

# PAPER PET

**Make a robotic pet that reacts wags its tail when you pet it!**

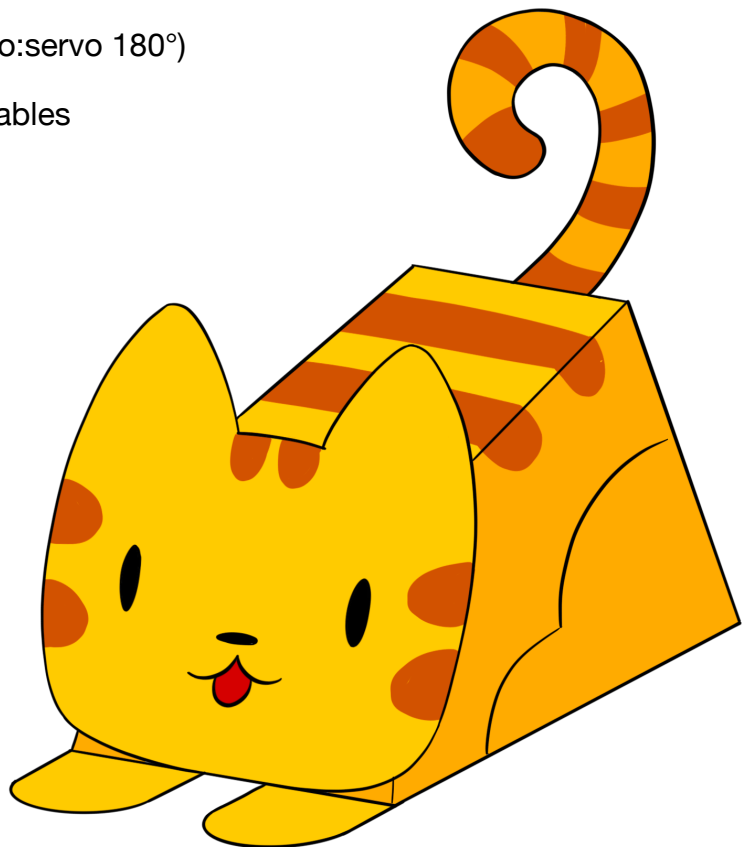
## Tools & Materials

### Included in kit:

- Paper Pet Templates  
*If you need to print new templates, you can download them here:*  
<https://www.okdo.com/p/okdo-microbit-build-a-paper-robot-kit/>
- Standard Micro Servo (EF92A, micro:servo 180°)
- 3x Crocodile to Male Jumper Pin Cables
- 1x Crocodile Cable
- micro:bit v2 Board
- Micro USB Cable

### Not included in kit:

- Tin Foil (or conductive tape)
- Computer
- Scissors or Craft Knife
- Glue
- Tape



Paper Pet templates and instructions © Jasmine Florentine 2022

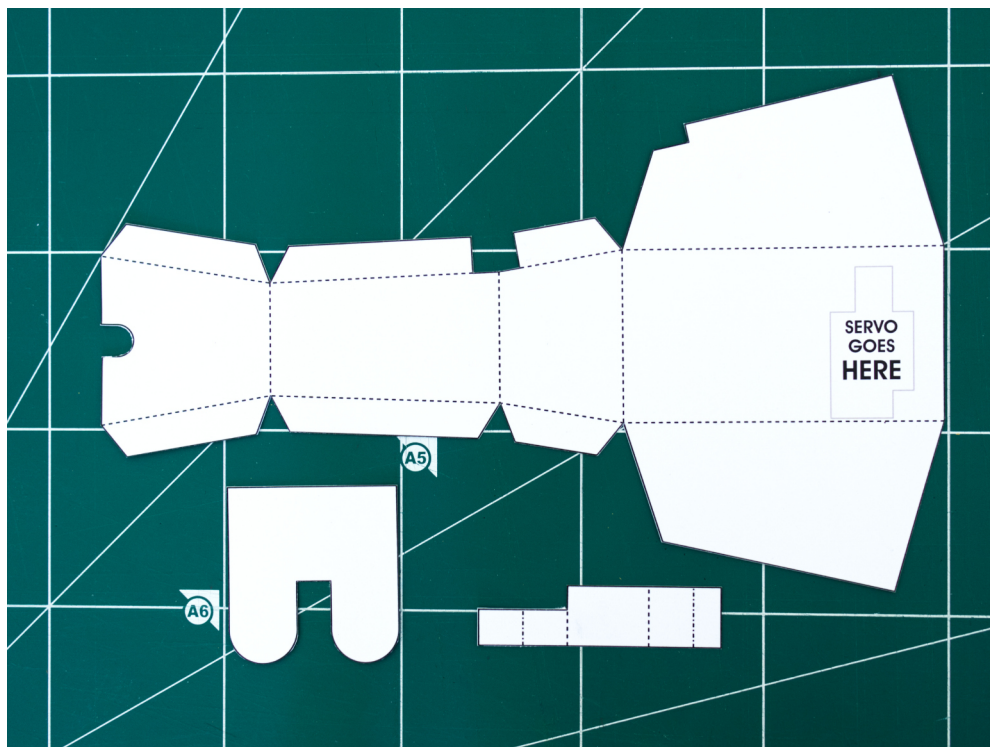
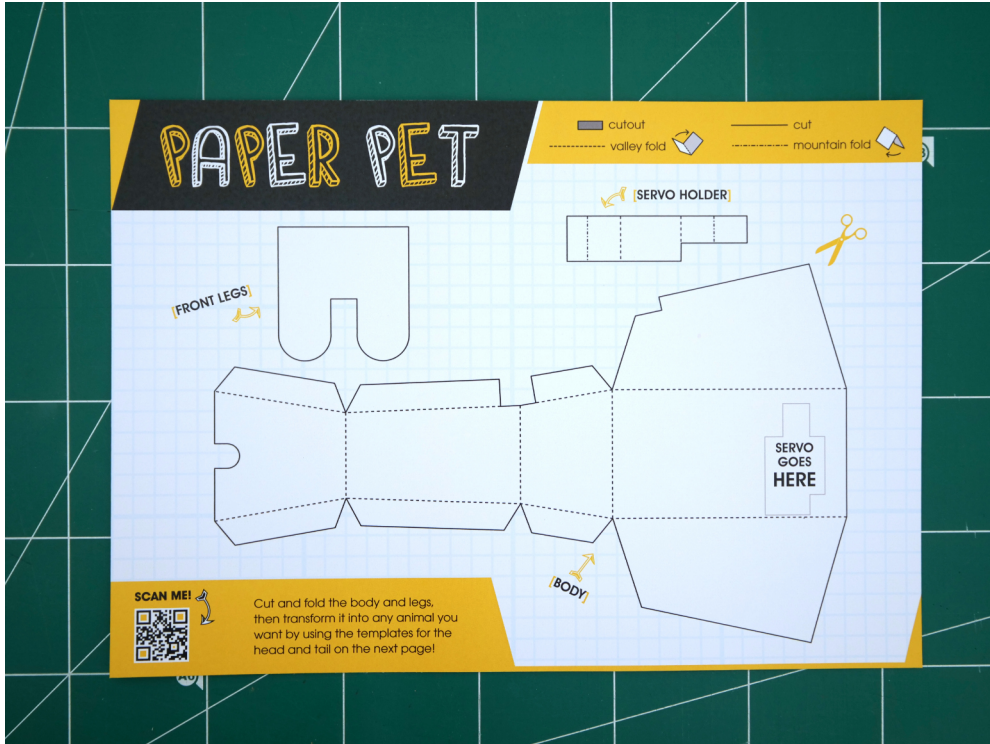
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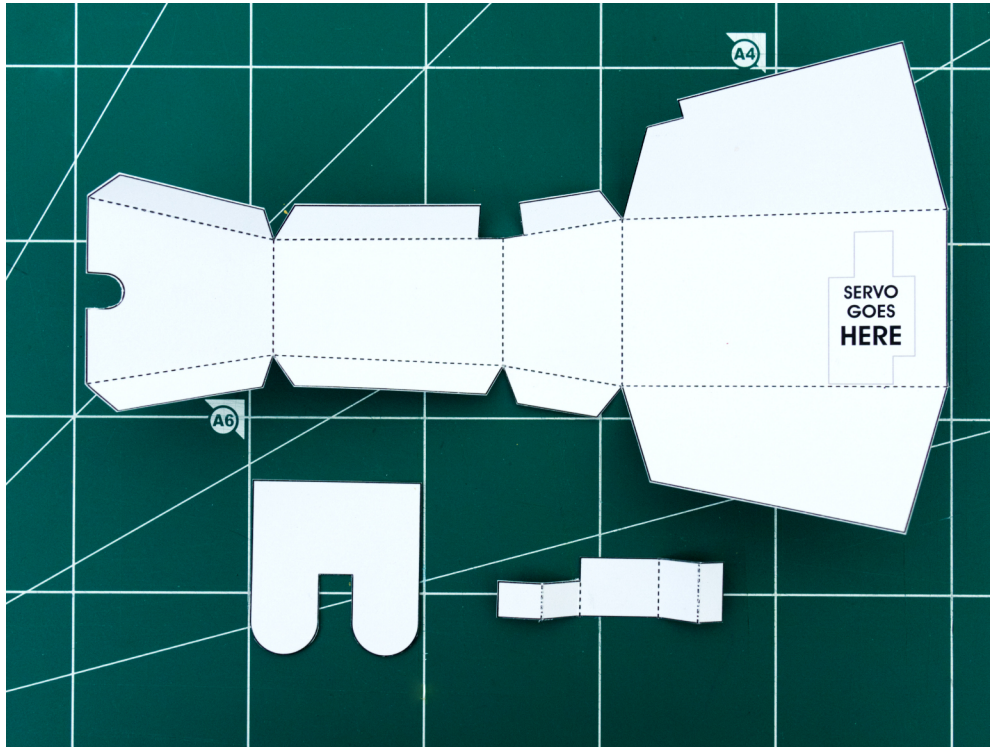
1

Start by cutting all the pieces out of first page of the template.



2

Pre-crease all the fold lines. This will make assembly easier later on.



3

You can decorate the Paper Pet when it's finished, but you might find it easier to color some of the parts while it's still disassembled. (I usually color the parts on the backside, since all the fold lines will be hidden on the inside).

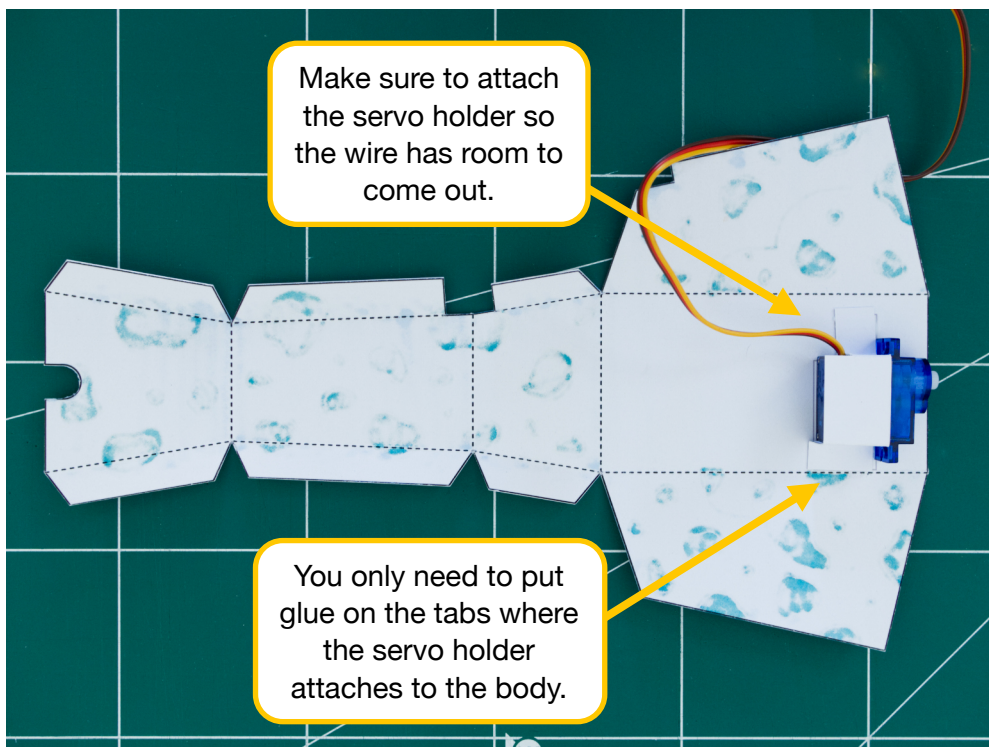
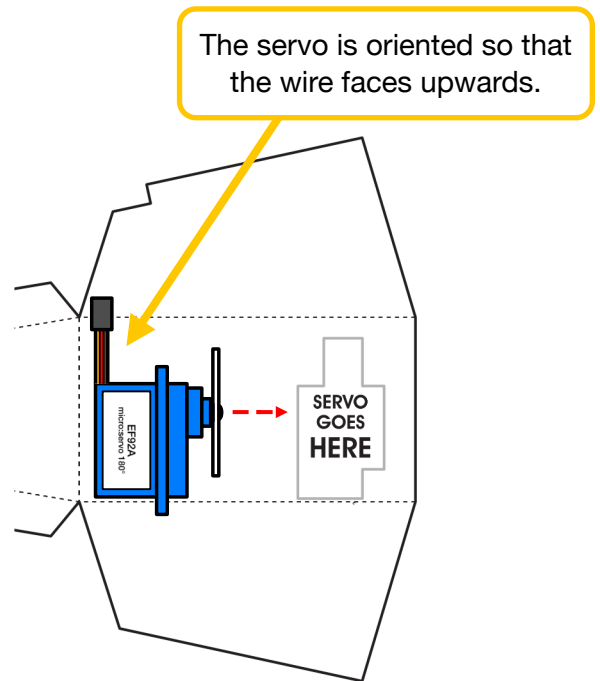
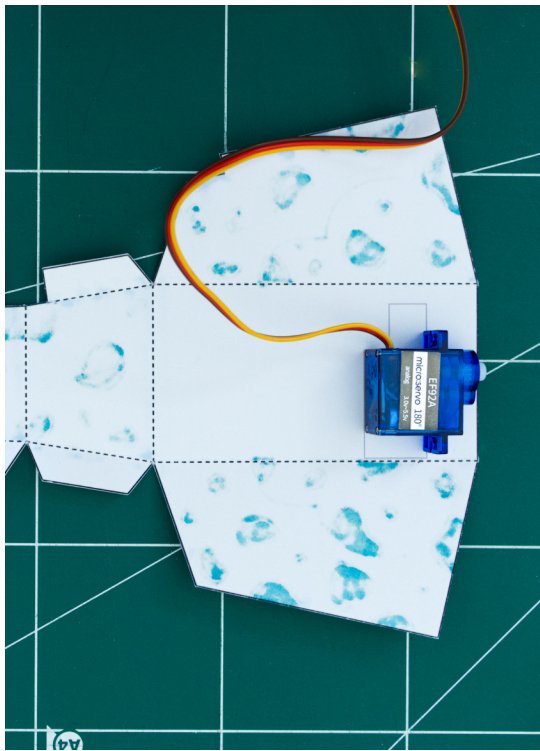


4

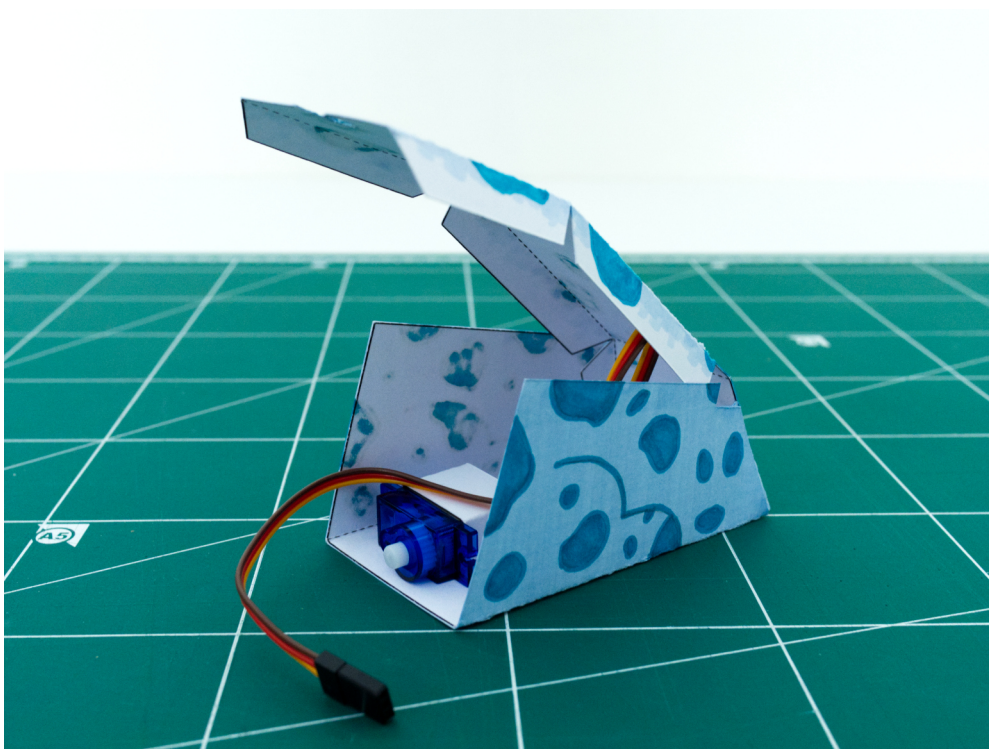
Glue or tape the servo holder around the servo and to the body where shown. You don't need to put glue on the servo itself, just on the paper tabs.

Make sure the servo is oriented with the wire coming out in the same direction as the picture below.

Note: For this project, make sure you're using the **standard 180° servo** (the one labeled EF92A).

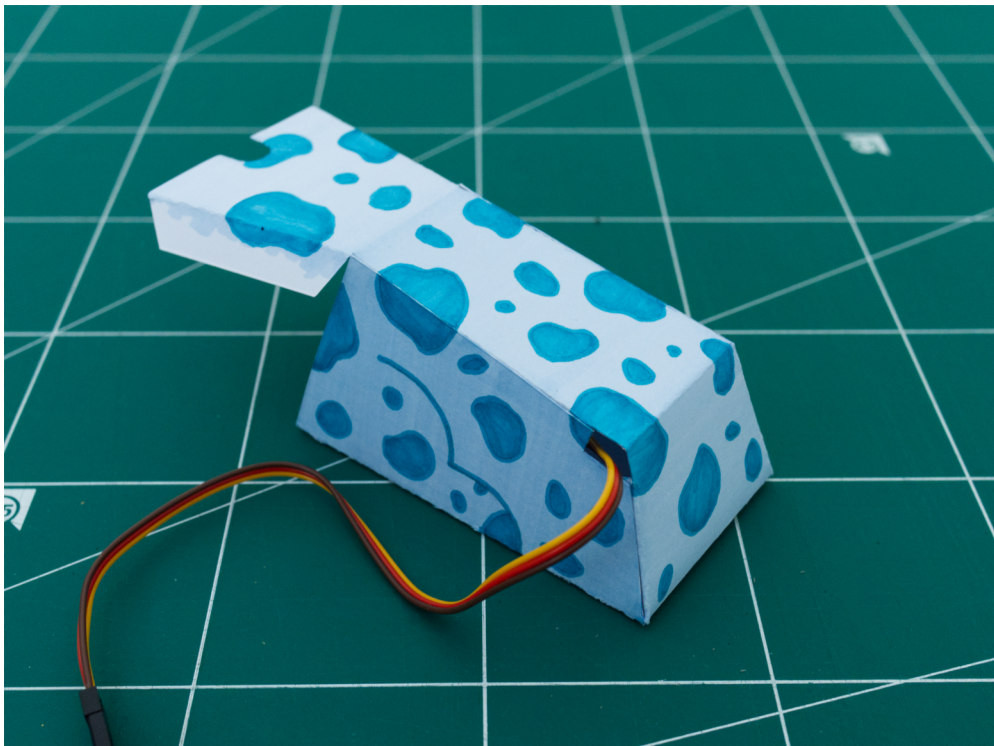
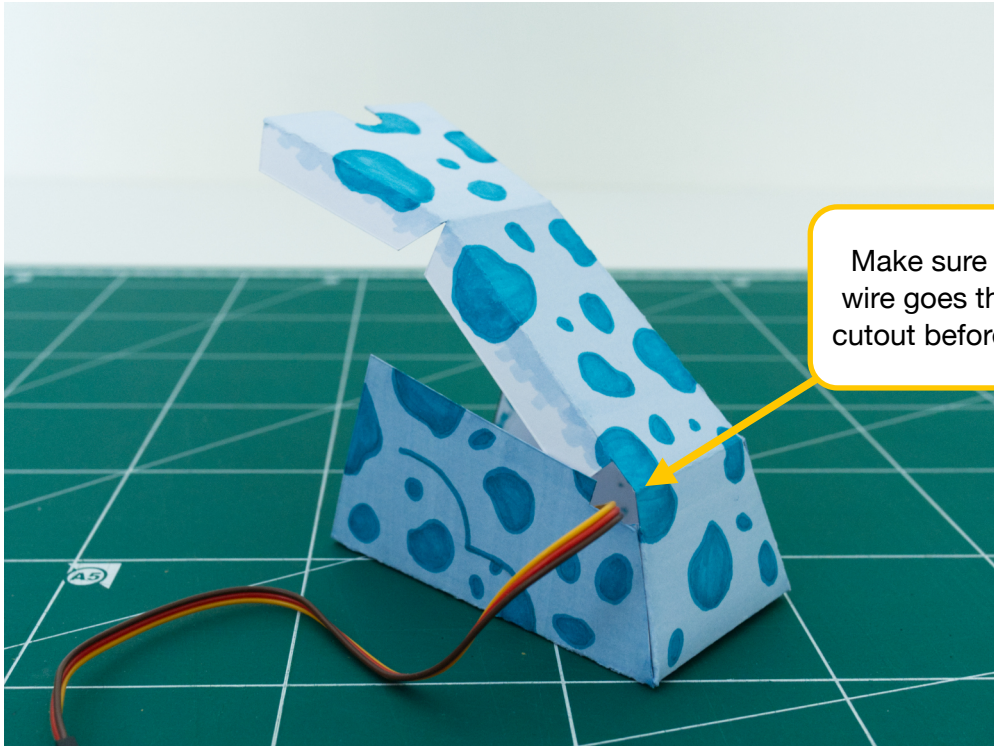


**5** Fold and glue or tape the front of the body as shown.



6

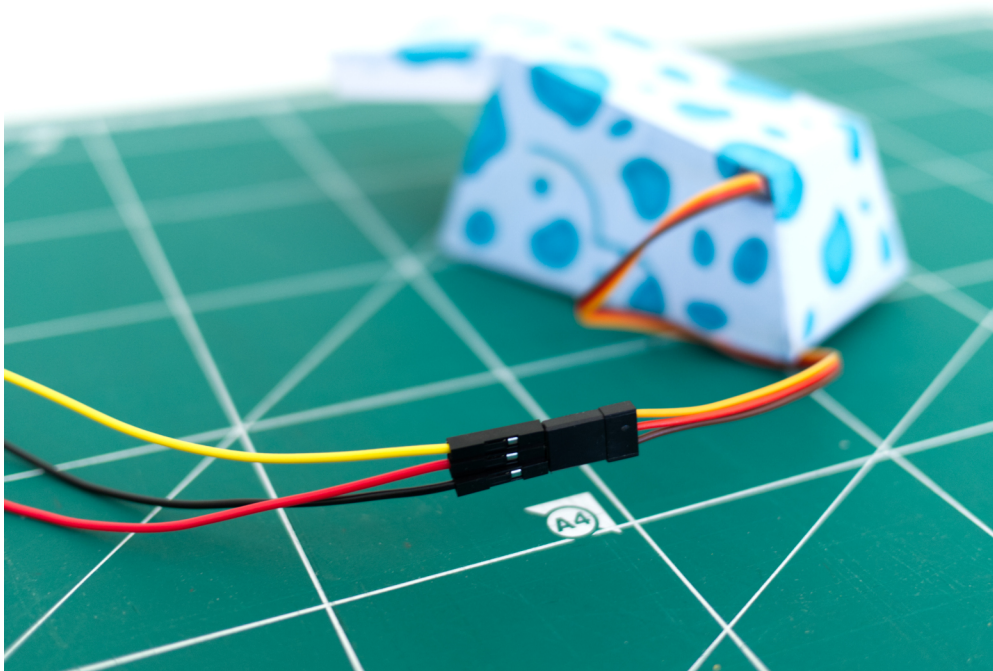
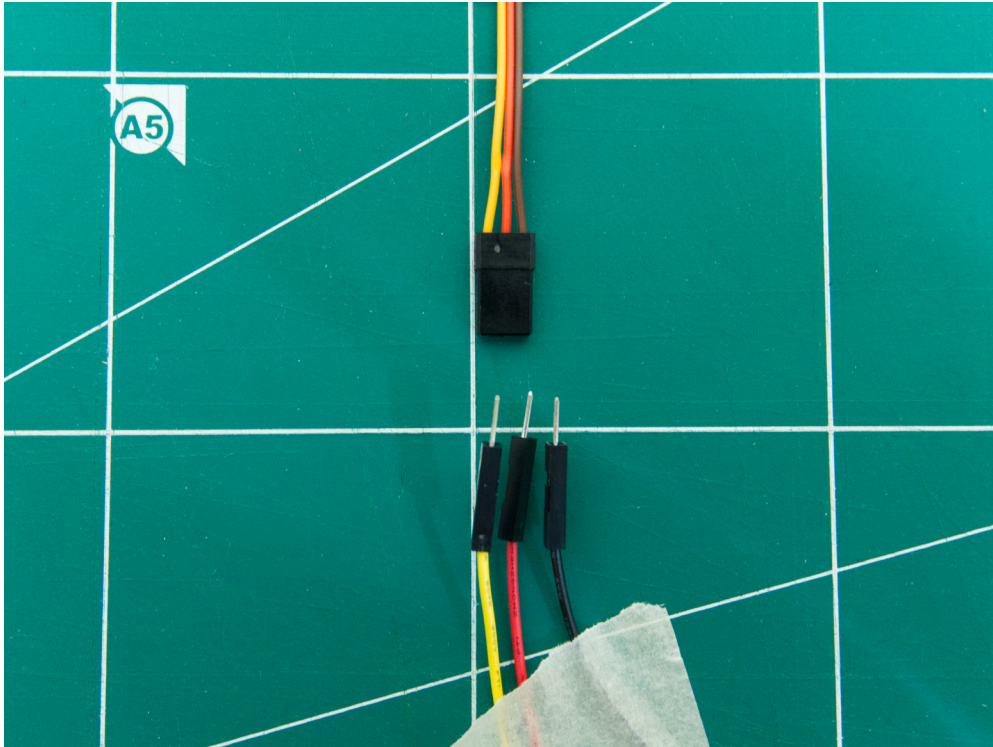
Put the servo wire through the cutout, then fold and glue (or tape) the top of the body.



7

We need to set the angle of the servo before we finish making the rest of the body. To do that, we'll need to connect the electronics and program the micro:bit.

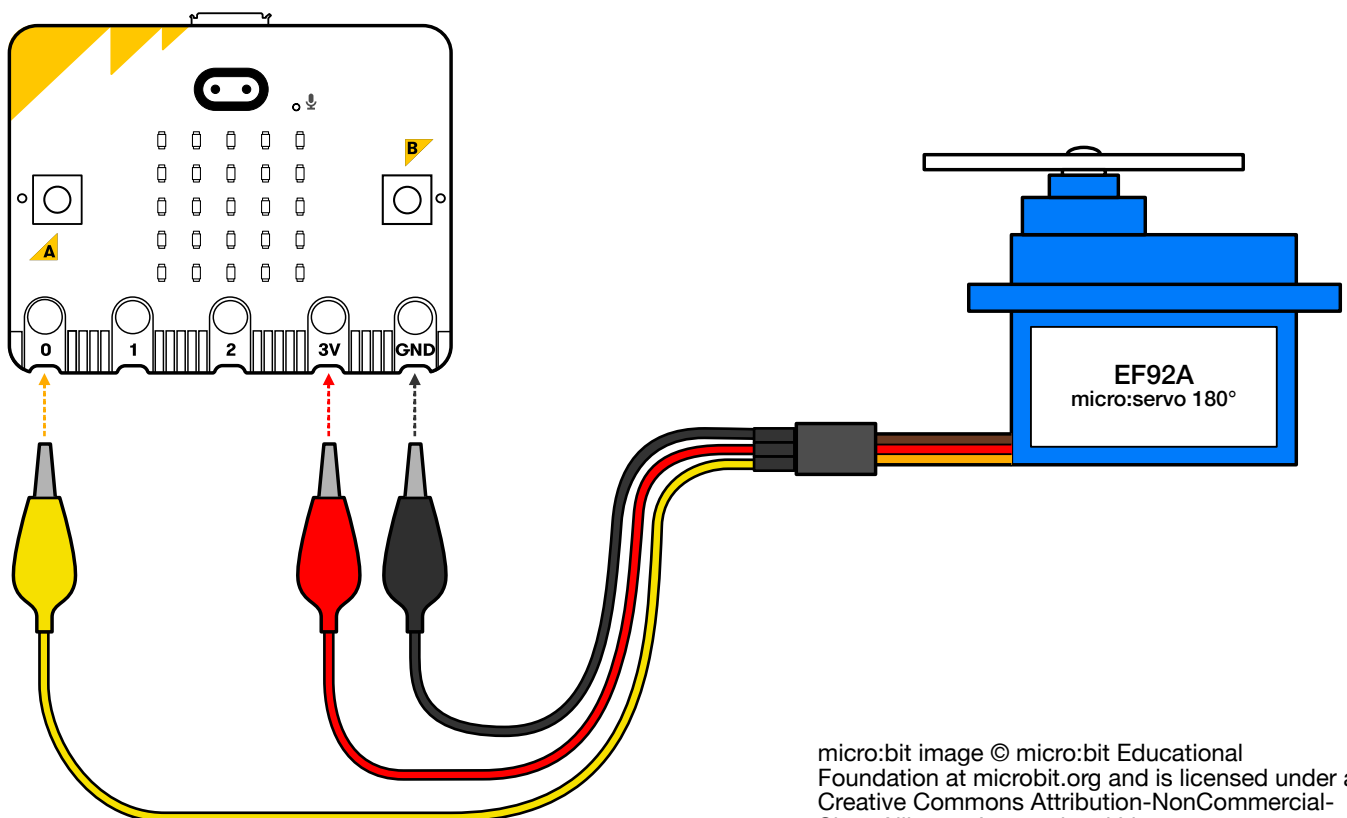
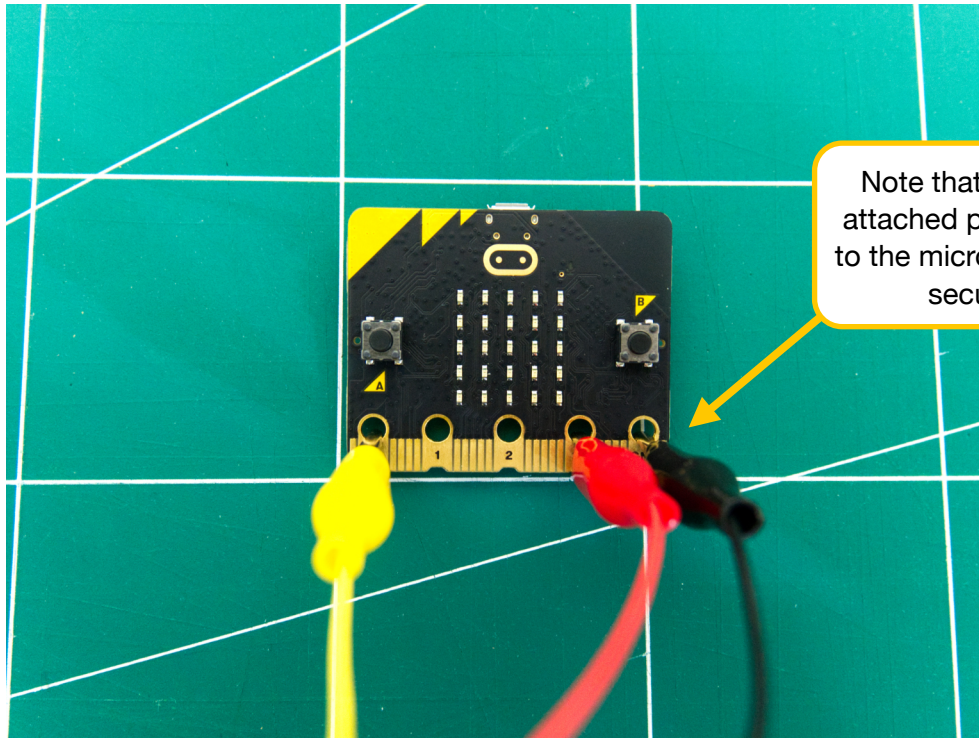
Connect 3 of the the crocodile to male jumper pin cables to the servo header. You can use any color of crocodile cables, but if you match the color of the servo wires to the crocodile cables, it will make it much easier to keep track of the connections.



8

Connect the crocodile clips to the micro:bit. Make sure that they are connected as follows:

- Crocodile clip connected to the YELLOW servo wire → micro:bit Pin 0
- Crocodile clip connected to the RED servo wire → micro:bit 3V
- Crocodile clip connected to the BROWN servo wire → micro:bit GND

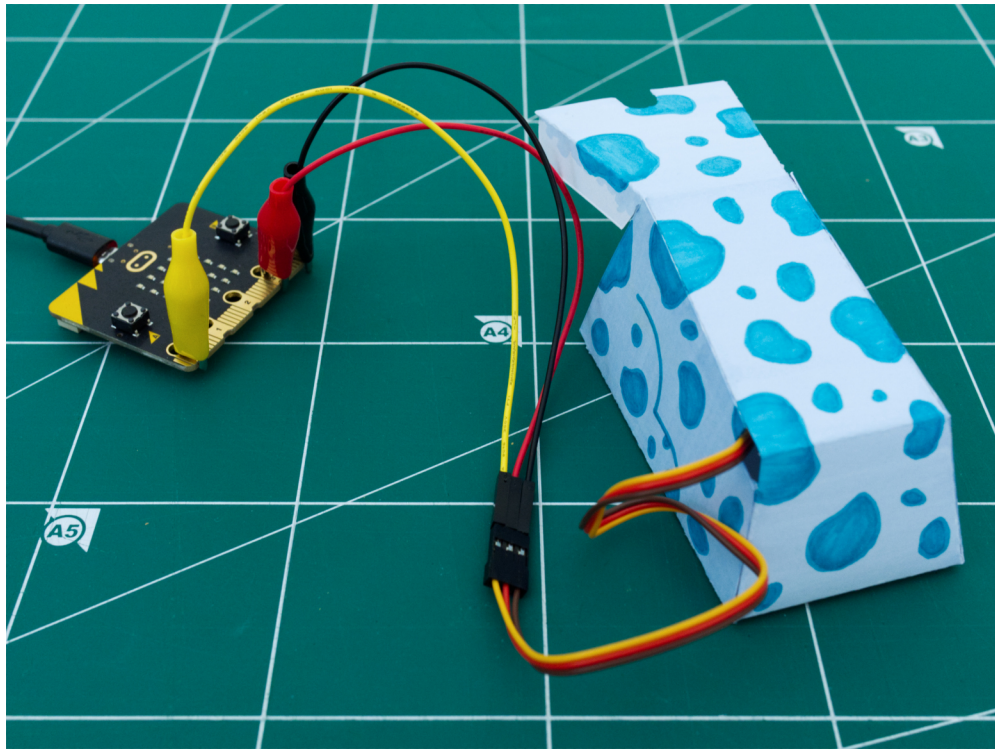


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9

The servo is now connected! Next, you'll need to transfer the code to the micro:bit.



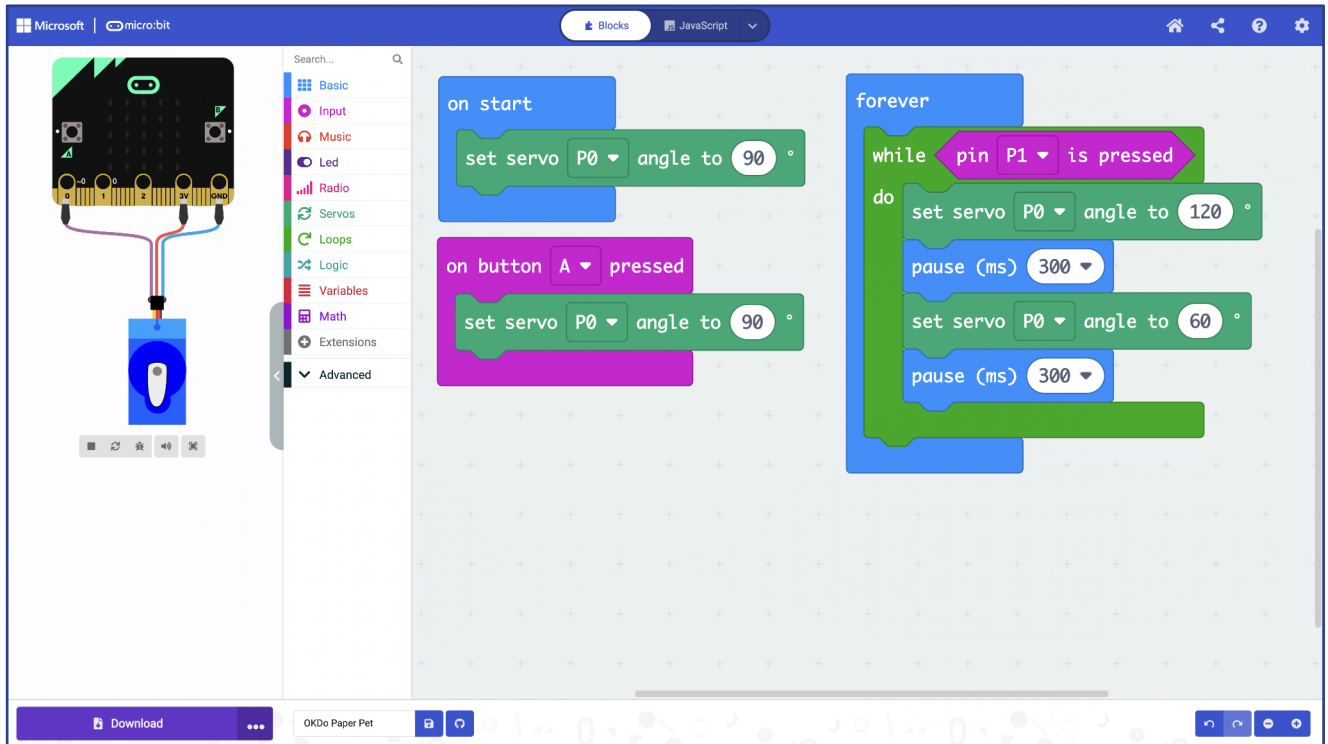
**10**

Connect the micro:bit to your computer using the micro USB cord. The cord will be used both to transfer the code and to supply power to the micro:bit and the servo.

**11**

Get the code from here:

[https://makecode.microbit.org/#pub:\\_0pCMDyUtd9Cr](https://makecode.microbit.org/#pub:_0pCMDyUtd9Cr)

**12**

Upload the code to the micro:bit using the following instructions (choose in the instructions what type of computer and browser you're using for more specific directions):

<https://microbit.org/get-started/first-steps/set-up/>

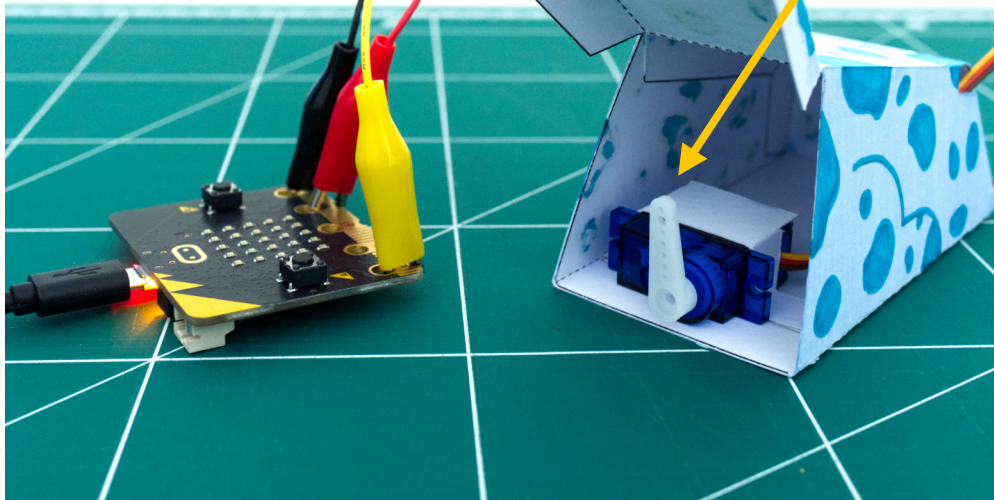
or

<https://makecode.microbit.org/device/usb>

13

With the electronics connected, press the A button to center the servo's position. That way, when you attach the tail, it will start at the right position and won't get caught at some weird angle. I've attached the servo horn to better see the angle, but you don't have to.

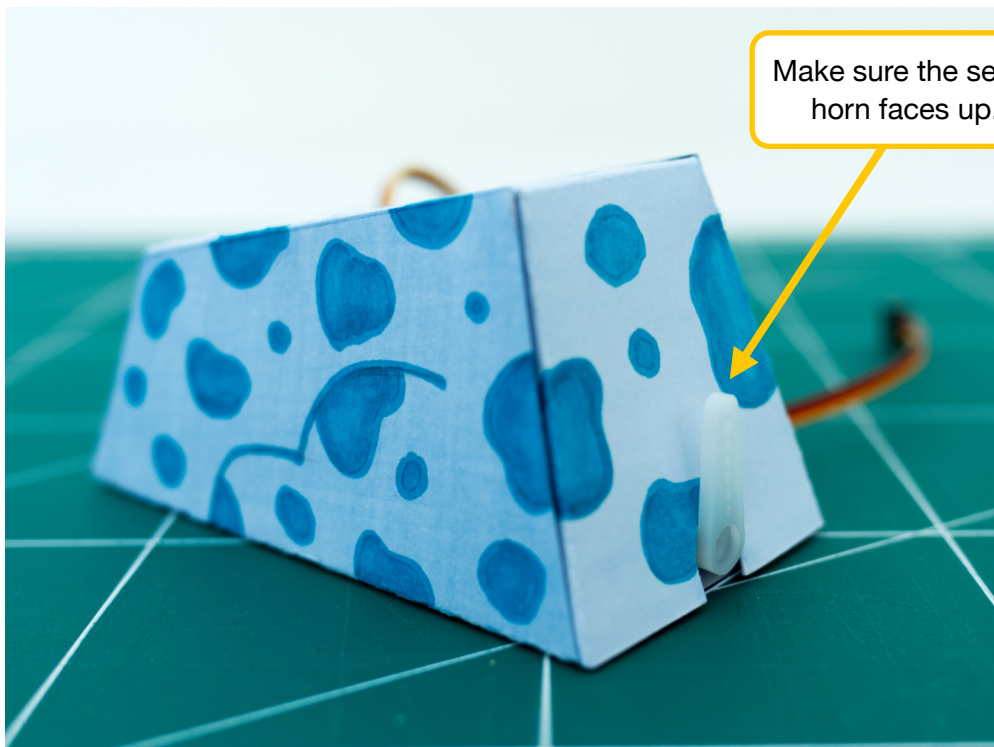
Make sure to use this shape of servo horn for this project.



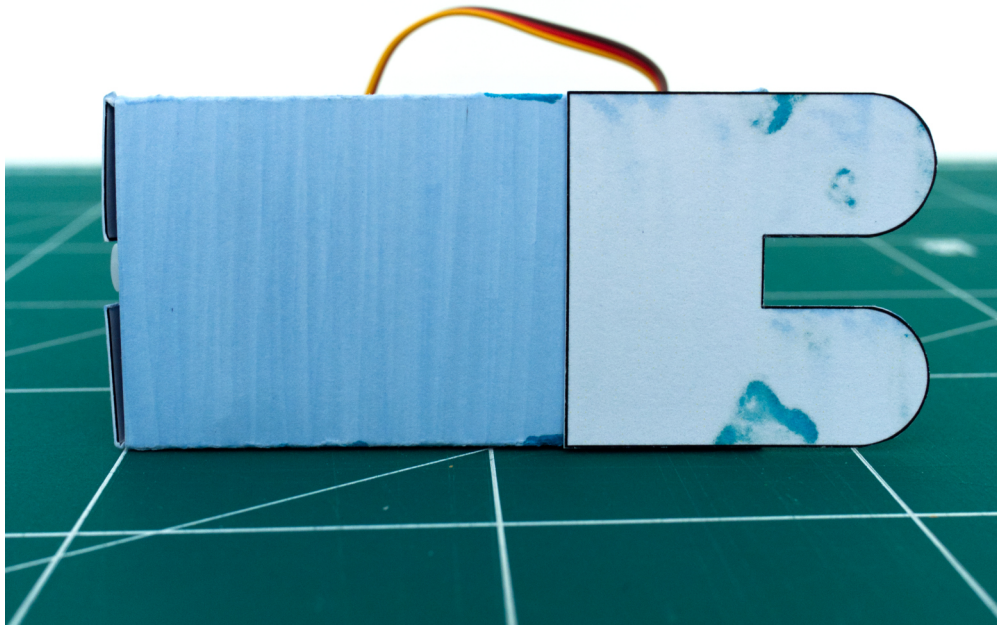
14

Remove the servo horn, fold the back of the body in, and then put the servo horn back on at the same angle (facing upward as shown). The servo horn should hold the back of the body closed even without glue or tape.

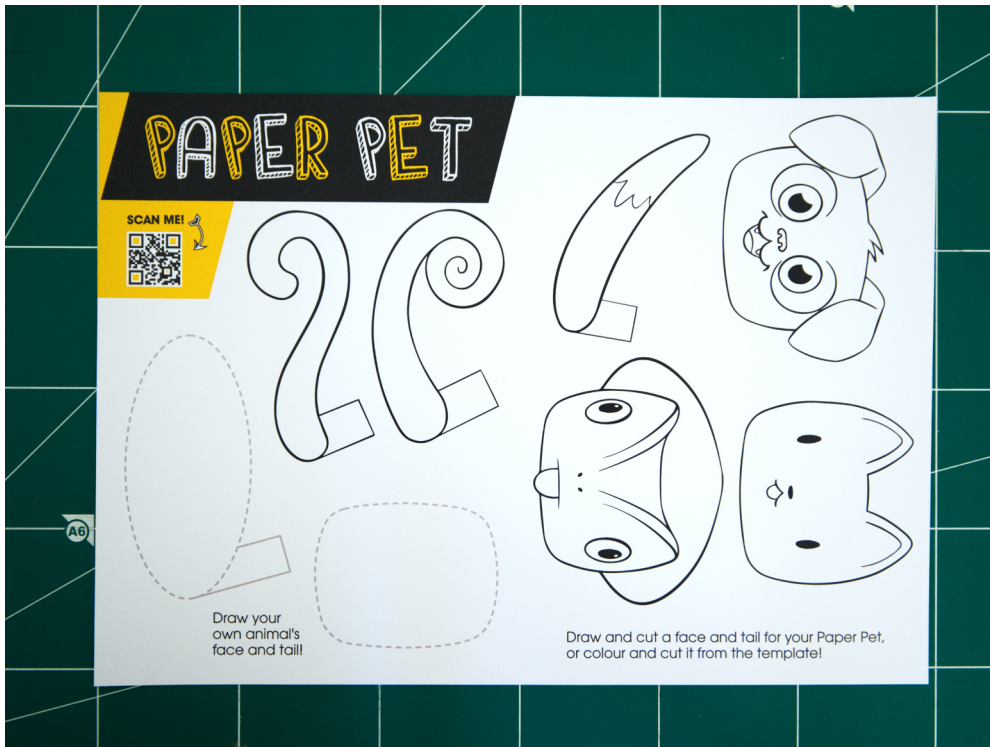
Make sure the servo horn faces up.



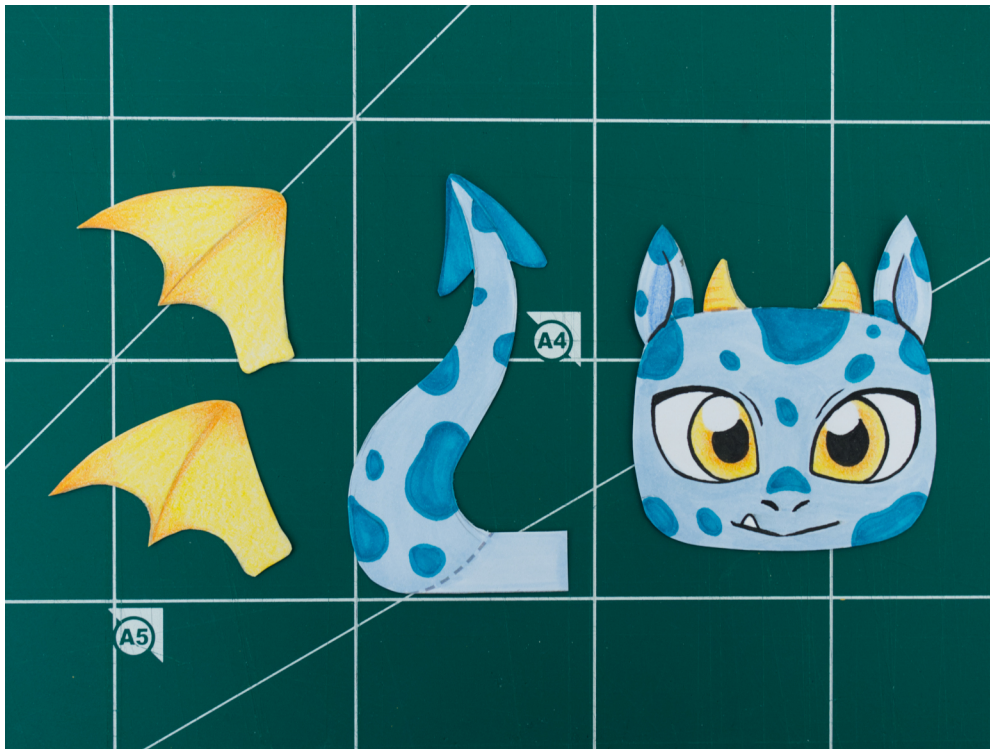
**15** Glue legs onto the body. You can unplug the servo in the meantime.



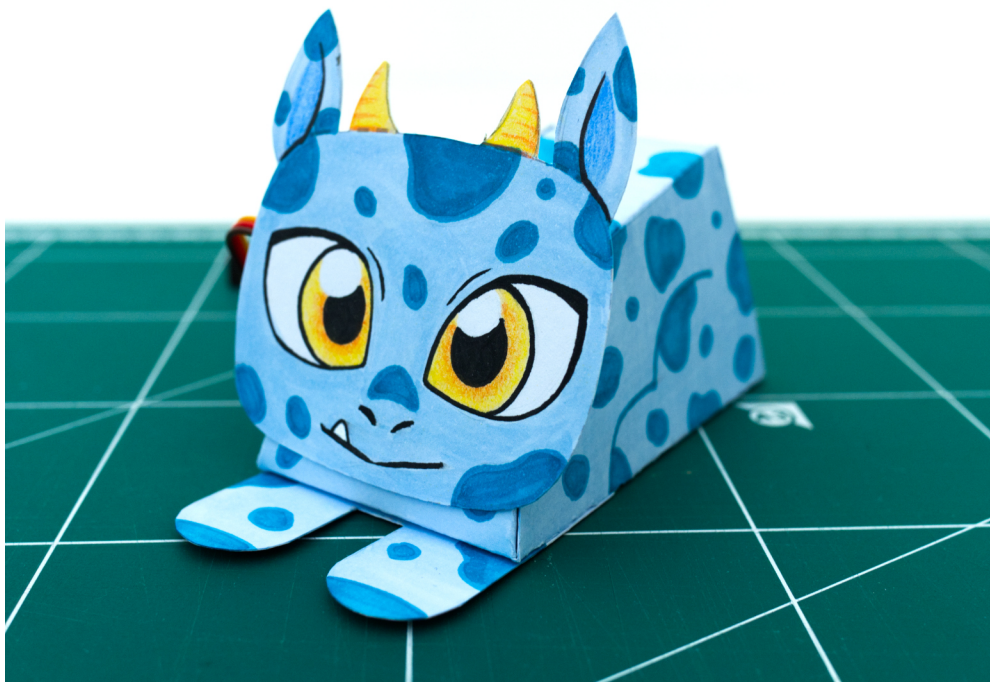
Give your Paper Pet a face and tail! You can draw your own face and tail or use the provided template. I decided to draw and color my own for this tutorial.



**17** Cut out the face and tail. I also decided to give my Paper Pet wings.



**18** Glue or tape the face onto the front of the body.

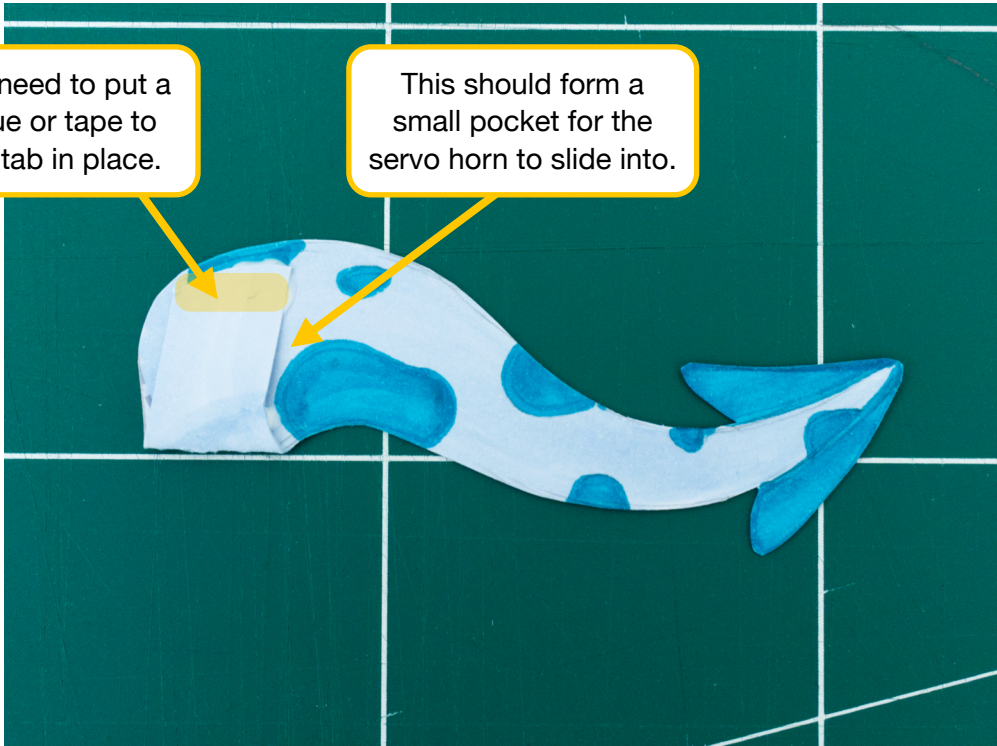


19

Fold the tab on the tail over (and trim if necessary). Put a tiny bit of glue just on the end of the tab to form a pocket. If you use tape, make sure to only seal the tab closed on the end so you can slide the tail onto the servo horn.

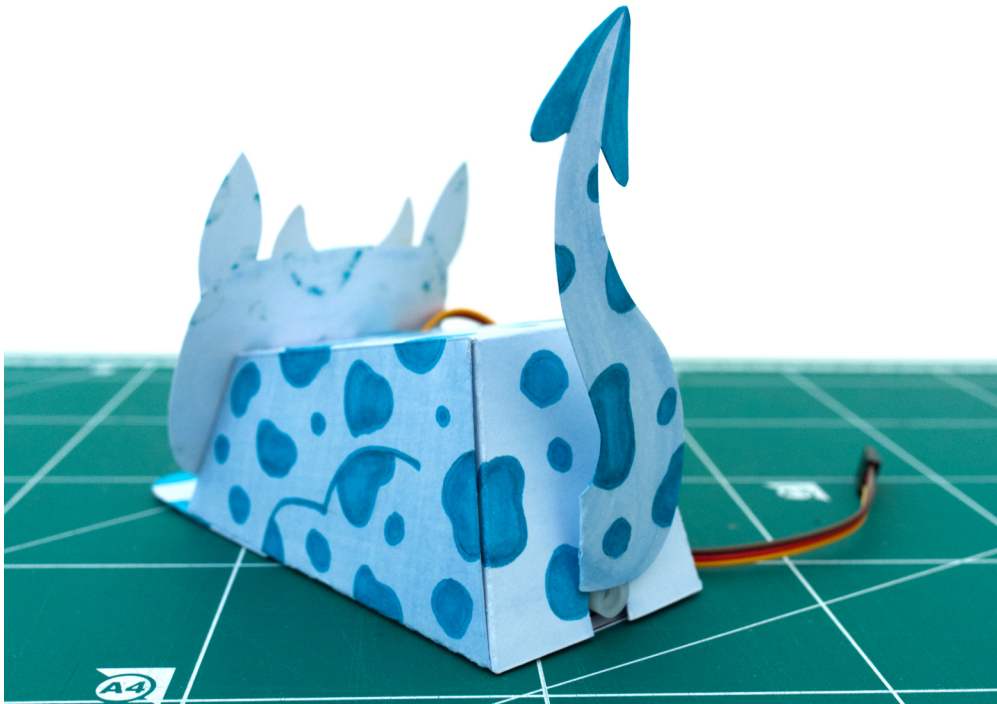
You only need to put a bit of glue or tape to hold the tab in place.

This should form a small pocket for the servo horn to slide into.

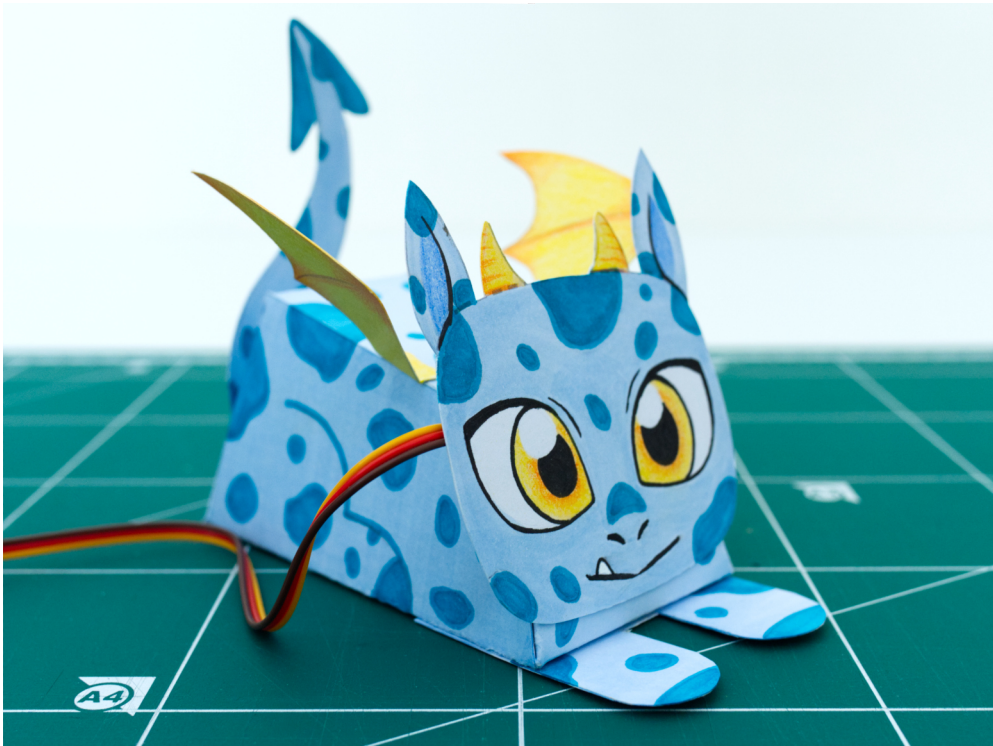


20

Slide the tail onto the servo horn by using the tab you just made.



**21** Glue or tape on any other decorations. I glued wings onto my Paper Pet.



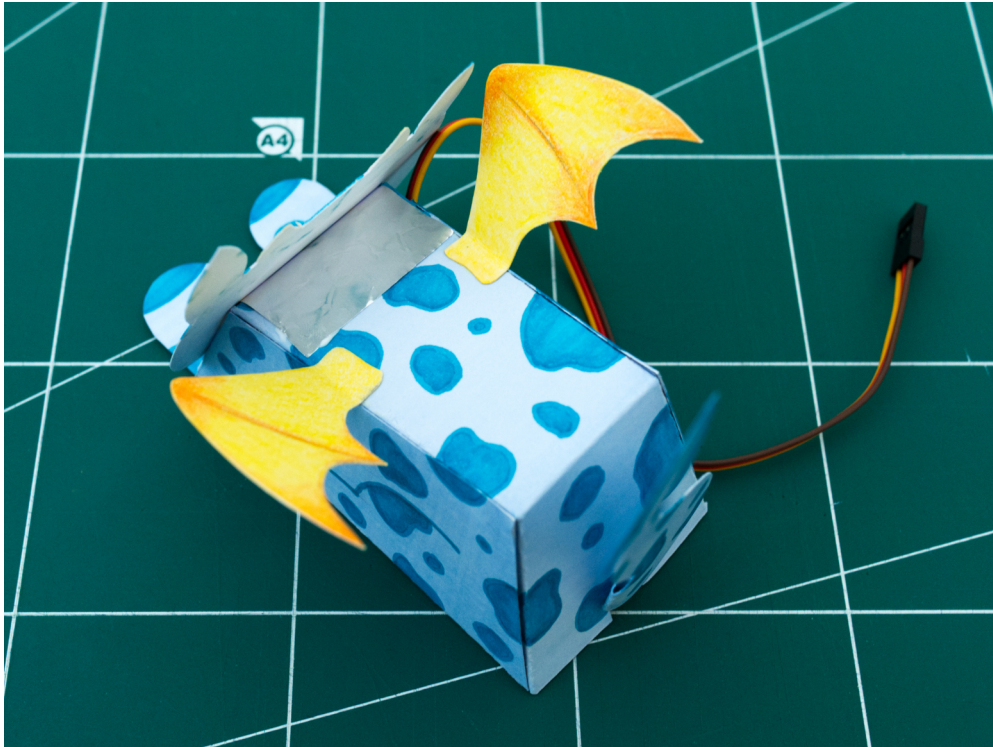
**22** Cut a small piece of tin foil, around 3.5 centimeters by 2 centimeters.





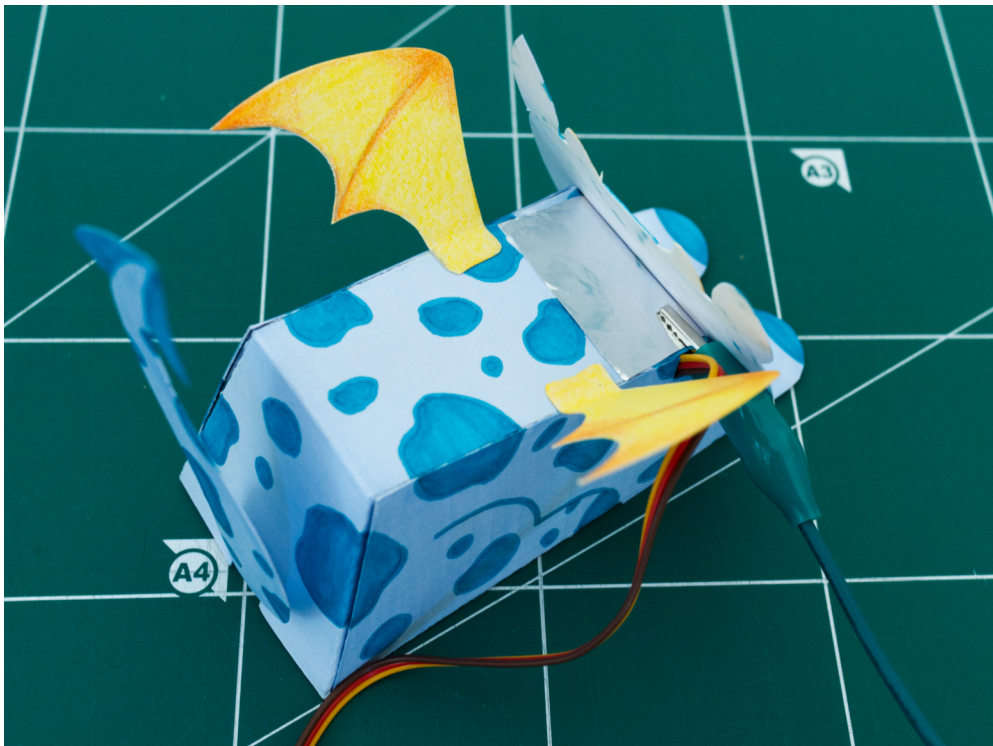
**23**

Glue the tin foil to the bottom of the leg (you can also use conductive tape instead of tin foil).

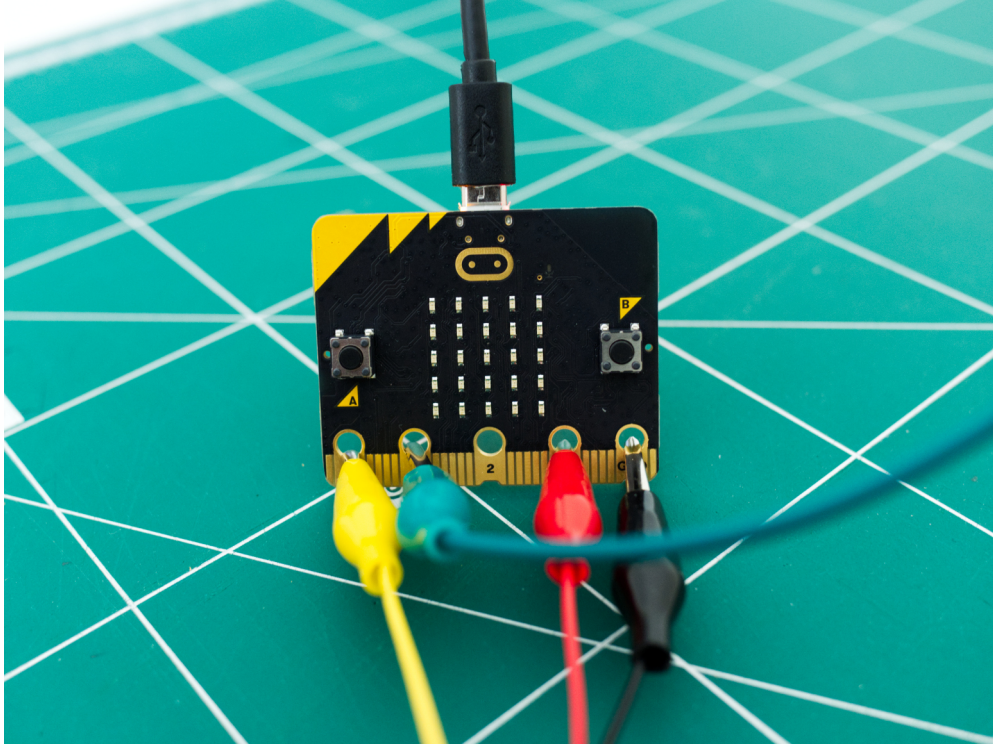


**24**

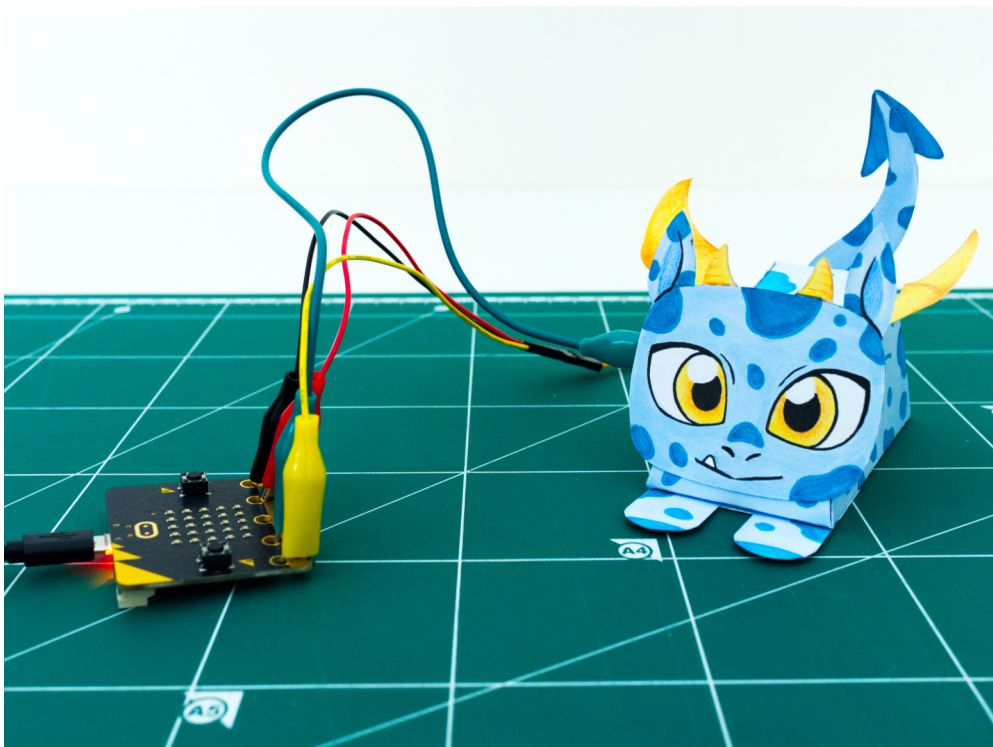
Connect one end of the crocodile clip to through the same cutout as the servo wire so that it touches the tin foil.



**25** Connect the other end of the crocodile clip to the micro:bit at Pin 1.



**26** Reconnect the servo if you disconnected it earlier.



27

Test it out! Pet the Paper Pet's back where the tin foil is to make its tail wag! Here's a video of it in action: <https://youtu.be/6XajYJ6iuwg>



28

Experiment! Can you make the Paper Pet more interactive by programming in other inputs and outputs? Check out micro:bit's tutorial for making a Virtual Pet for inspiration: <https://microbit.org/projects/make-it-code-it/microbit-pet/>