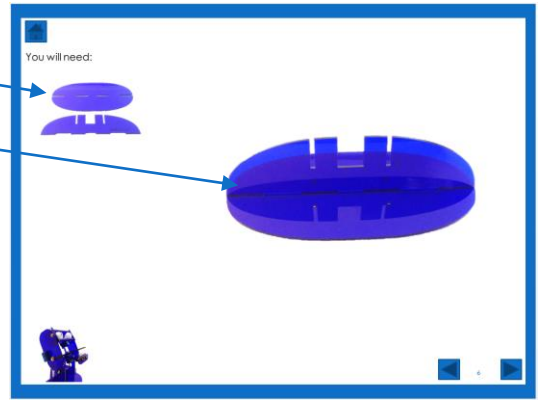
You will need…

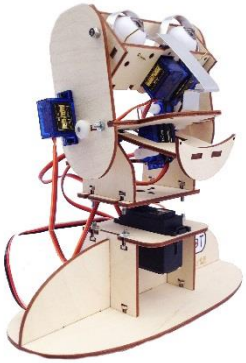
- The kit
- A pair of sharp scissors
- Long nose pliers
- The Ohbot Part Finder sheet
- A PC with Ohbot software installed
- Time; Ohbot can take two or more hours to construct



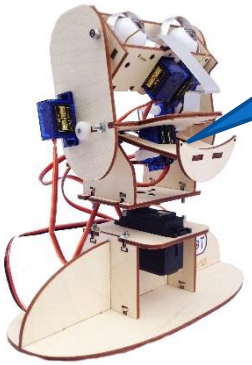
How to follow the instructions

- Each page in the instructions is a step in construction
- It will show you what you need for that step
- The picture shows you how to assemble it
- If you need tools it will show this too
- Good luck making your new friend!

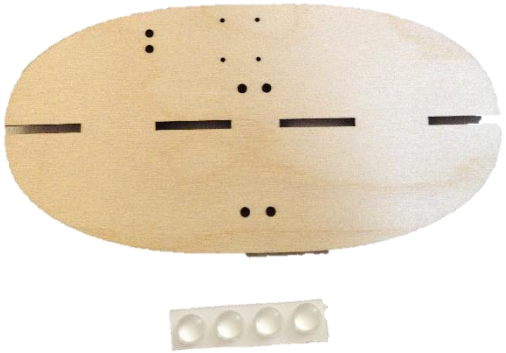




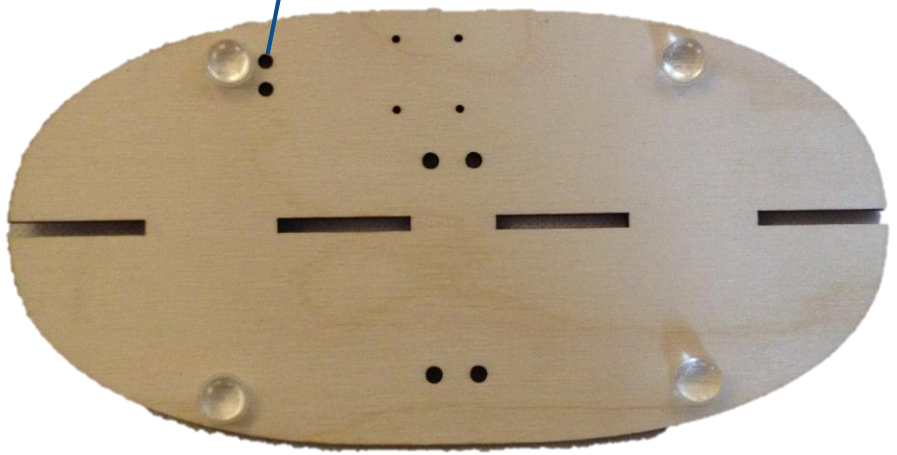
Before you start construction find all the wood parts and peel off the sticky protective paper from both sides.

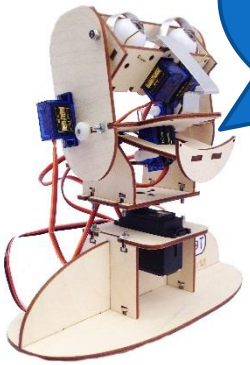


You will need:



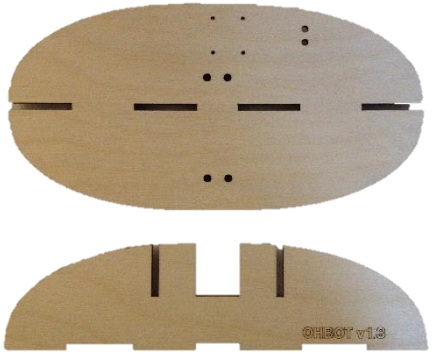
Make sure these two holes are top left and the base plate is orientated as shown here.

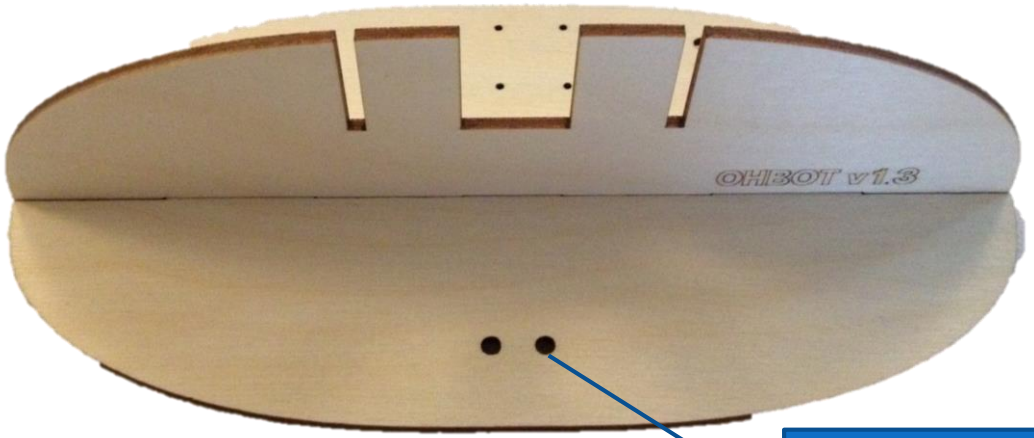




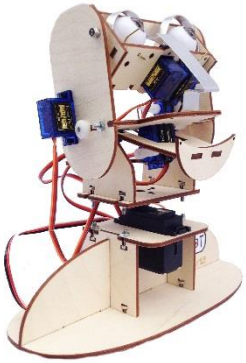
We're off. This step is a nice easy one – sticking on my feet!

You will need:





Orientate the horizontal base piece so that the half with two holes is to the front (Ohbot v1.3 label forward)



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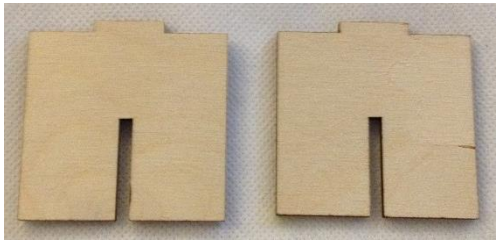

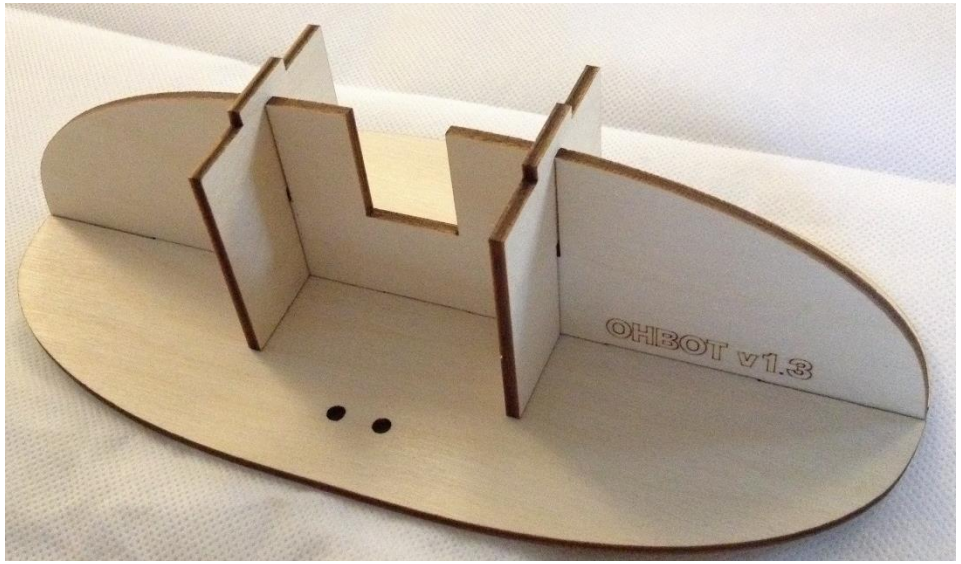

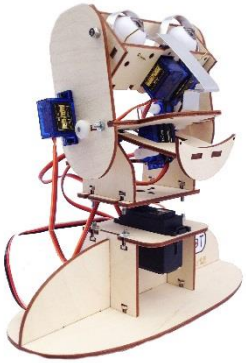

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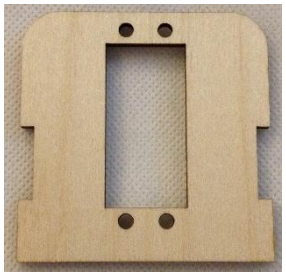
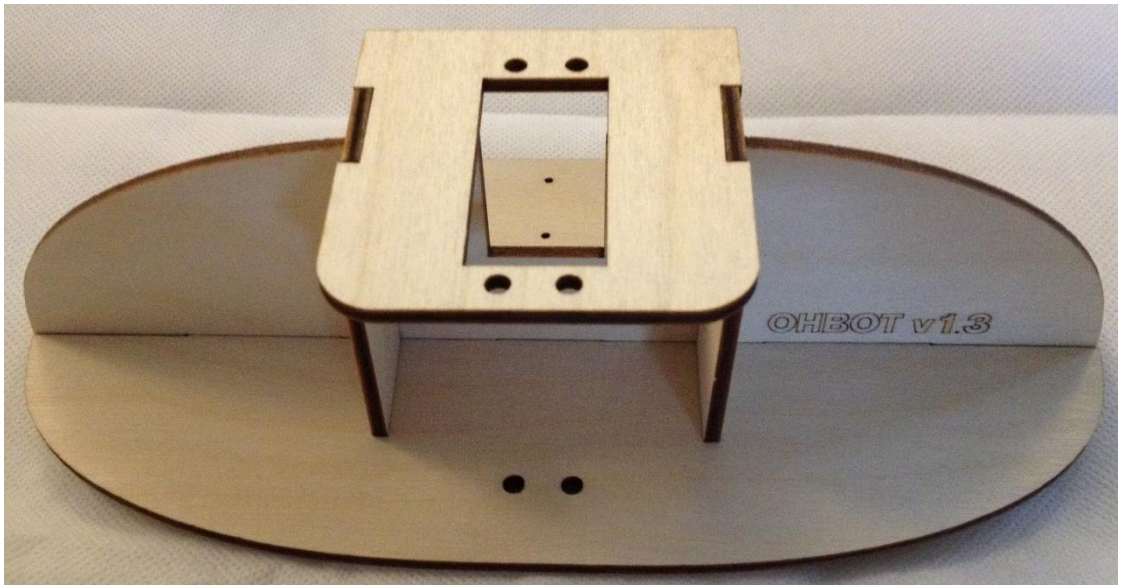
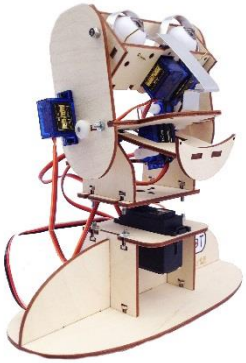


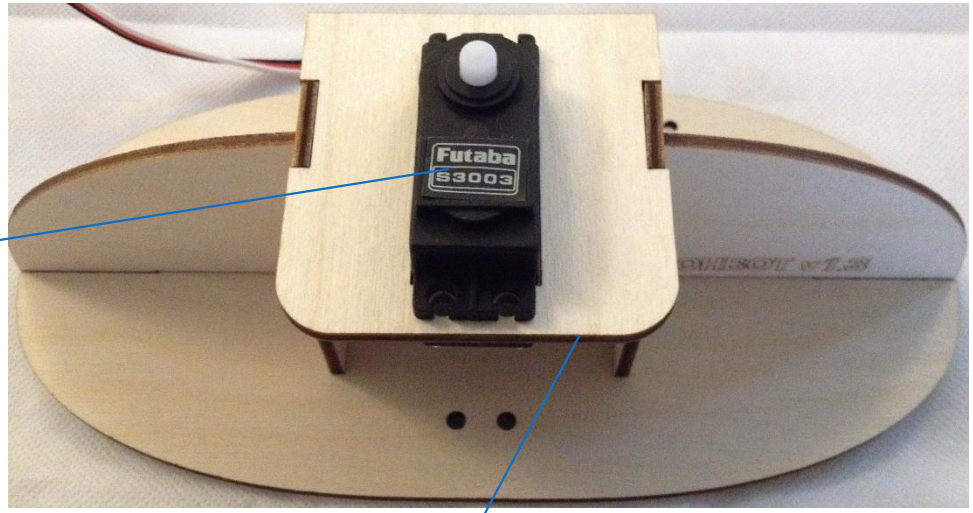




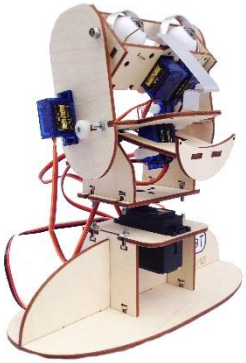
You will need:

servo this way around

Text upright



Curved edge to the front



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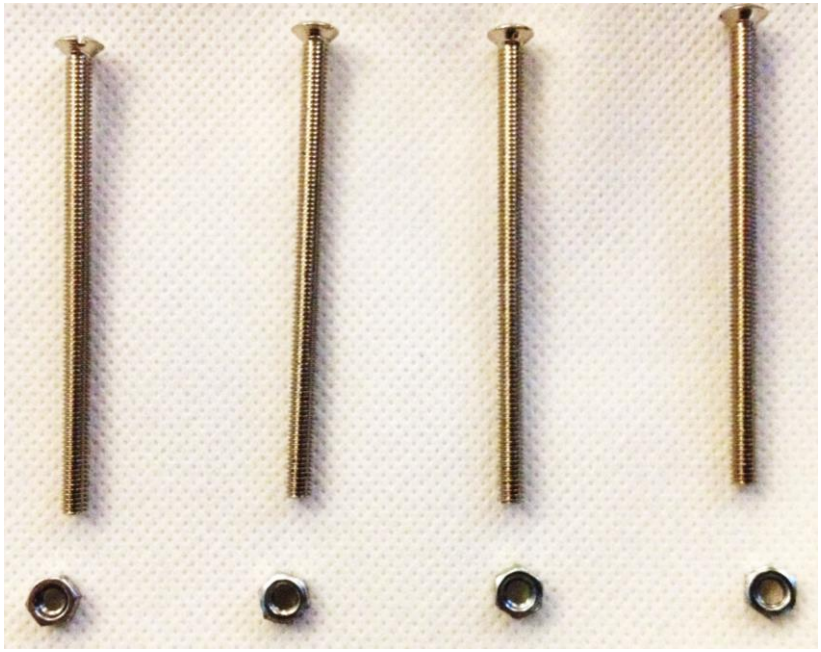
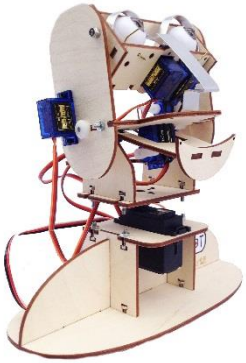
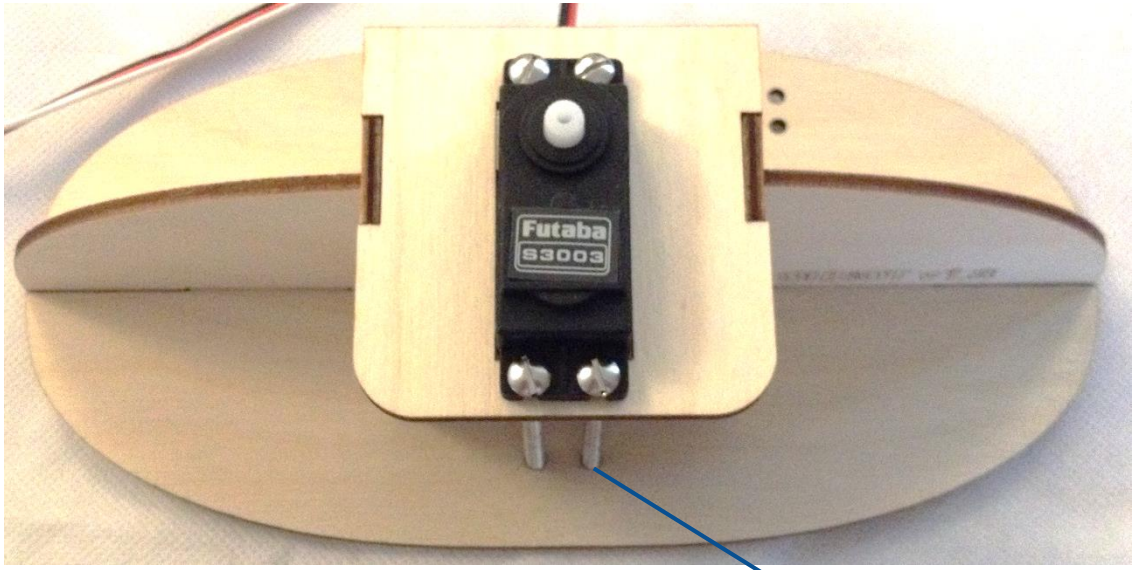


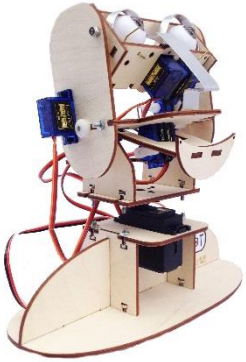


You will need:

60mm bolt

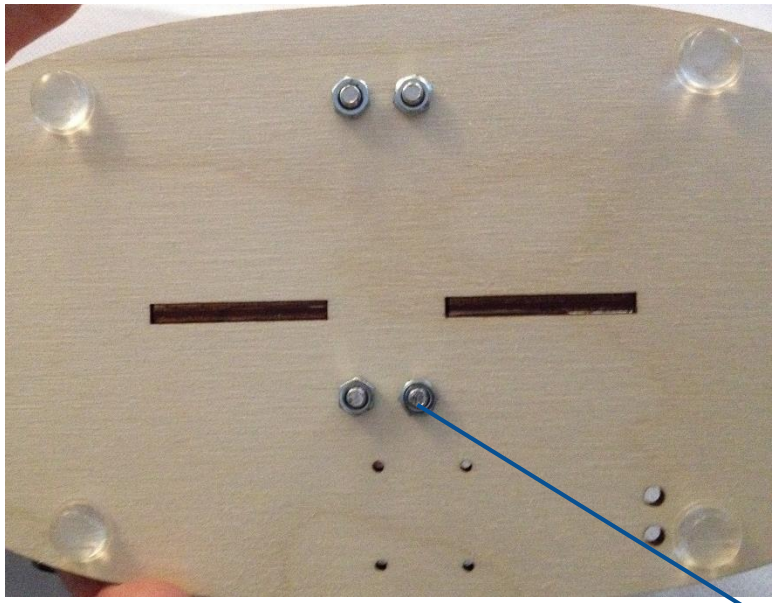


Thread bolts through the holes in the base

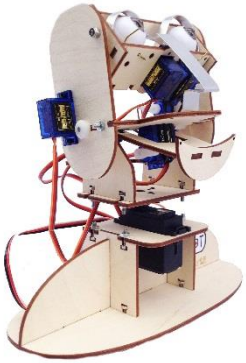


You will need:

large nut

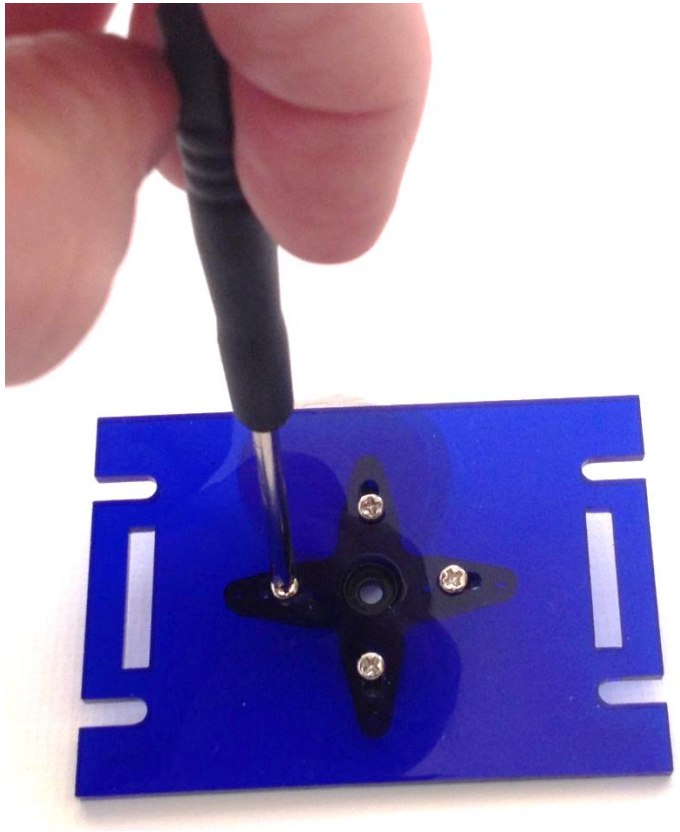


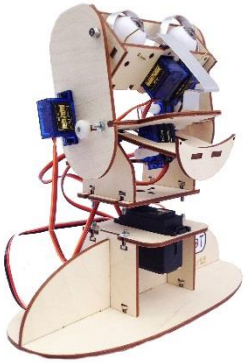
Avoid over tightening these



You will need:

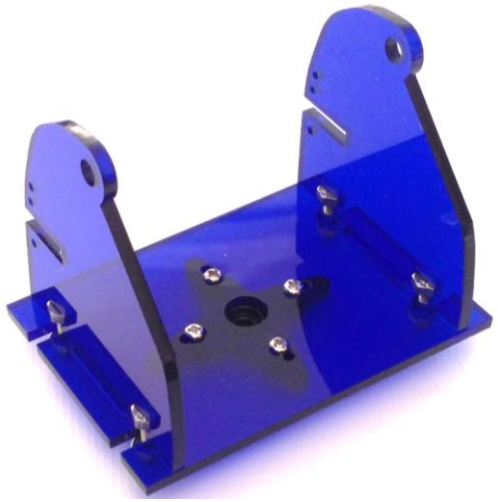
small servo screw

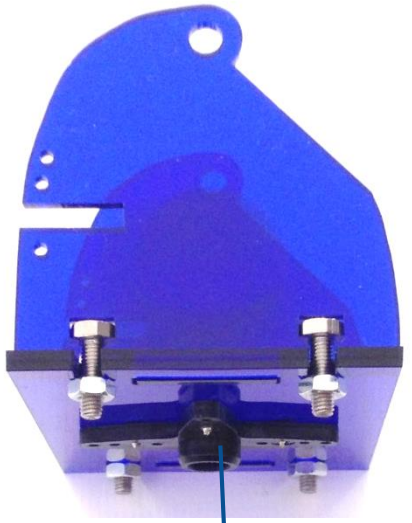




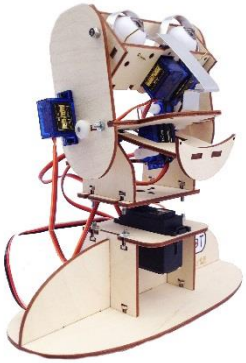
You will need:

10mm bolt
nut





The black servo cross arm should be on the underside



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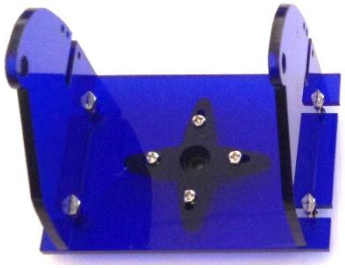
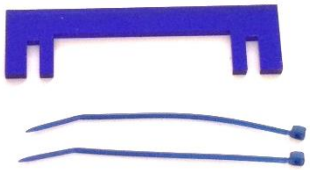
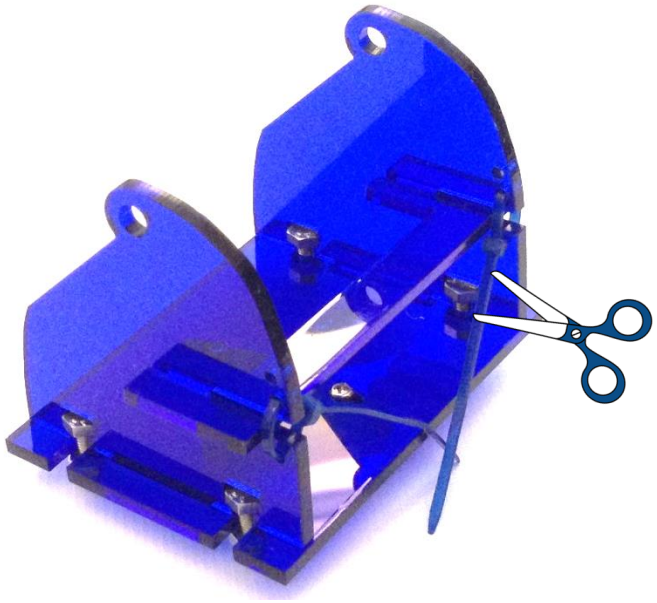
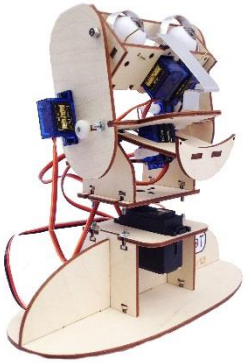


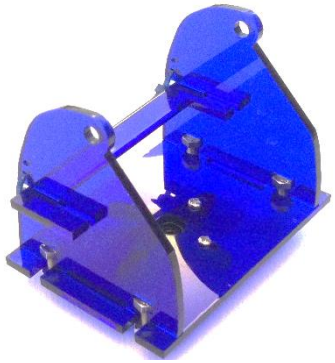


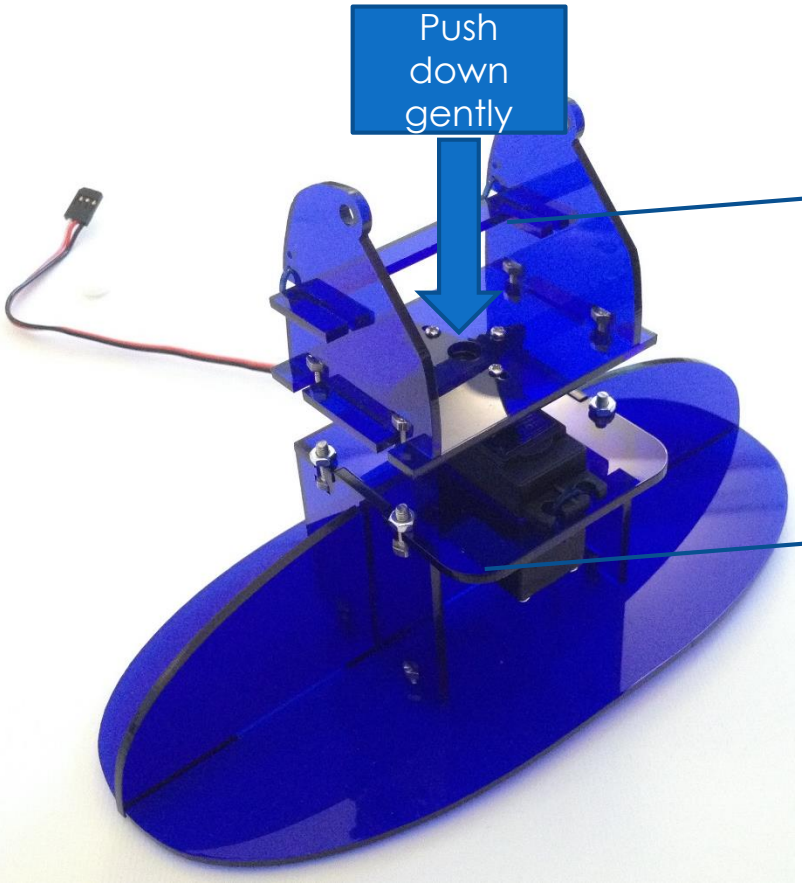
short cable ties

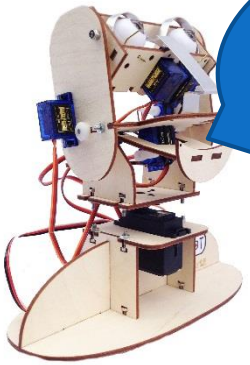




You will need:

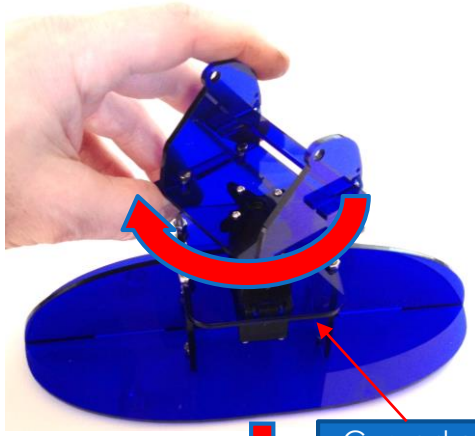




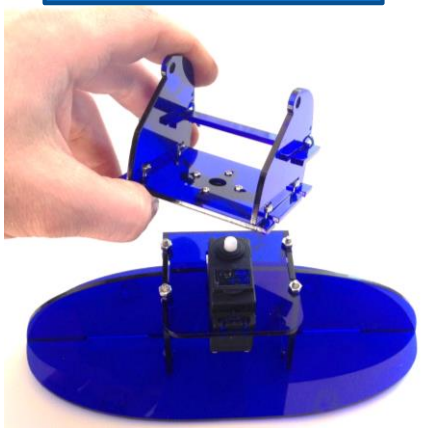


The next few steps will set up the head turn servo.

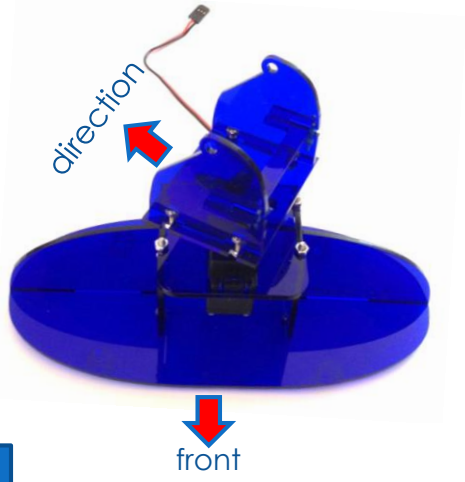
1. Gently turn the neck piece clockwise as far as it will go



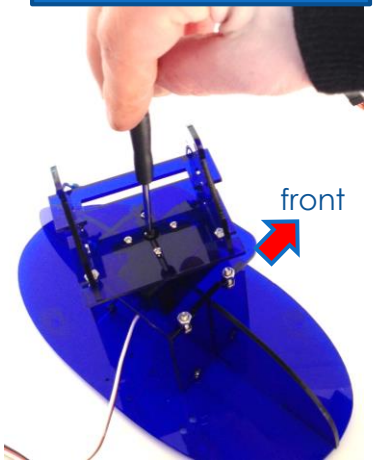
2. Lift off the neck piece

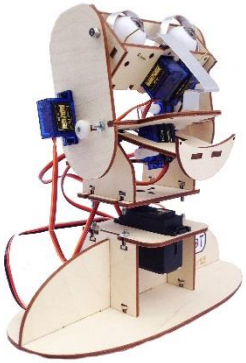


3. Orient the neck piece in the position shown, then push it back onto the servo



4. Screw the neck piece onto the servo (shown here from behind)



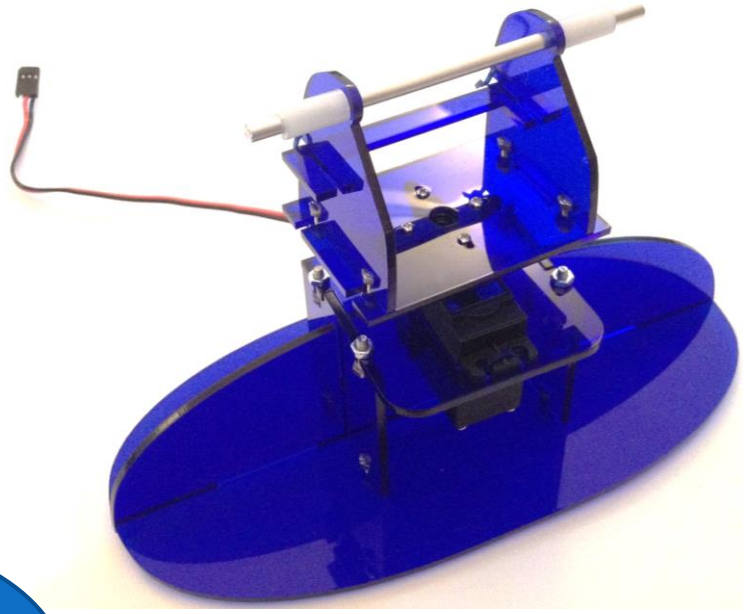


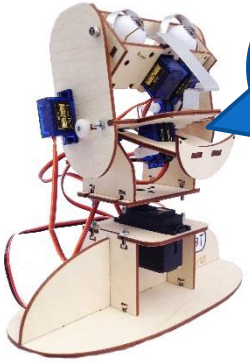
You will need:

Large servo screw. It's in the bag with the large servo

You will need:

spacer

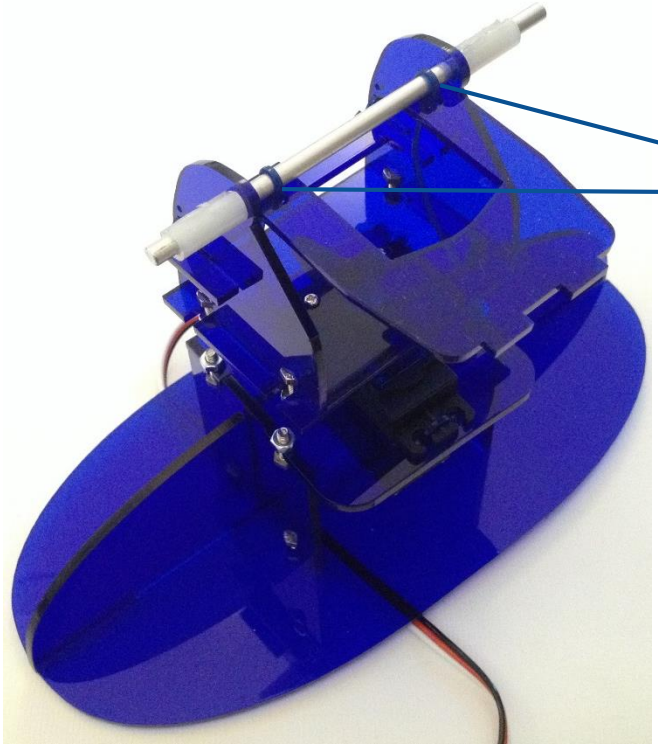




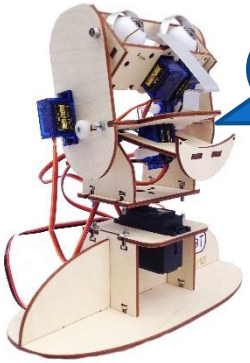
This is a pivot so Ohbot's head can tilt up and down

You will need:

short cable ties

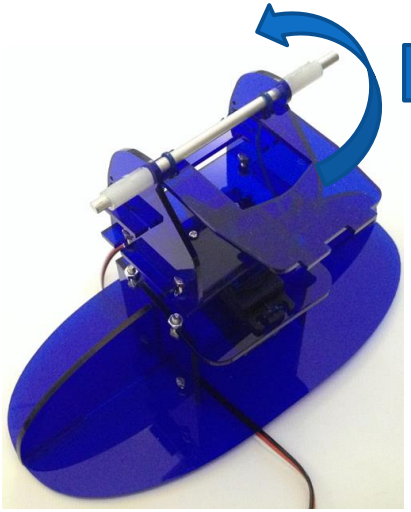


Leave the cable ties loose so that the jaw can move freely easily

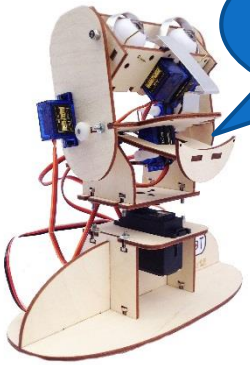


Nice, now Ohbot's got a lower jaw.

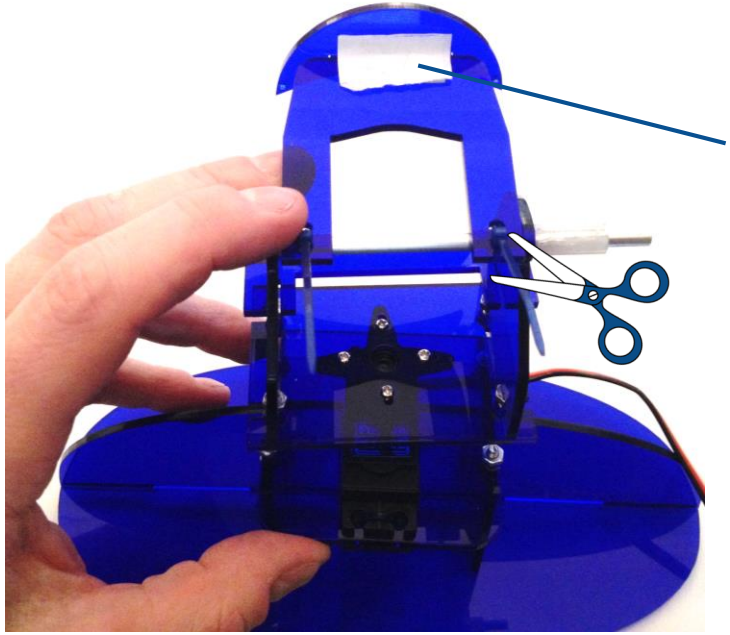
You will need:



Lift lower jaw



Smile!

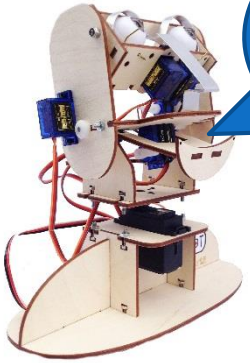


Attach pad to the underside to secure the lip.

You will need:

servo goes this way round

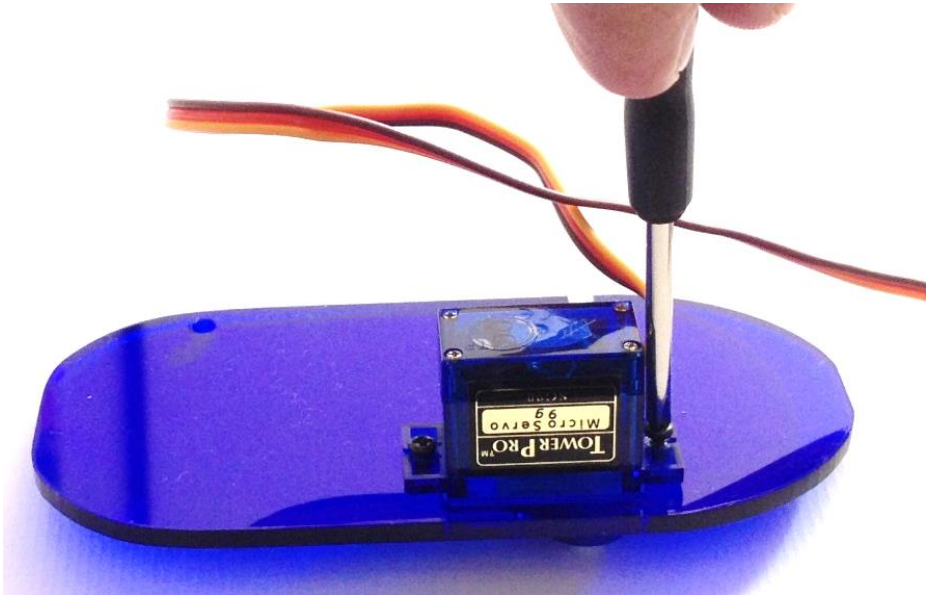
not this way

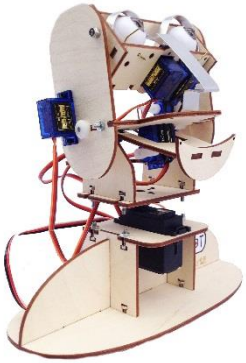


You're making Ohbot's right cheek! This servo moves its eyes up and down.

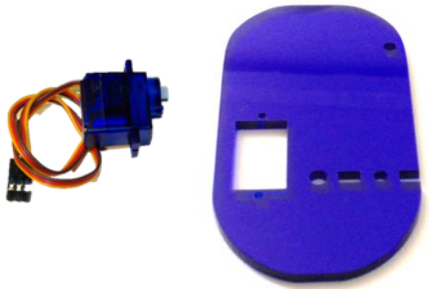
You will need:

small servo screw

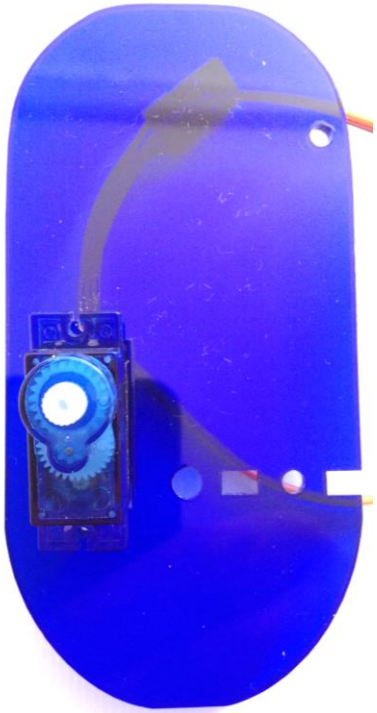




You will need:

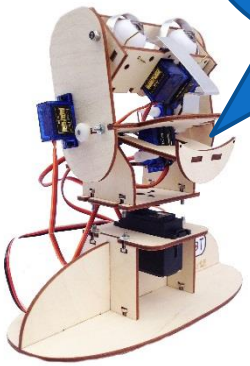


servo goes this way round



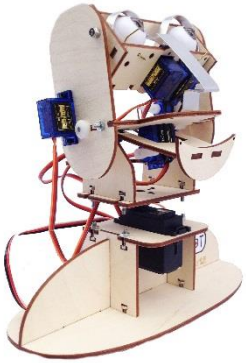
not this way

Now you're making Ohbot's left cheek! This servo will tilt its head up and down.

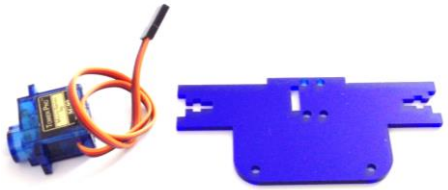


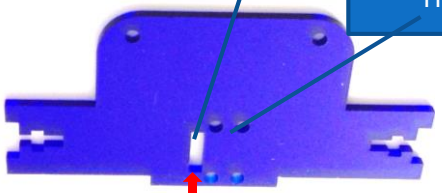
You will need:

small servo screw

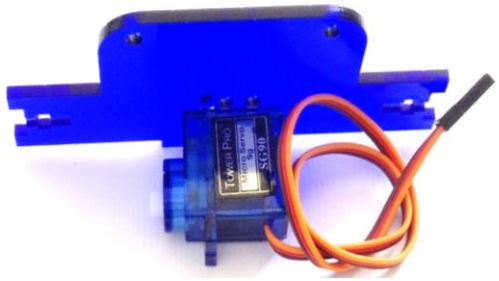


You will need:





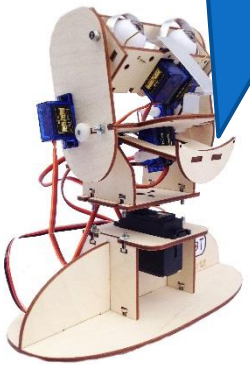
Orient this so the slot is on the left and these holes are on the right



wire down

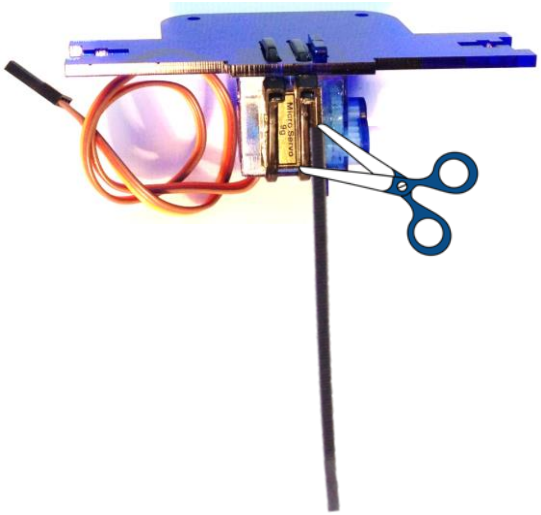
Servo drive shaft on left

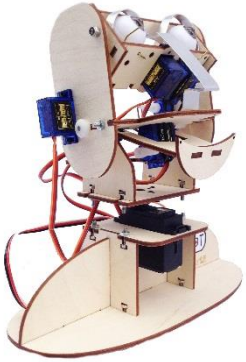
This is Ohbot's top lip. The servo moves the bottom lip up and down.



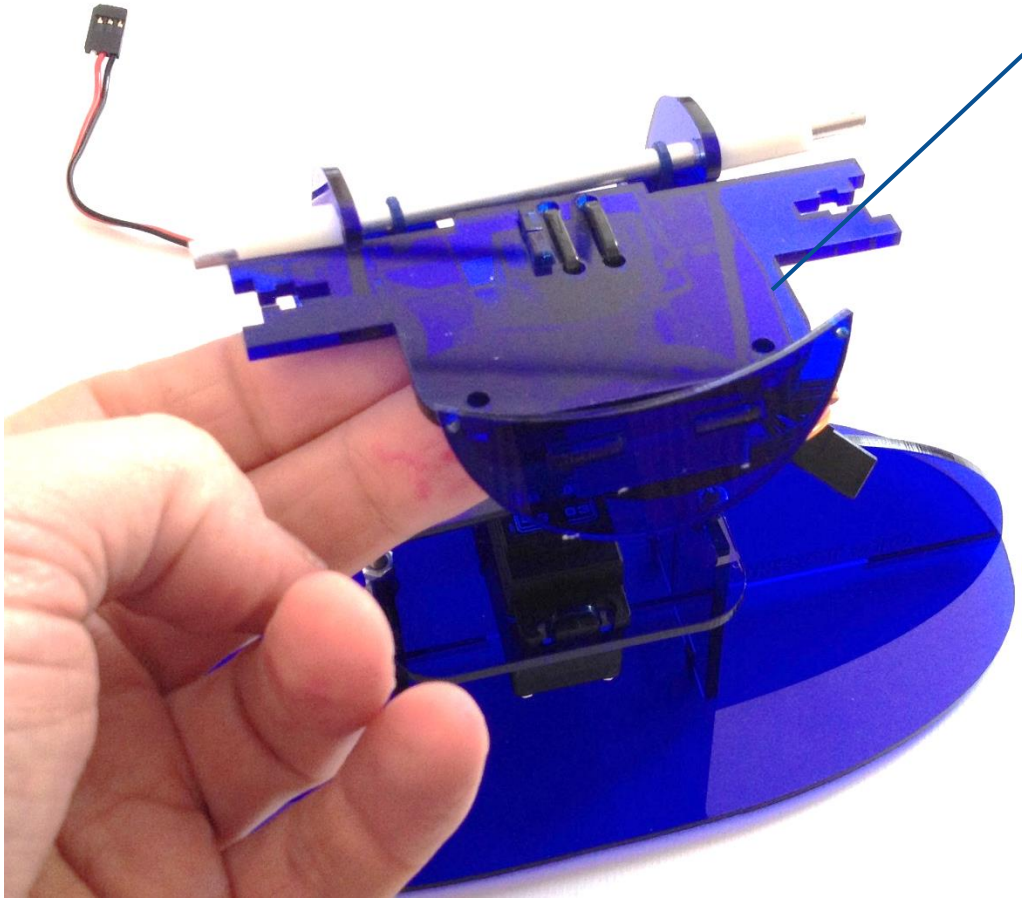
You will need:

long cable ties

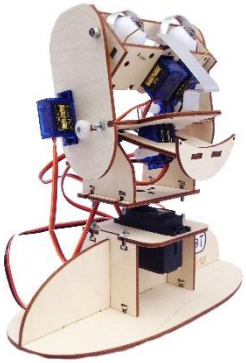




You will need:



Rest the top lip on the lower jaw

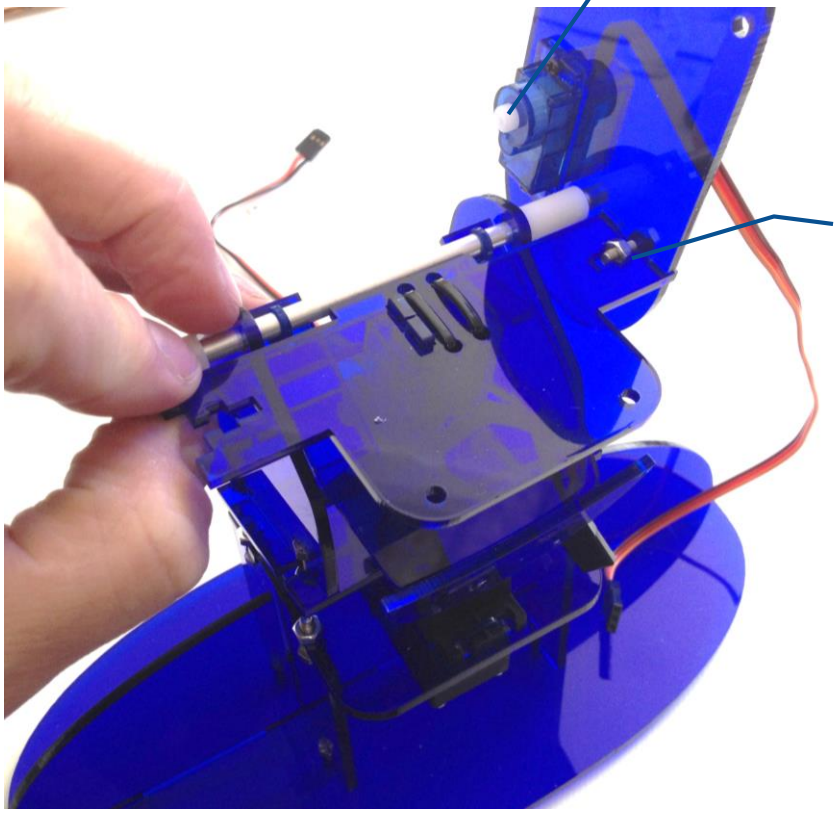


You will need:

Ohbot's left cheek

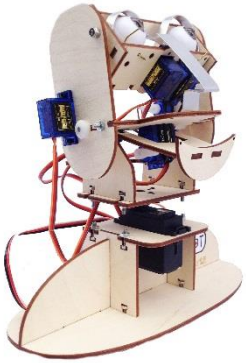
10mm bolt

nut



White cylinder should point in

Nut and bolt fasten the cheek to the upper jaw

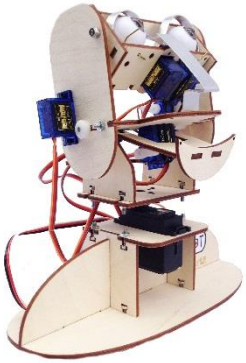


You will need:

Ohbot's right cheek

10mm bolt

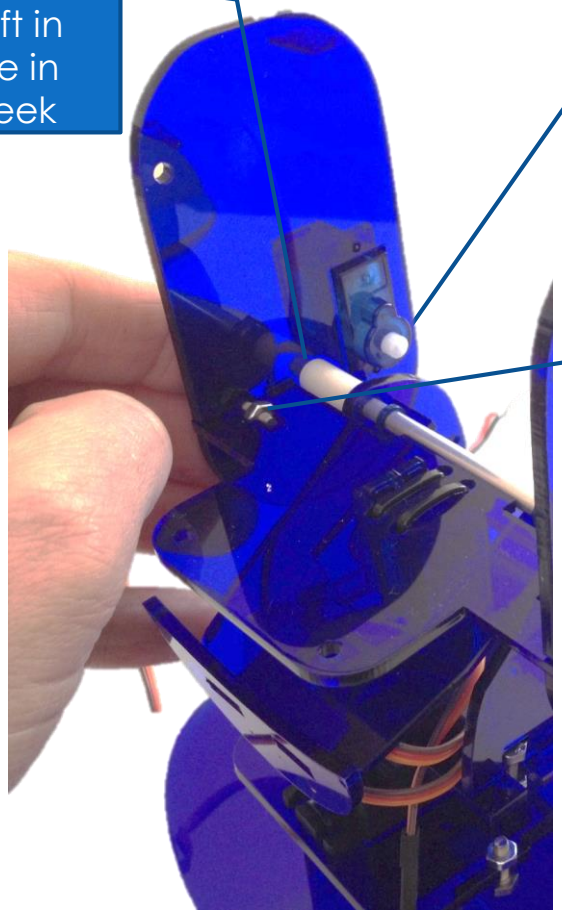
nut



Locate the end of the aluminium shaft in hole in cheek

White cylinder should point in

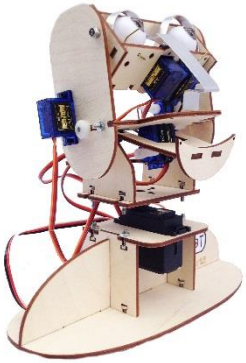
Nut and bolt fasten the cheek to the upper jaw



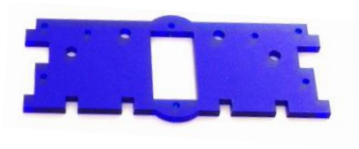
You will need:

grommet

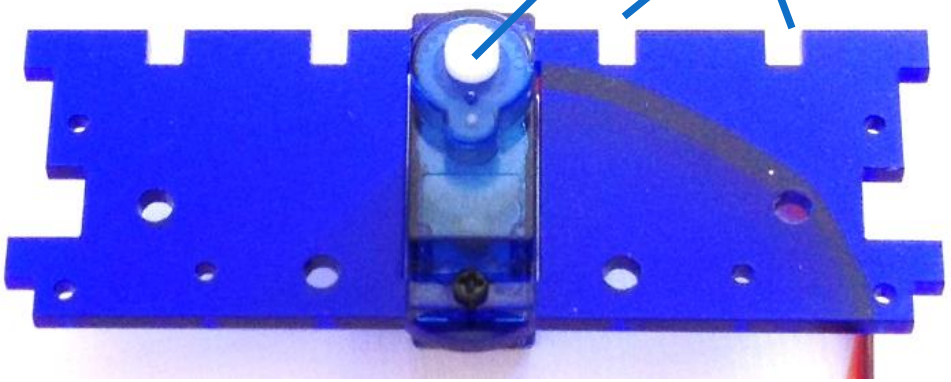
Push a grommet onto each end of the aluminium shaft



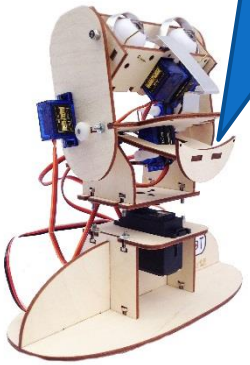
You will need:



The white servo shaft should be on the side nearest the notches

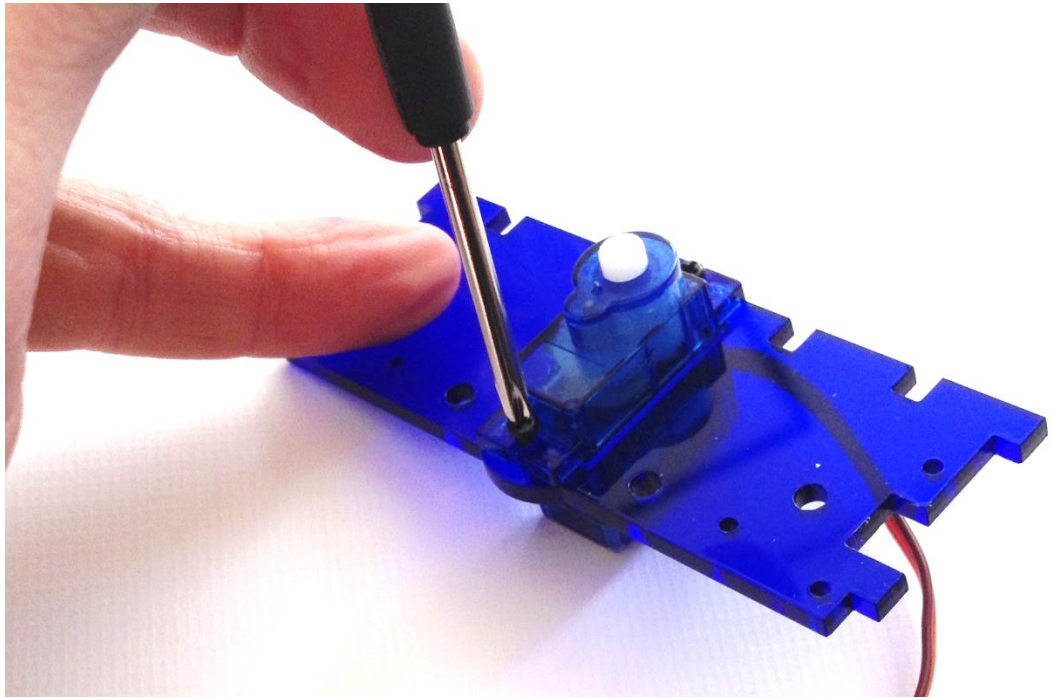


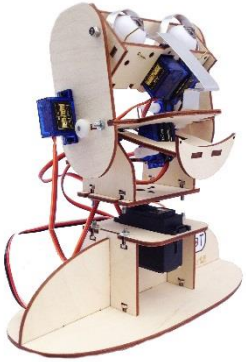
You've got this far, great work! This is Ohbot's eye box. This servo will move its eyes left and right.



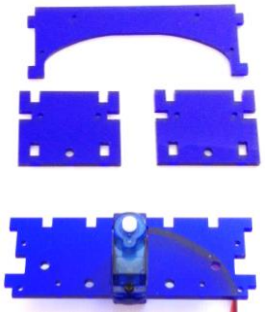
You will need:

small servo screw

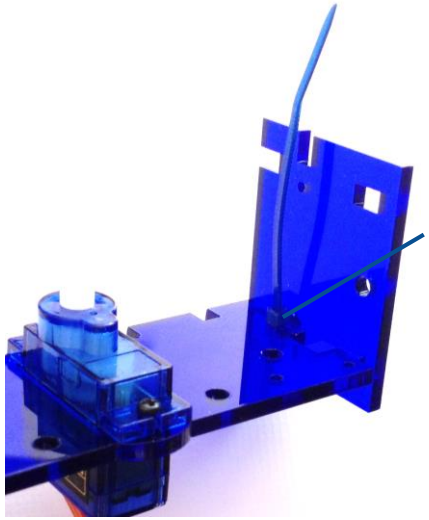




You will need:

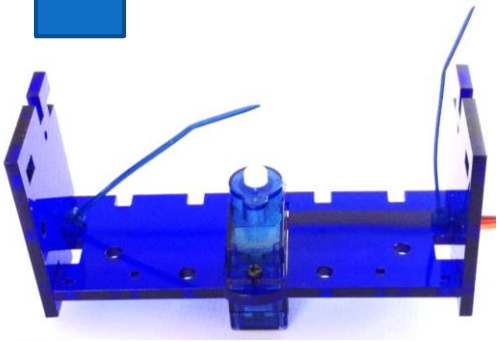


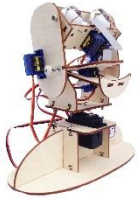
short cable tie



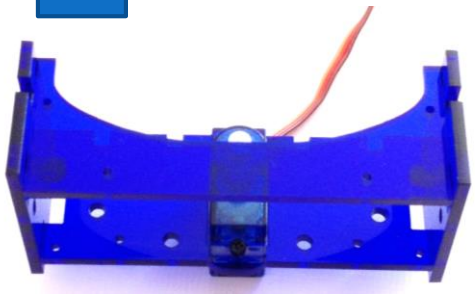
1. Fasten the sides using cable ties through the holes. Make sure that the 'buckle' is on the inside of the eye box.

2.

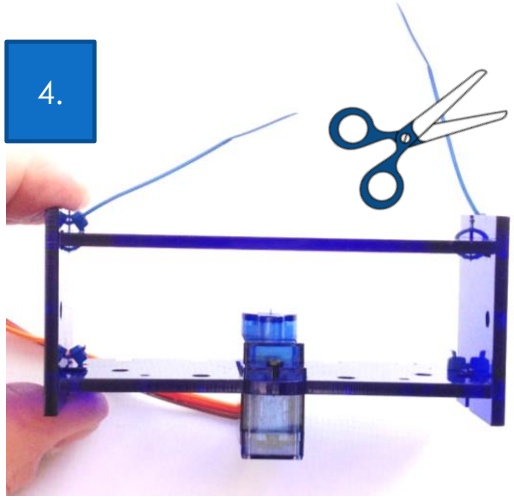




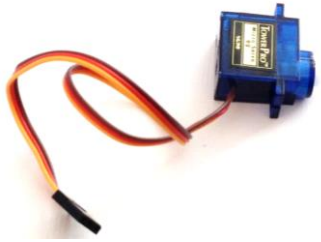
3.

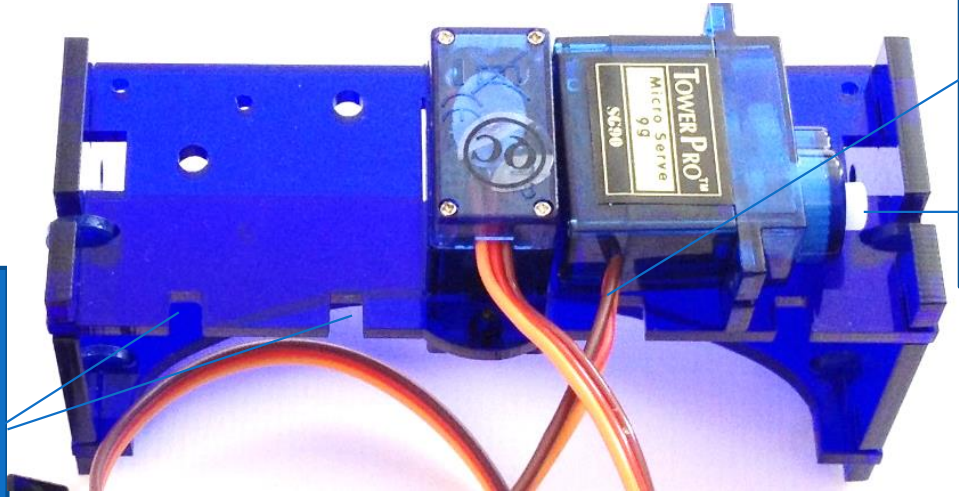


4.



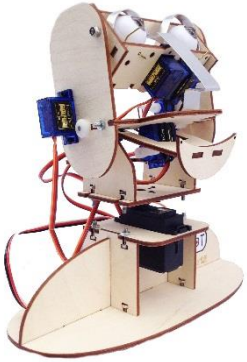
You will need:



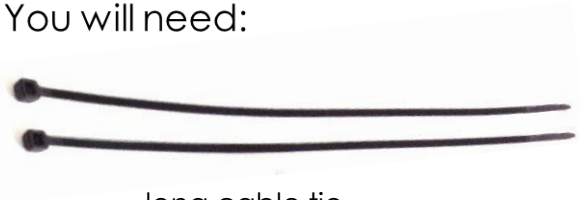


1. Turn the eye box so that the curved side is down and the notches towards you

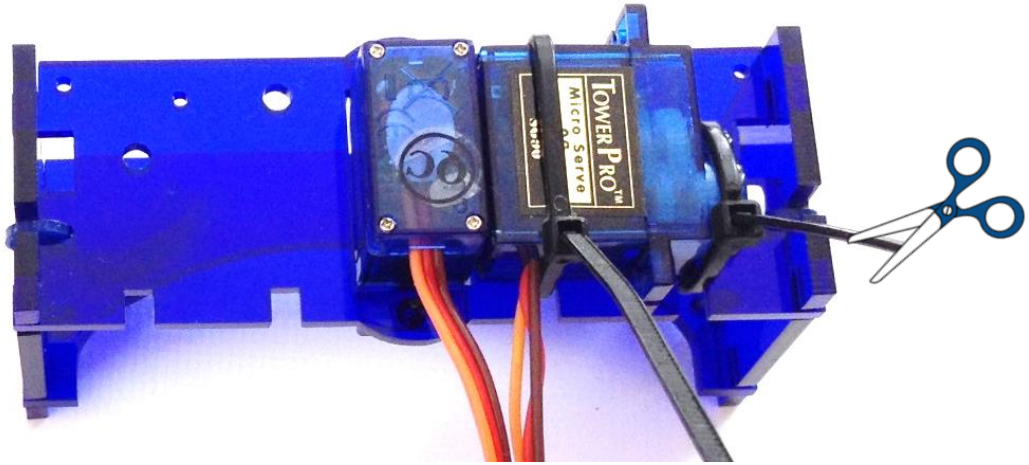
2. Place the servo so that the wire exits towards you and the white servo shaft points right

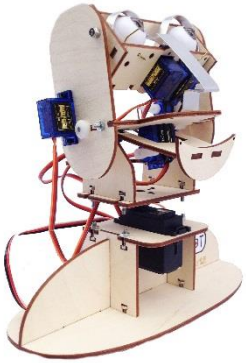


You will need:



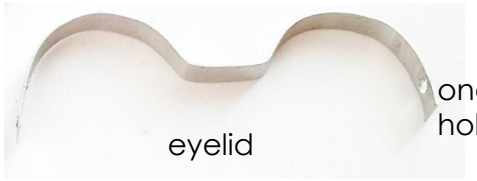
long cable tie





You will need:

two holes

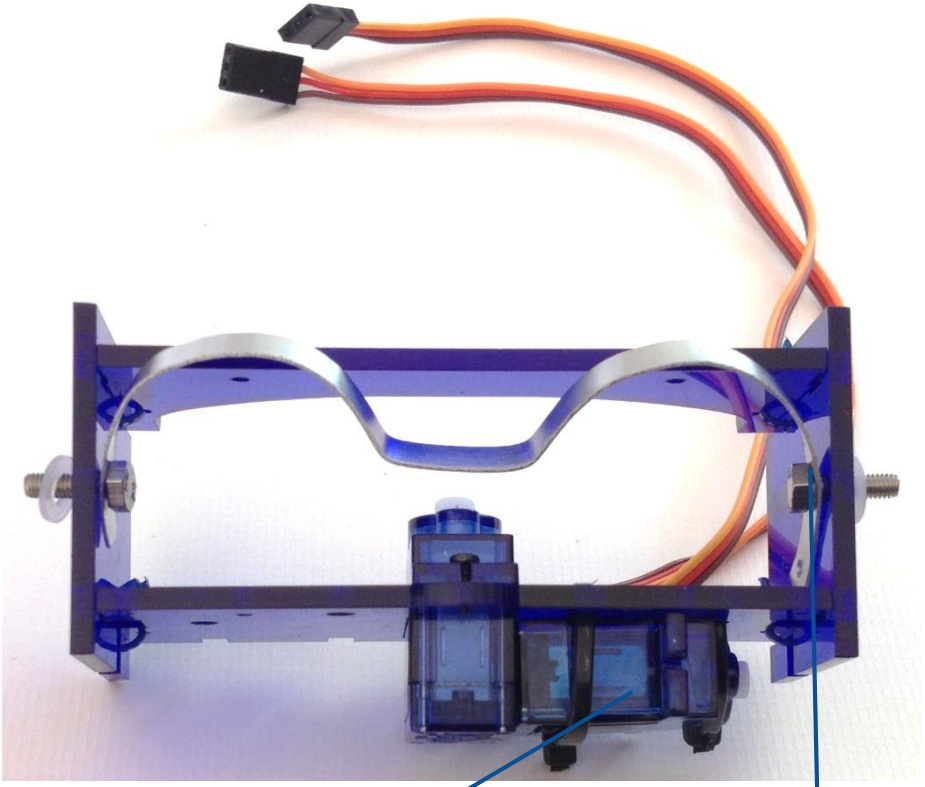


eyelid

one hole

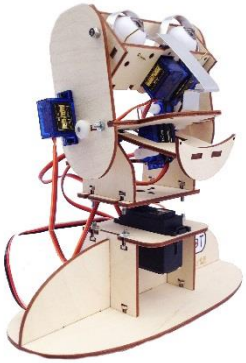
12mm bolts

plastic washers

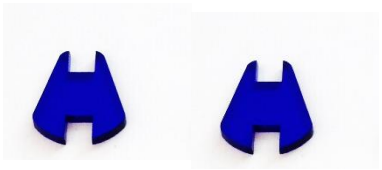


eyelid servo

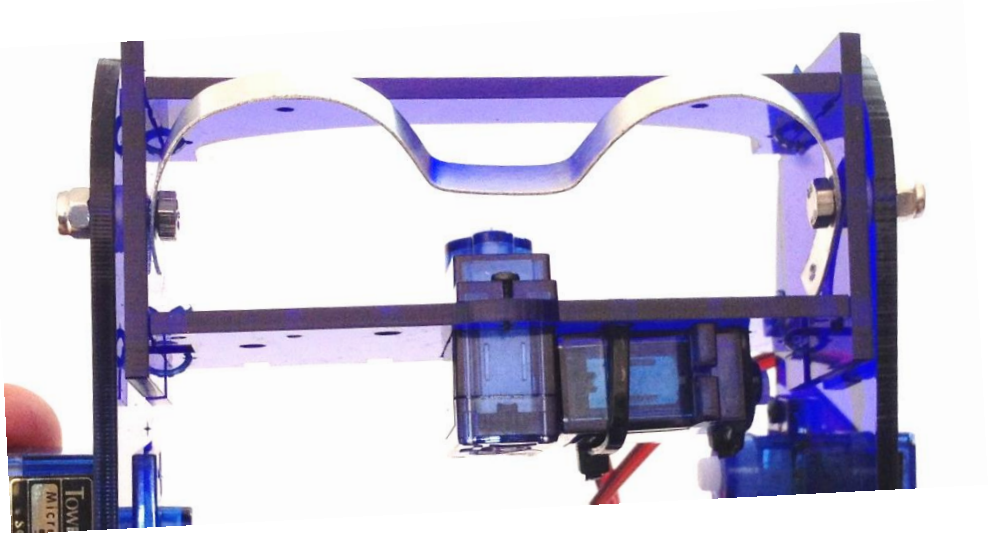
the two hole end of the eyelid should go on the right so that the eyelid servo arm can connect

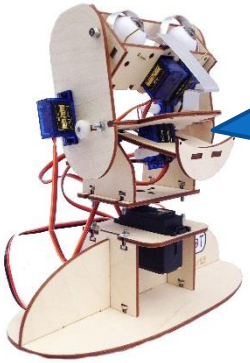


You will need:



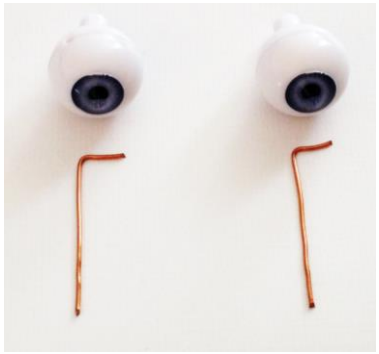
locking nut



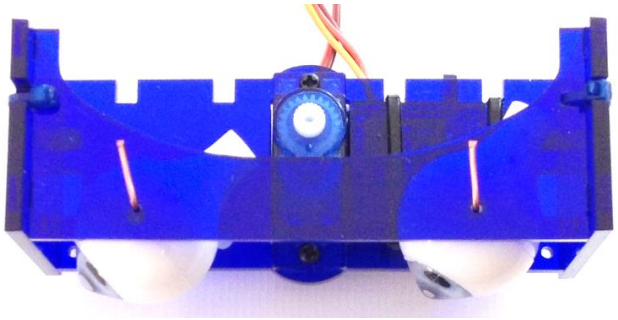


Tighten the nuts just enough to lock but still allow the eye box to tilt freely

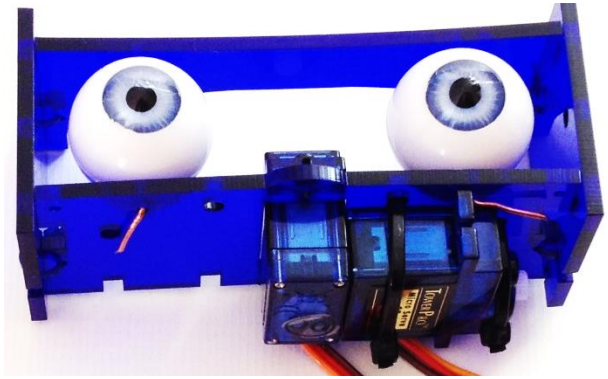
You will need:

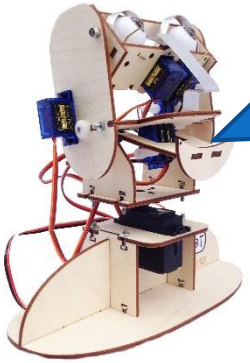


top



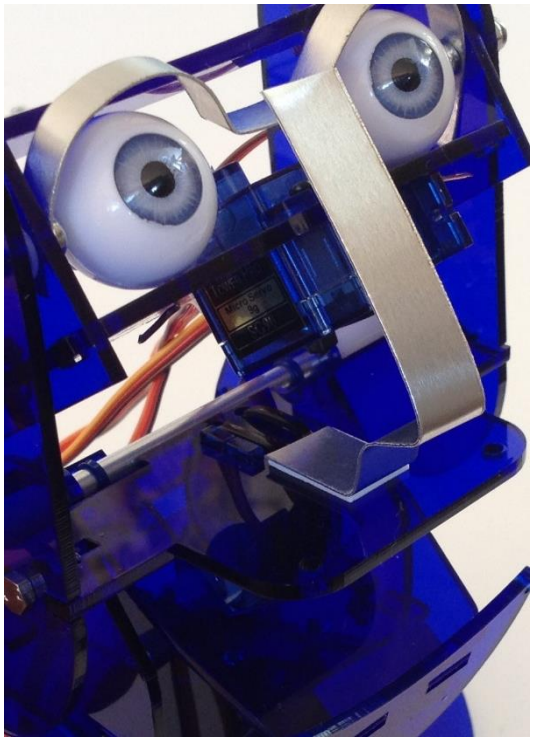
underneath

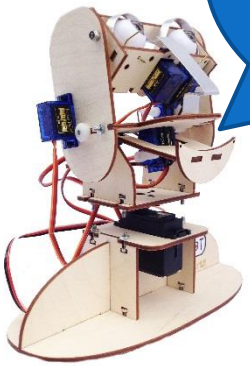




It might help to use a pair of pliers to straighten the wires first.

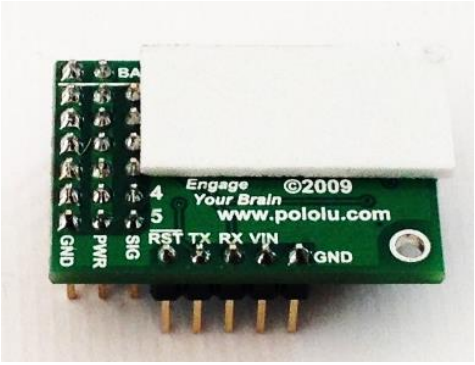
You will need:



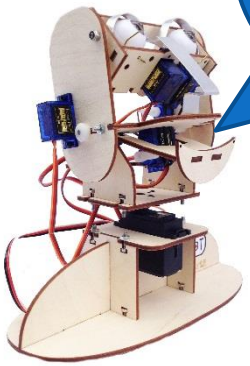


Do feel free to make your own nose and accessories

You will need:

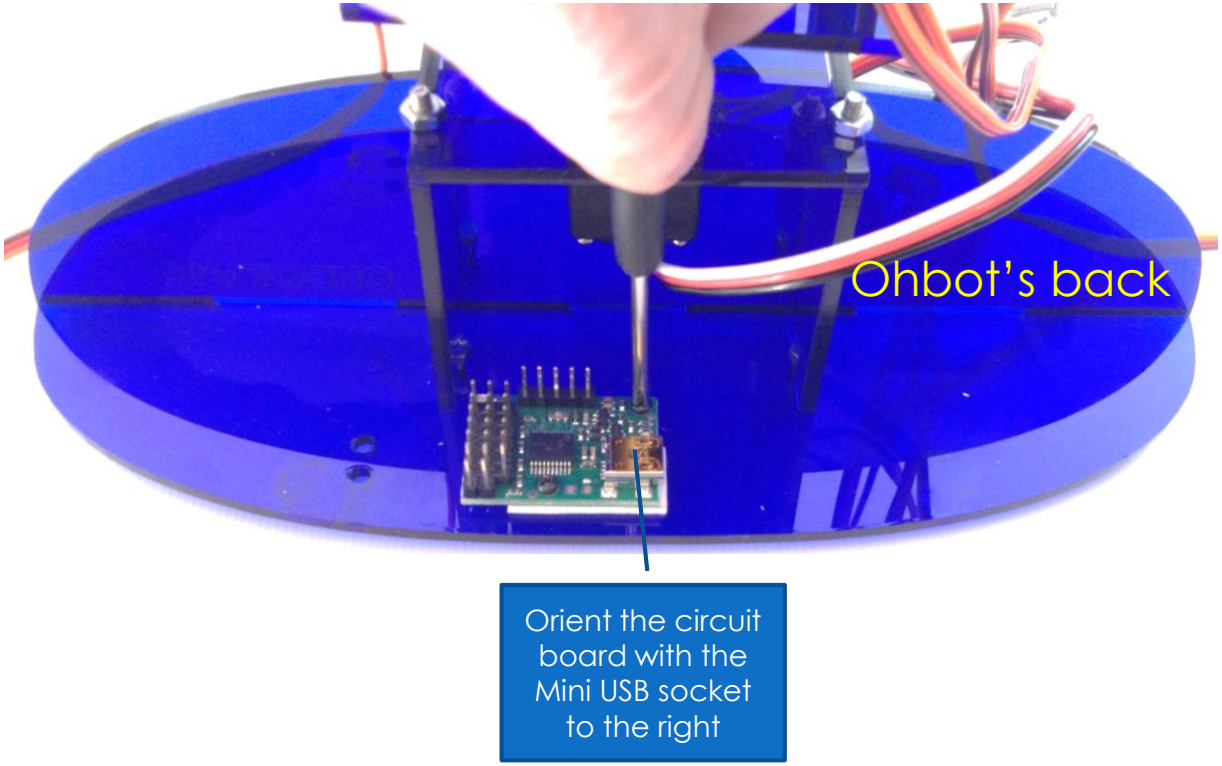


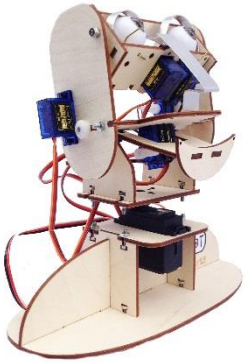
This board allows the computer to control Ohbot's servos. It can also be used to input data from sensors.



You will need:

small servo screw

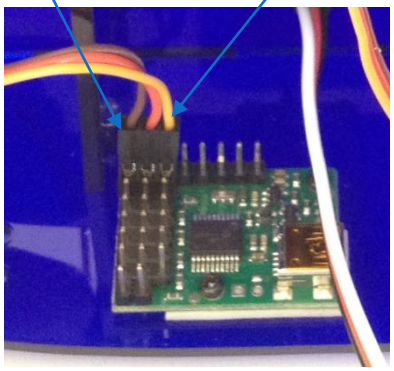




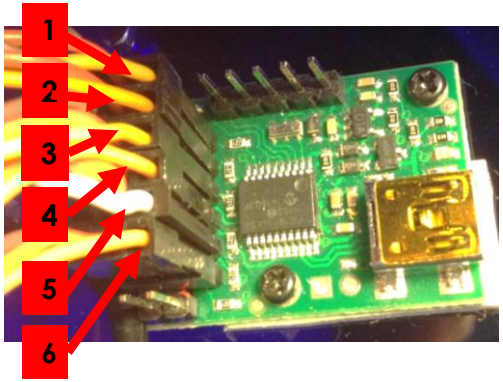
Brown or black on this side

Yellow or white on this side

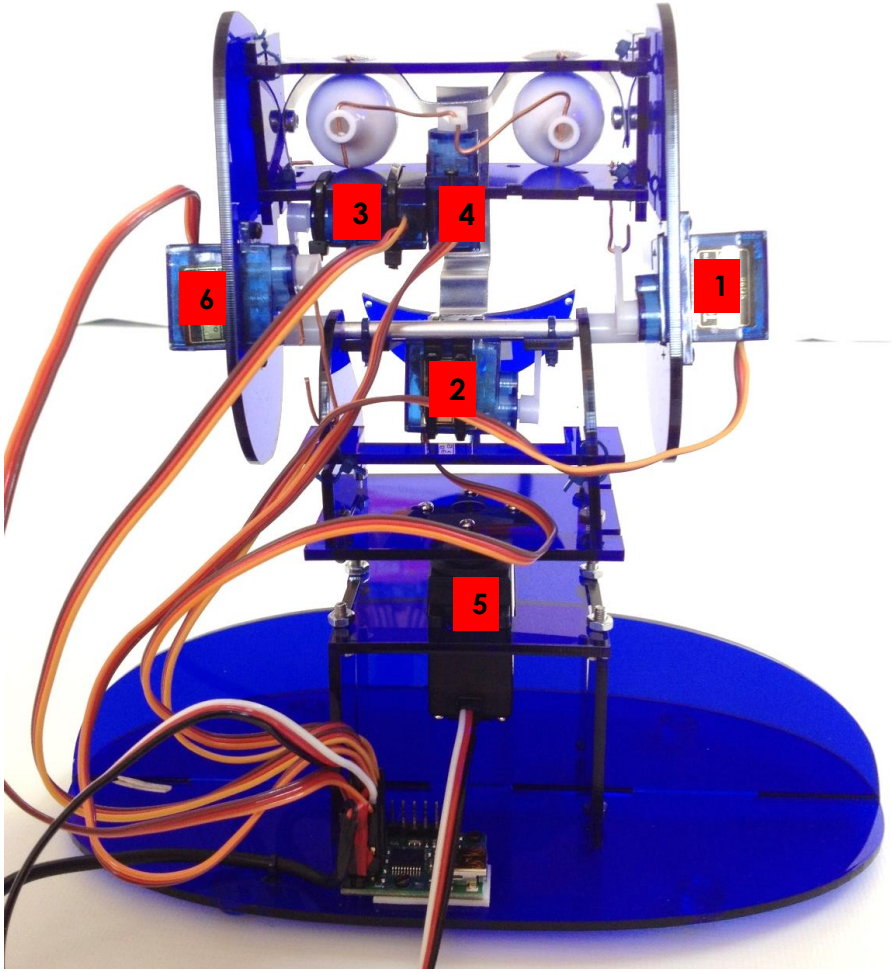
1. Find the plug for the servo marked 1 on the photo. Plug it into the board in the position shown. Make sure the yellow/white wire is to the right and the brown/black is to the left



2. Do the same for the servo marked two, plugging it into the next position forward. Continue this until you have plugged all six servos into the board.

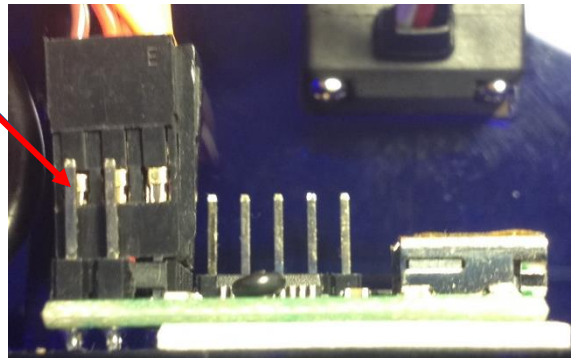


This picture shows the servo links connected. It is best to connect Ohbot to your computer and check that the servos are all working before connecting the links. (as shown pages 47-52)



You will need:

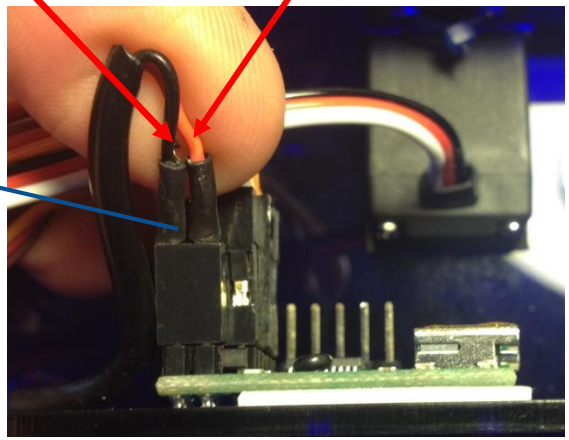
1. Find this pair of pins



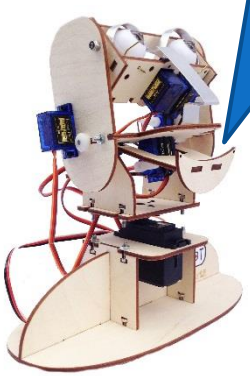
Black on this side

Red on this side

2. connect the power supply socket like this

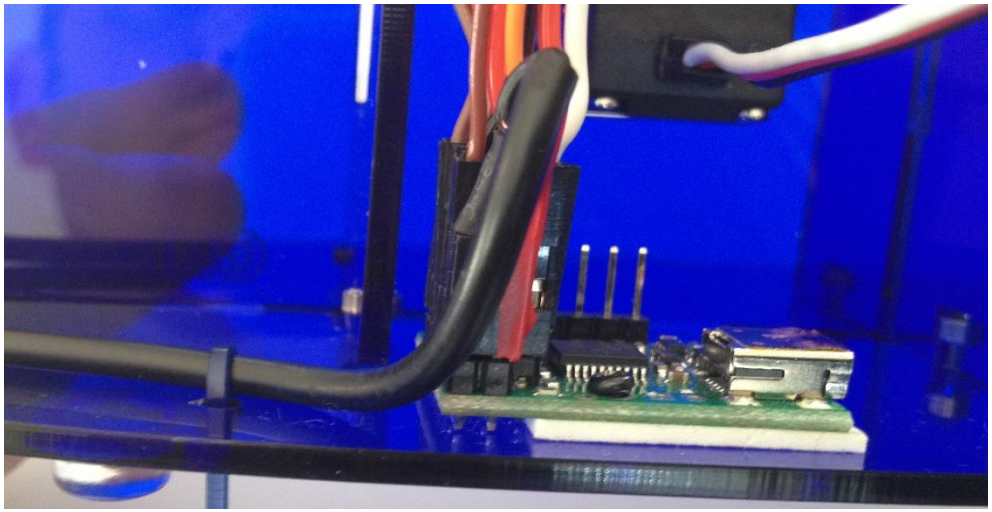


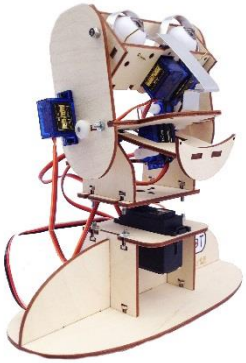
Take care to get the power wires the right way around, or the servos will be damaged.



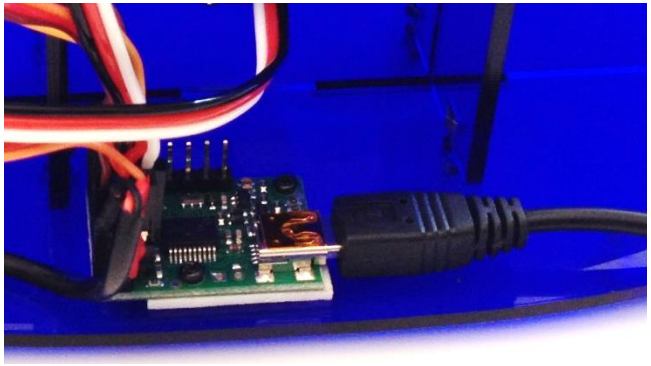
You will need:

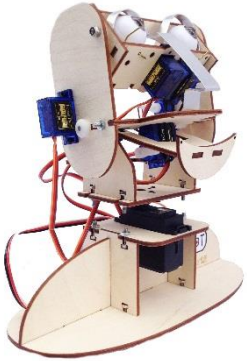
Long cable tie





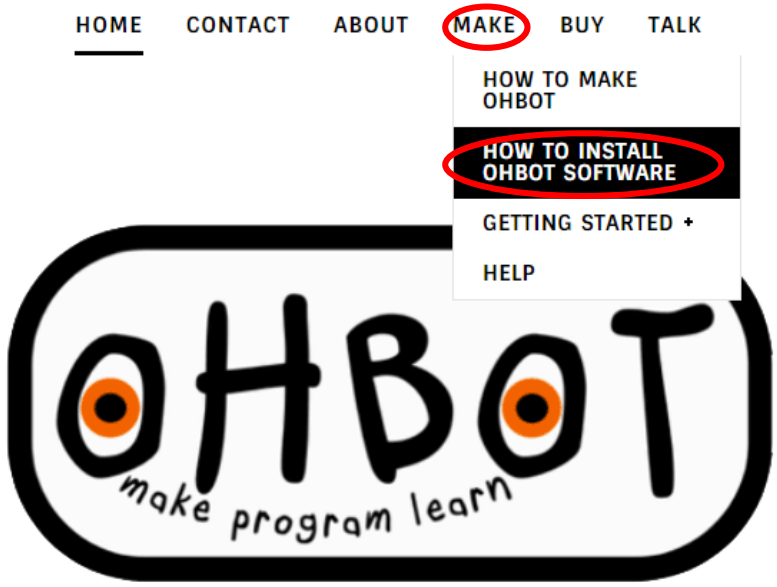
You will need:

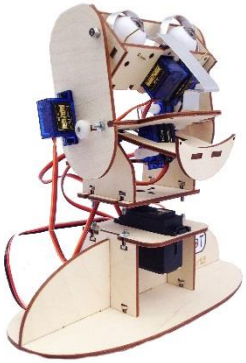




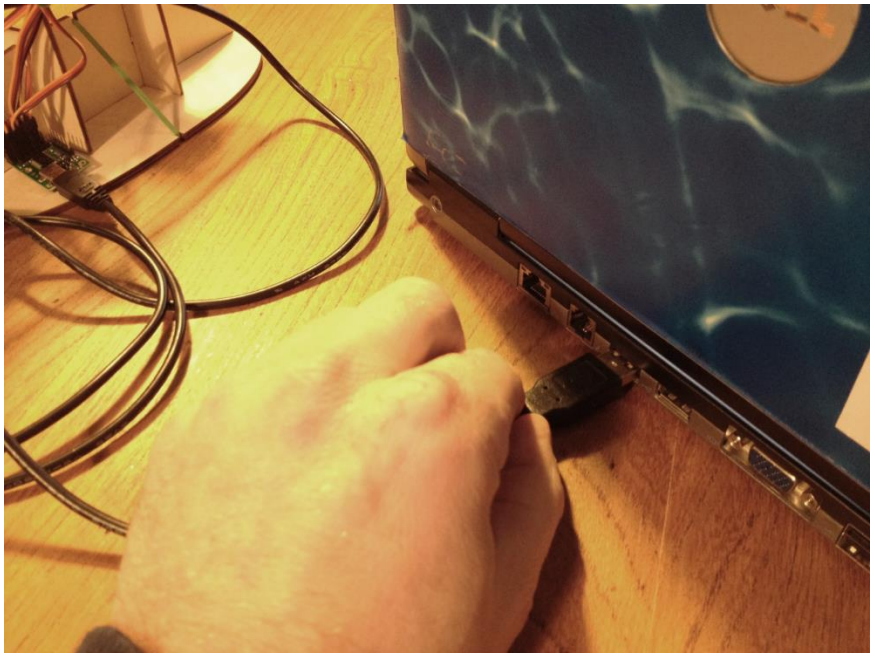
Install Ohbot Software

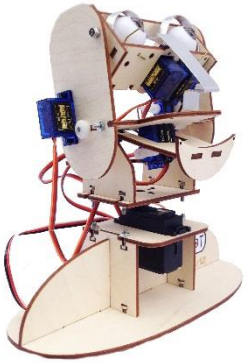
Go to www.ohbot.co.uk



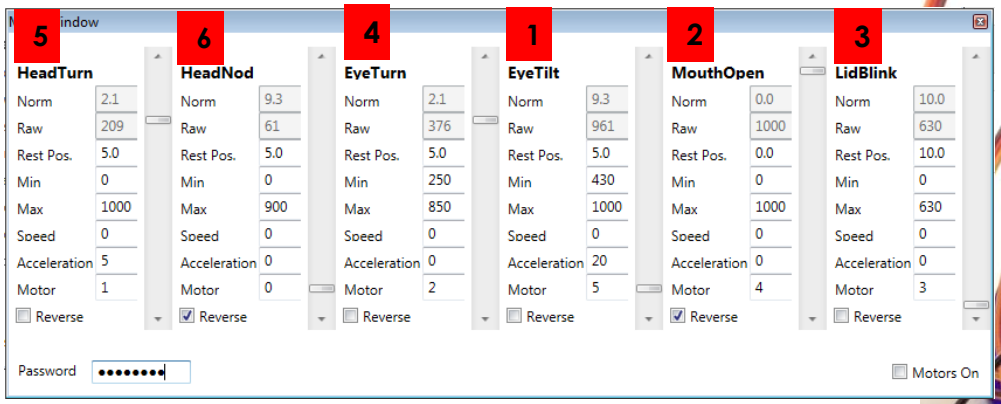


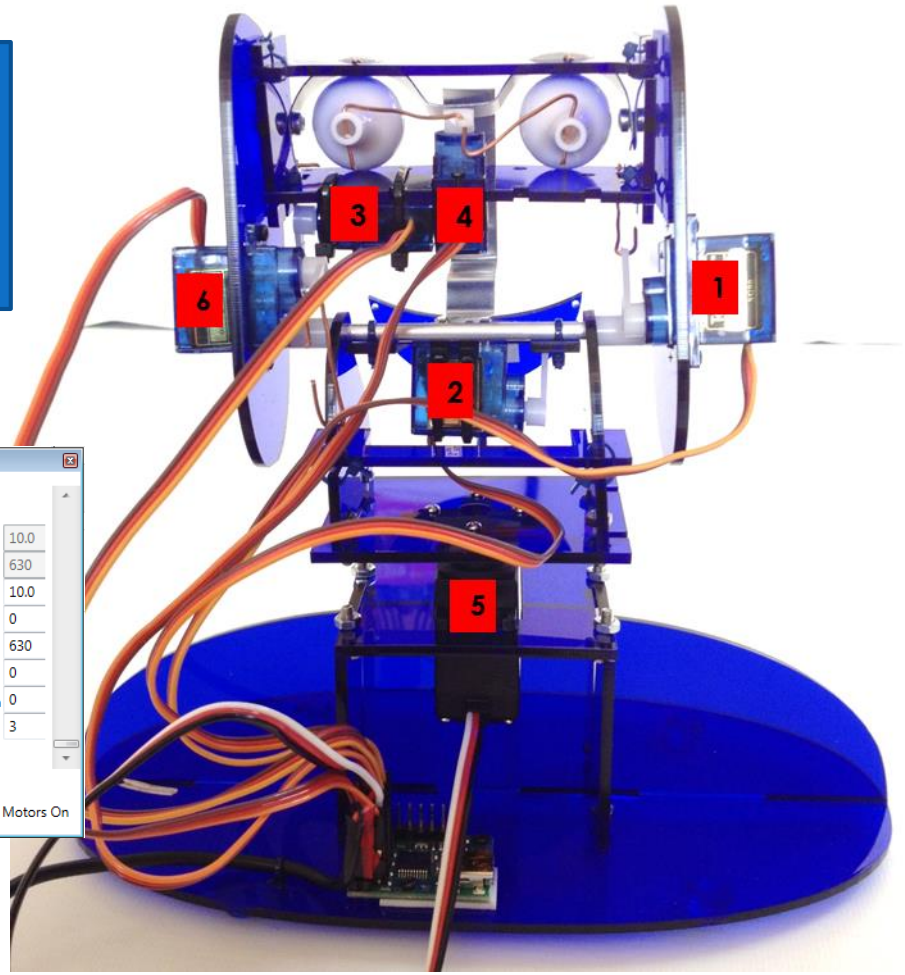
You will need:





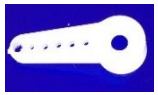
1. Run the Ohbot software
2. On the Settings menu click on Motors...
3. Enter the password- Einstein to unlock the settings dashboard
4. Without the servo arms attached check that the corresponding servo moves as you drag the slider.



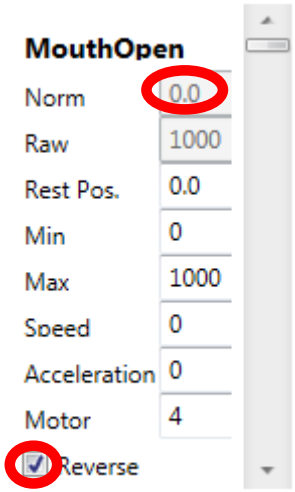


Set up mouth open (servo 2)

You will need:

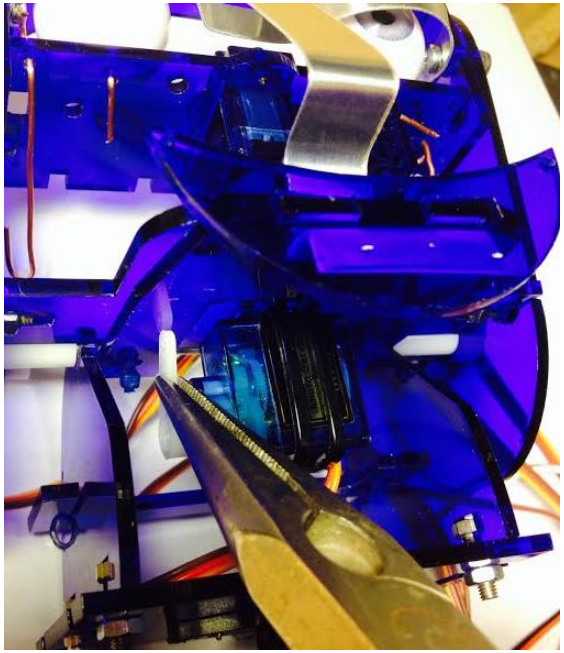


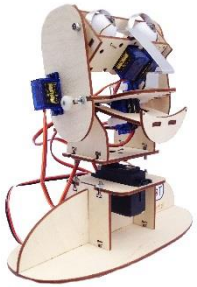
1. Adjust the MouthOpen slider until Norm reads 0.0
Ensure there is a tick in the Reverse checkbox



Warning! We recommend that you don't screw the arm on. The screw often damages the servo.

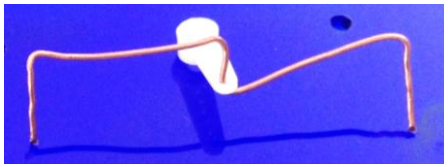
2. Use pliers to attach the arm onto the servo so that the mouth is closed with the arm pointing slightly forward



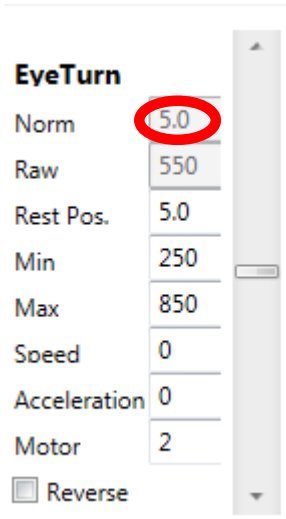


Set up eye turn (servo 4)

You will need:

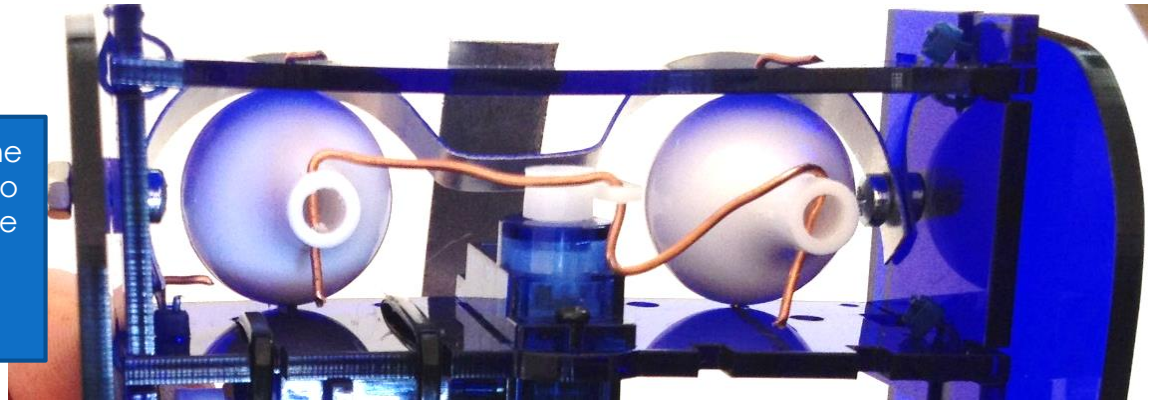


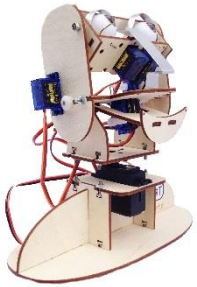
1. Adjust the slider until Norm reads 5.0



Warning! We recommend that you don't screw the arm on. The screw often damages the servo.

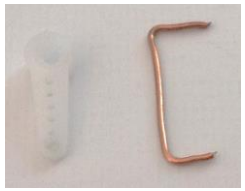
2. Attach the servo arm so the eyes are looking straight forward





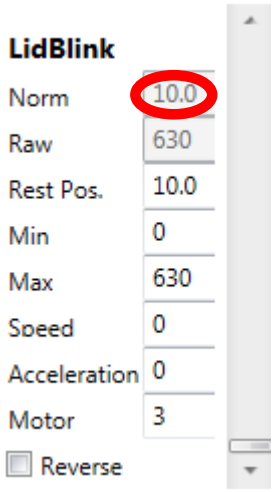
Set up lid blink (servo 3)

You will need:



pliers

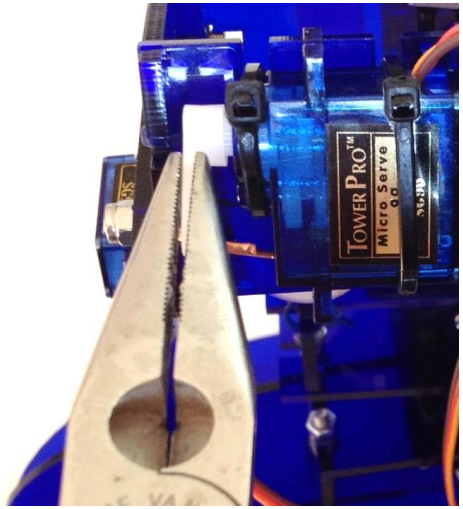
1. Adjust the LidBlink slider until Norm reads 10

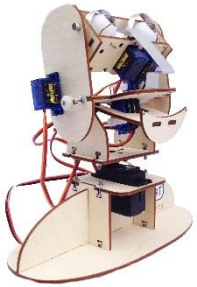


Warning! We recommend that you don't screw the arm on. The screw often damages the servo.

2. Turn the eye box so that the eyes are pointing straight down.
Bend the end of the eyelid in slightly. Put the servo wire through the hole at the bottom of the eye box. Hook the end through the hole. You may need to bend over the end of the wire and push back the end of the eyelids

3. Pull wire down to open the eyelids as far as they will go. Use pliers to attach the arm onto the servo in this position

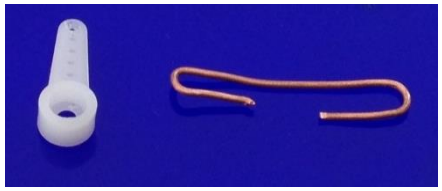




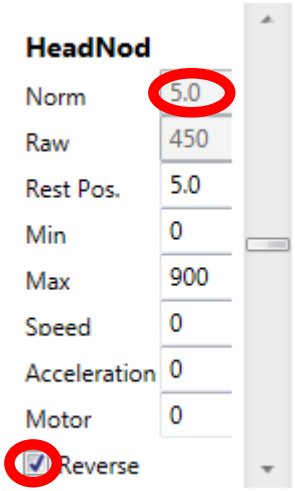
This bit is tough. If you can think of a way of making it easier let us know.

Set up head nod (servo 3)

You will need:

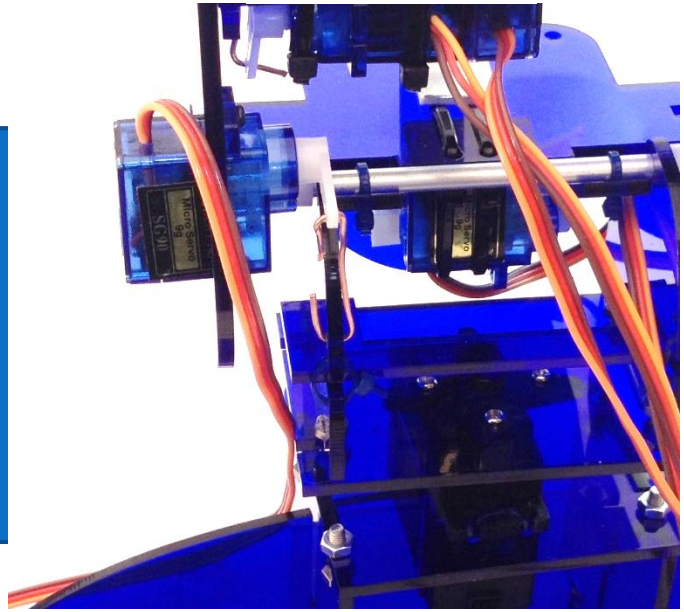


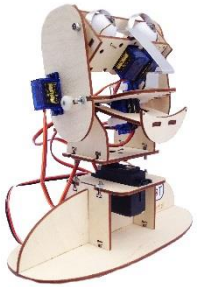
1. Adjust the HeadNod slider until Norm reads 5.0. Ensure there is a tick in the Reverse checkbox.



Warning! We recommend that you don't screw the arm on. The screw often damages the servo.

2. Thread one end of the servo wire through the hole in the neck first then attach the arm. Finally push the arm onto the servo so that the head is level, not tilted up or down.

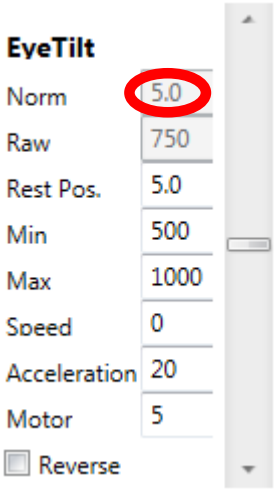




Set up eye tilt (servo 1)

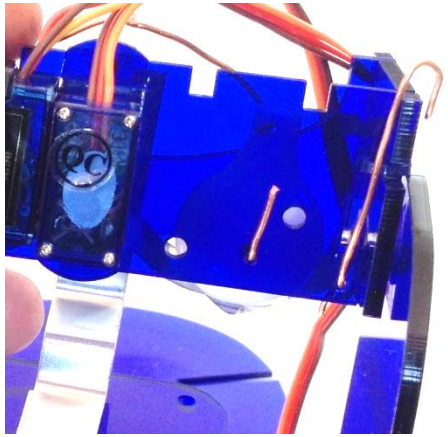
You will need:

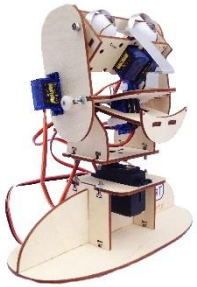
1. Adjust the EyeTilt slider until Norm reads 5.0



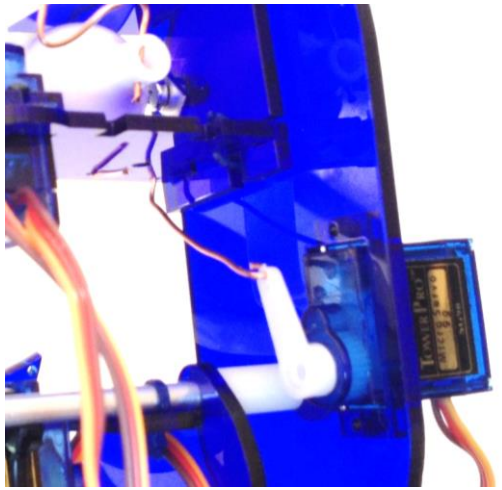
Warning! We recommend that you don't screw the arm on. The screw often damages the servo.

2. Thread the S shaped end of the servo wire into the hole at the front corner of the eye box





3. Thread the other end of the servo wire onto the servo arm. Push the servo arm onto the servo in a position that makes the eye box horizontal.



Hooray, you've made your Ohbot! Now let the programming begin…