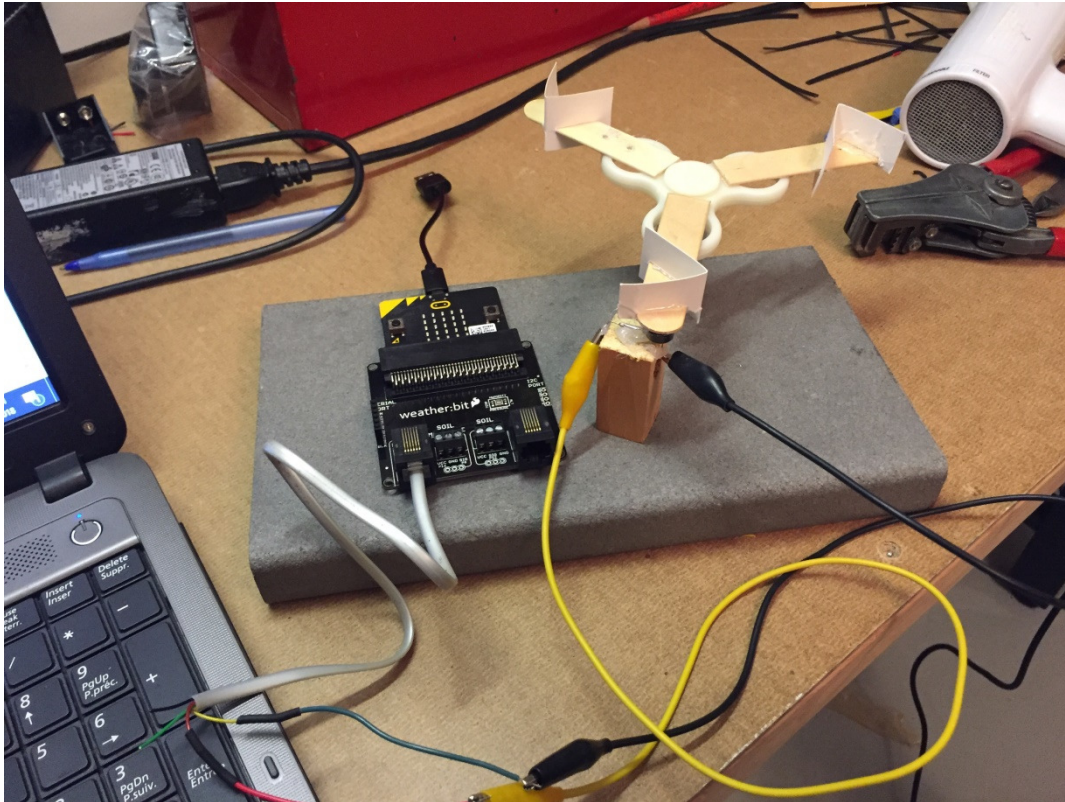


## Building a Wind Speed Indicator (anemometer) to use with the Sparkfun weather:bit module

You can build your own wind speed indicator from items typically found around the house. Then you can connect it to the Sparkfun weather:bit module and measure windspeed in km/h.



Video is here: <https://www.youtube.com/watch?v=E4UcnOYKTbA>

### Parts List:

- Some scrap wood or other material for the base of your indicator
- Short piece of plastic pipe for the post for the indicator
- Old telephone cord with RJ11 plug
- Small fridge magnet (the stronger the better)
- A fidget spinner
- Some popsicle sticks or tongue depressors
- Some light cardboard for the vanes
- Hot glue gun or other adhesive to glue wood and plastic
- A magnetic reed switch (get a few, they're easy to break)
- BBC micro:bit
- Sparkfun weather:bit module
- Two alligator clip cables



## Construction Steps

1. Collect your parts on a clean well-lit work surface.



Reed switch

2. Cut the sticks into 7cm lengths using a utility knife or small saw.





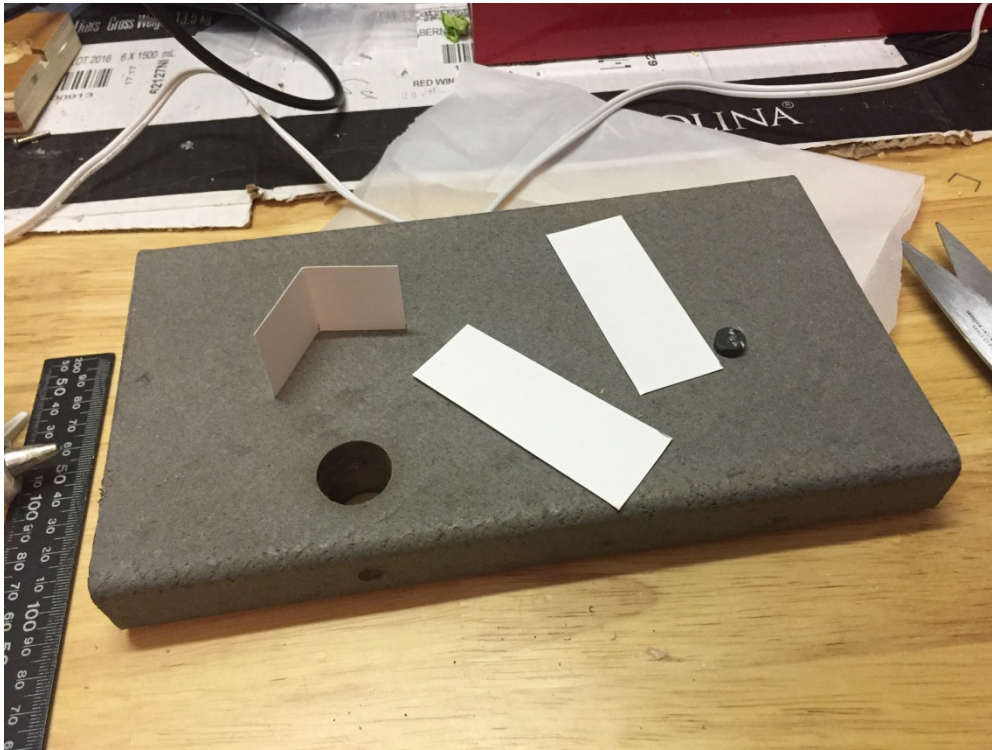
3. Remove the weights from the arms of the fidget spinner. Then glue the sticks to the fidget spinner. Don't get glue on the spinning mechanism.



At this point, cut a short length of  $\frac{3}{4}$ " pipe (or other material and glue it to the underside of the fidget spinner. This is the post for the spinner.



- Cut 3 pieces of thin cardboard approximately 2.5cm by 6cm each. Fold them in half as the piece on the left of the picture.



- With the utility knife, carefully cut slots in each piece of cardboard. You will slide these pieces onto the end of each stick. They will be the 'vanes'.

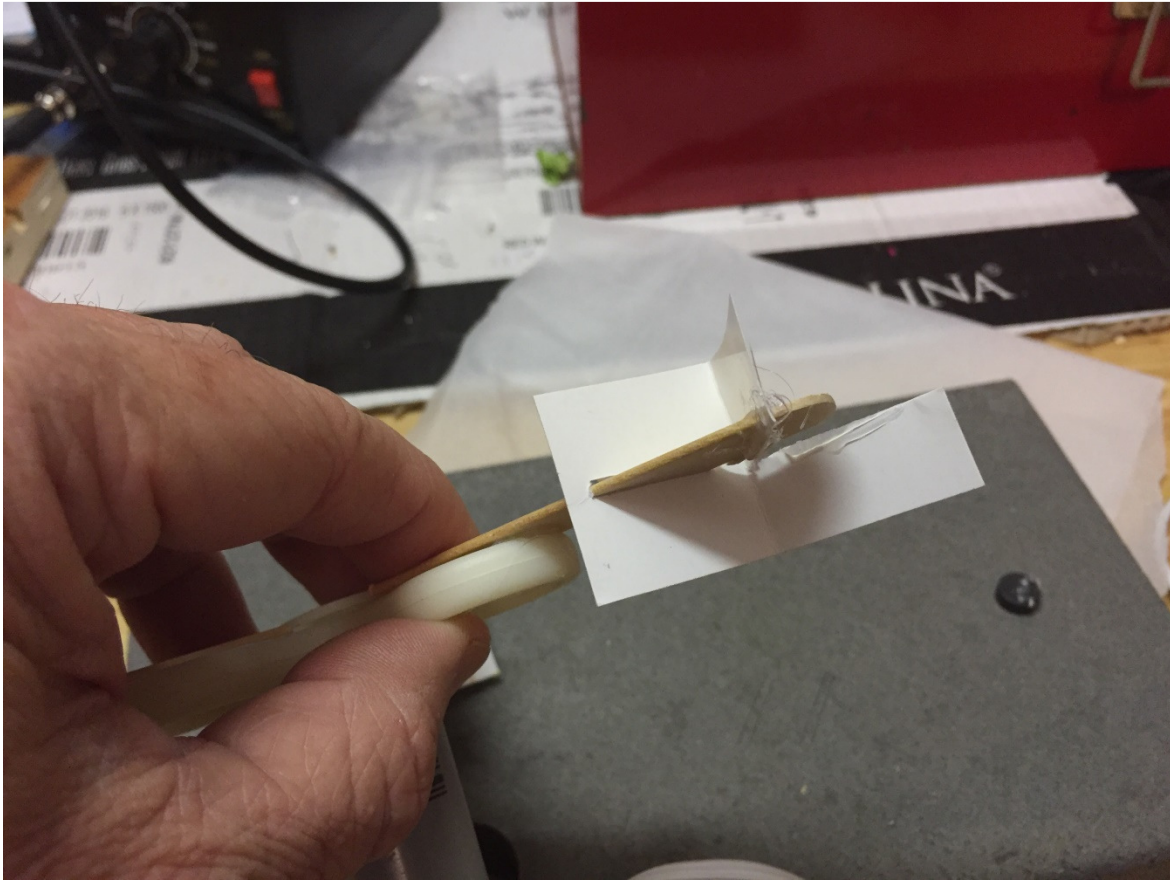




6. Mount each vane on a stick and glue in place as shown.



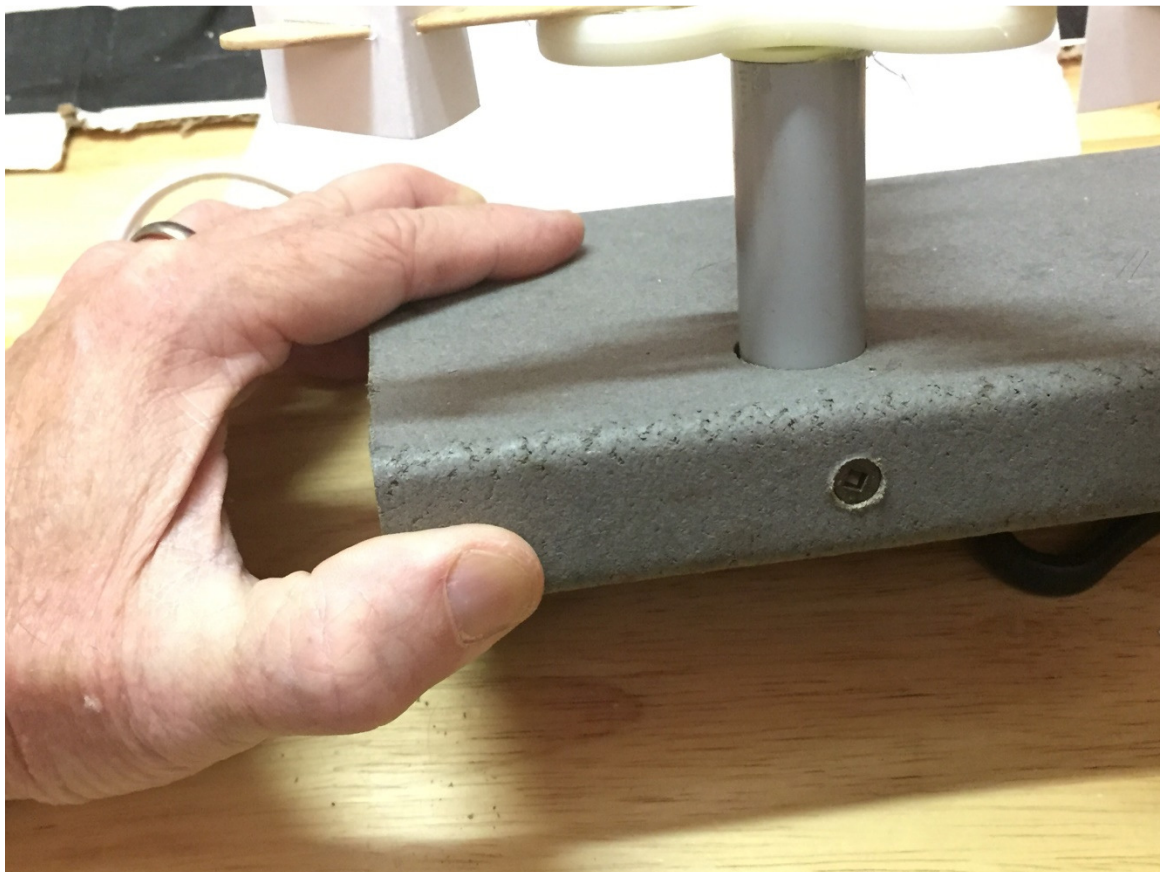
7. On the bottom outside of each vane, carefully cut and remove the flap from underneath each stick. You need to do this so the vanes will clear the reed switch that measures rotation of the device.



8. Underneath one of the vanes, glue the magnet.

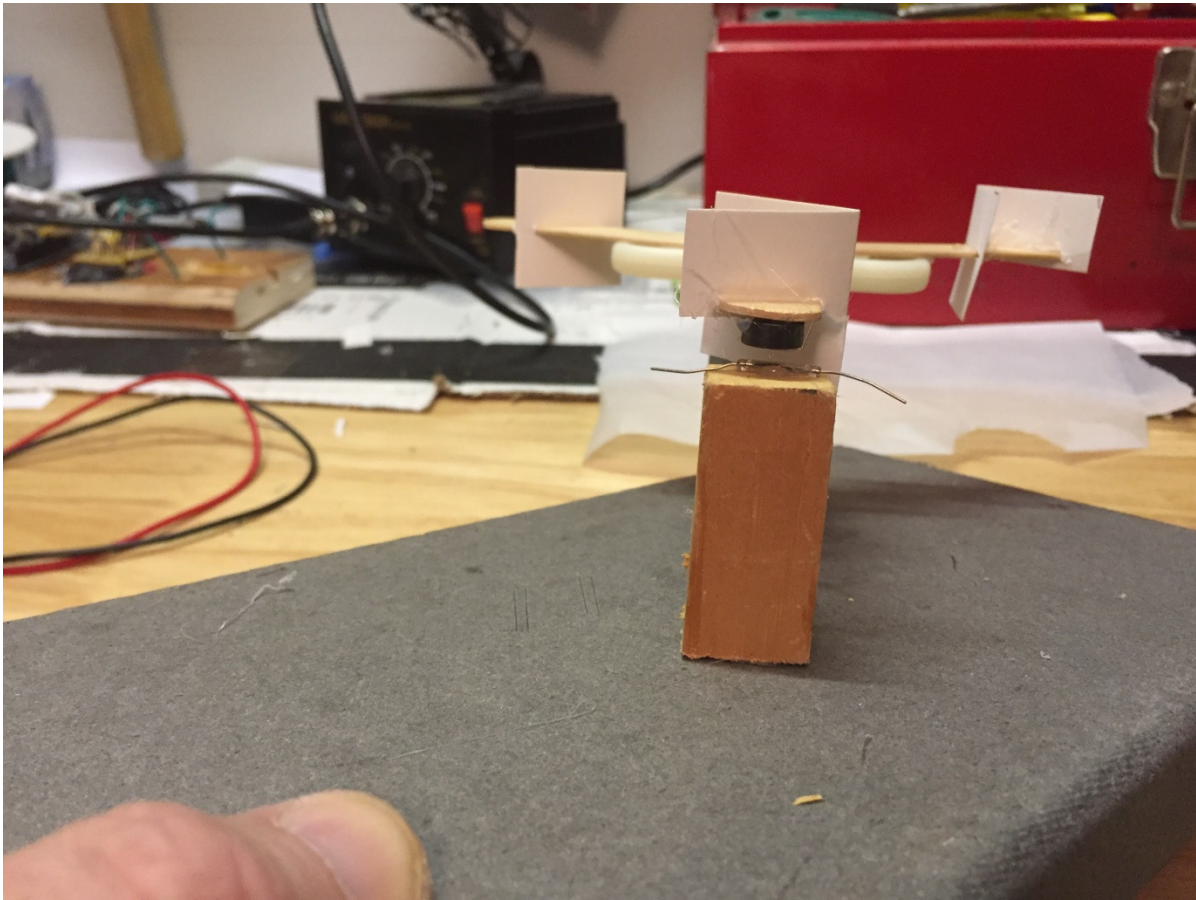


9. Mount the post in/on the base. Measure the distance from the underside of the magnet to the base.





10. Subtract about 5mm from the measurement in step 9. Cut a small piece of wood or other material that will fit under the magnet and mount to the base. This will hold the reed switch.



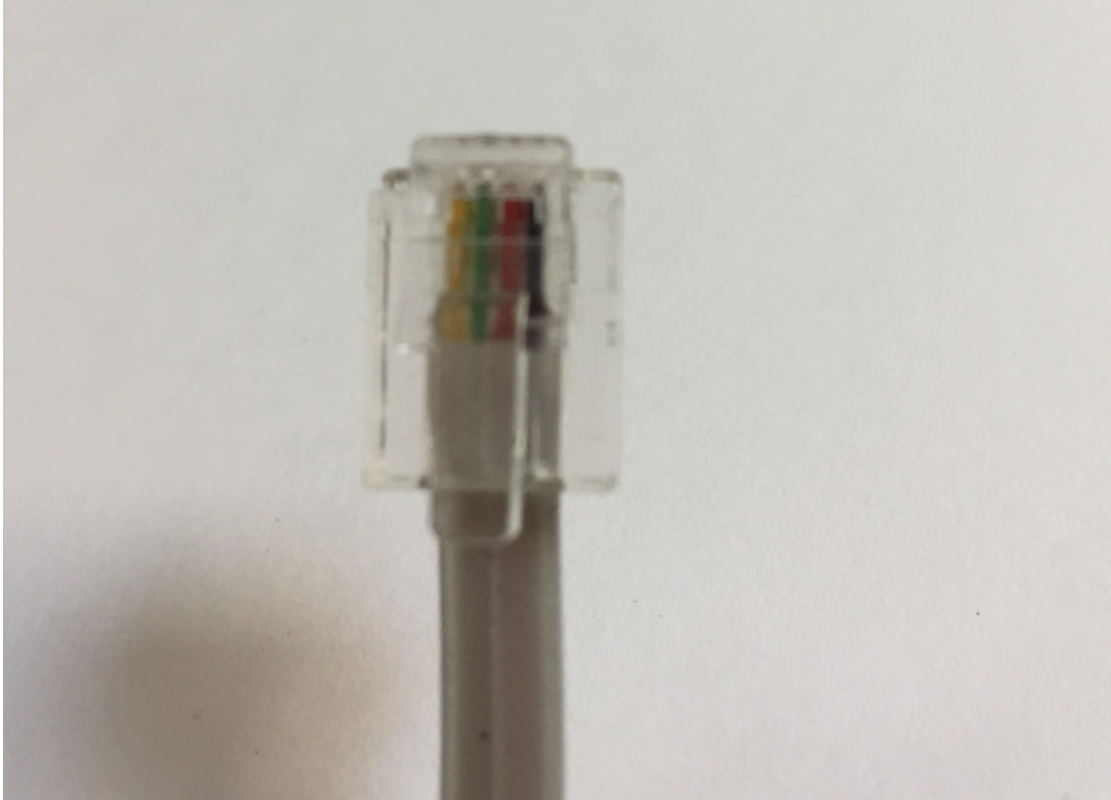
**CAREFULLY** glue the reed switch to the piece of wood. It should be mounted so the surfaces inside the switch are parallel to the base. Glue the piece of wood to the base so it's underneath the magnet. Make sure the magnet clears the switch as it passes by.

**CAREFULLY** bend the wires on the ends of the switch down slightly. The alligator clips will connect to these wires.

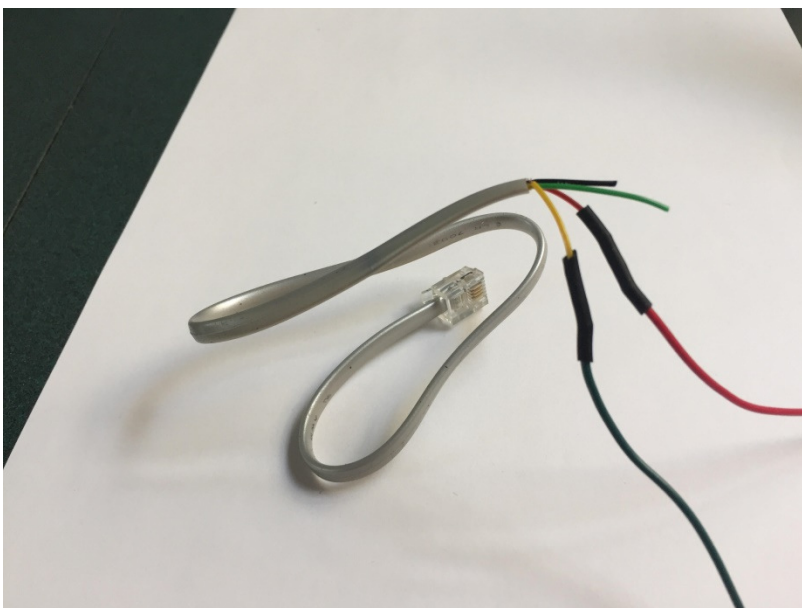


11. Cut about a 10cm length of phone cable with the plug still attached. Strip about 3cm of the insulation off the phone cable. Strip about 1cm of insulation off the red and yellow wires(see picture). You don't need to solder wires onto the red and yellow wires. That's optional.

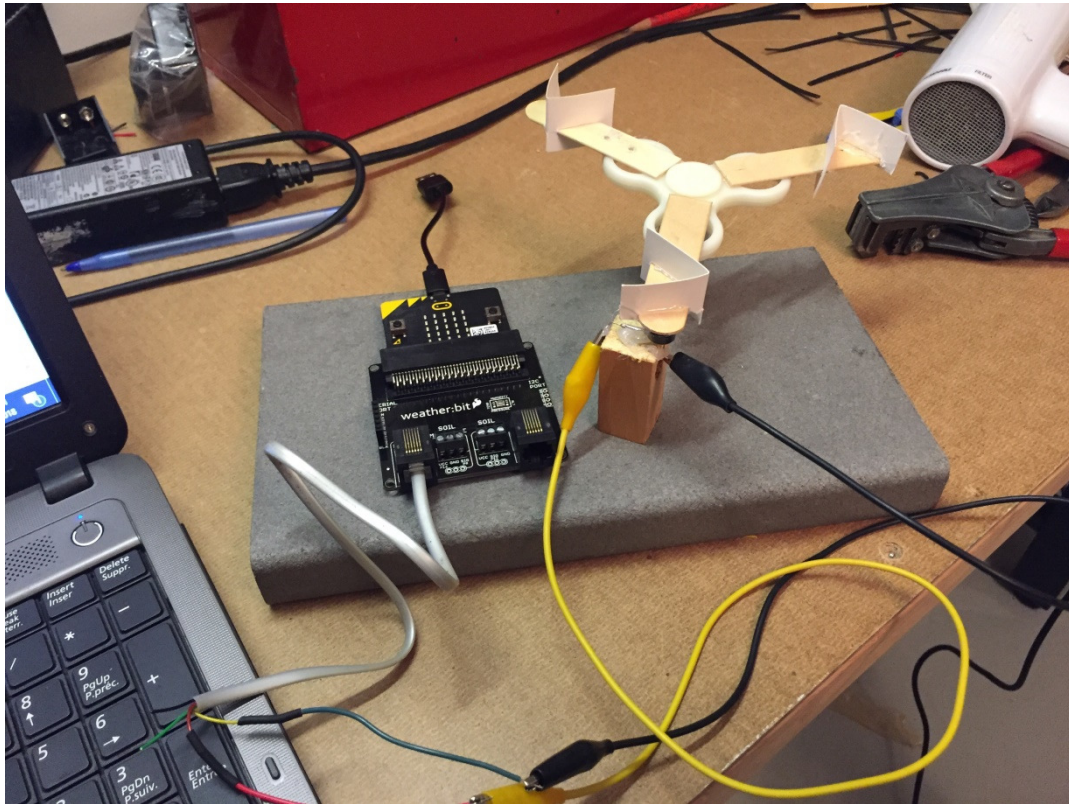
**Looking at the plug from the top (tang side up), you need the left-most (yellow) and third wire from the left(red).**



Your wire colours may differ from above. The 1<sup>st</sup> and 3<sup>rd</sup> wires from the left side of the plug are the ones you need.



12. Connect the alligator clips to the two wires from the phone cable to the two wires on the reed switch. Then plug the modular jack into the weather:bit module left-hand jack (wind speed).





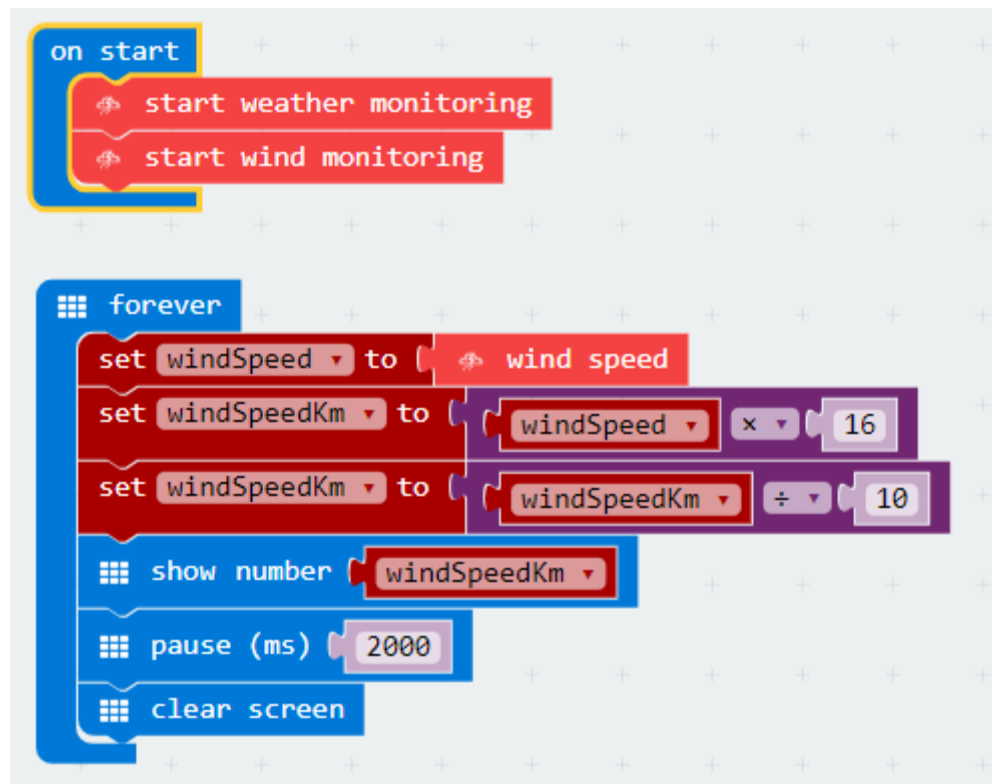
13. Go to <https://makecode.microbit.org/> and enter the following script:

Scroll down through the menu of items and choose 'Add Package'. On the next screen type 'weather:bit' and search for the package. When 'Sparkfun weather:bit' comes up, select it.

You will find the weather:bit specific code blocks under the weather:bit sub-menu.

Enter this script and save it. Upload it to your micro:bit.

Note: the line that multiplies by 16 and then the line that divides by 10 takes care of converting the standard wind speed from miles-per-hour to kilometres per hour.



If possible, get an actual anemometer and use it to calibrate your wind-speed indicator. If necessary, add a couple of lines of code to compensate for the difference between the actual anemometer reading and your indicator's reading for the given speed. A hairdryer is helpful for doing this.

You can see a video of this project at:

<https://www.youtube.com/watch?v=E4UcnOYKTbA>

Have fun!