



MAKE A MICROSCOPE / The Zine

When the Smart Gallery in Aberdeen awarded me a solo exhibition I was finally able to make this project which I'd been thinking about for a few years.

This turned into 'Modern Naturalis' which is an exhibition 29 March - 26 April, 2015. I made a microscope from a USB webcam to gather images which I made into a series of prints and videos.

I was inspired by the Do-It-Yourself attitude that was rampant among early female naturalists.

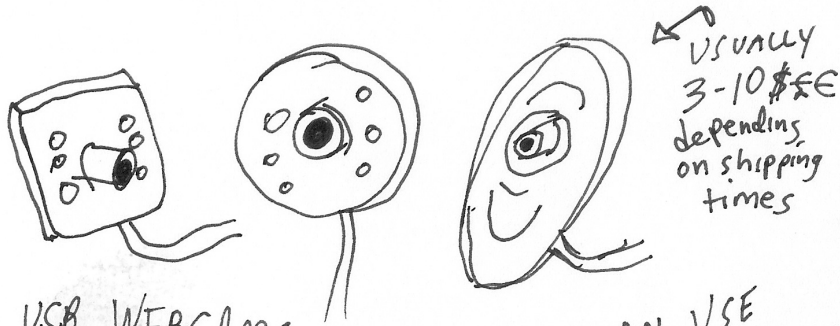
I've been embracing my amateurism, and recommend you do the same. With confidence we can learn and do new things. And much of the new means technology - like computers, webcams, etc.

By exploring, observing, and engaging with the natural world from a different perspective we can consider ecology.

Hopefully this zine will get you well on the way towards your own explorations, if you get stuck I'd say to do an internet search. There are many videos and other helpful links out there.

# Getting started:

The ingredients / parts / stuff you will need:

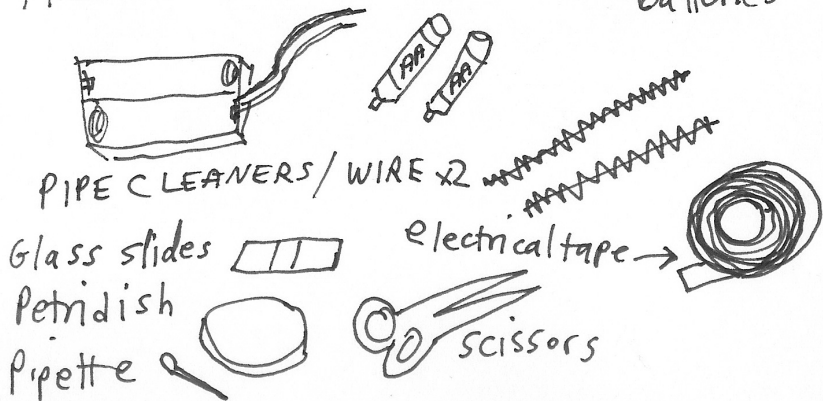


USB WEBCAM:  
WITH LEDS IF POSSIBLE - AS YOU CAN USE THEM AS A LIGHT SOURCE. IF NOT ONES W/ LEDS THAN YOU WILL ALSO NEED TO GET 1 (5mm+white) 3V 20mA

TOOLS: Tiny screwdriver (glasses repair kit) IF LED, Webcam then Needle nose plier

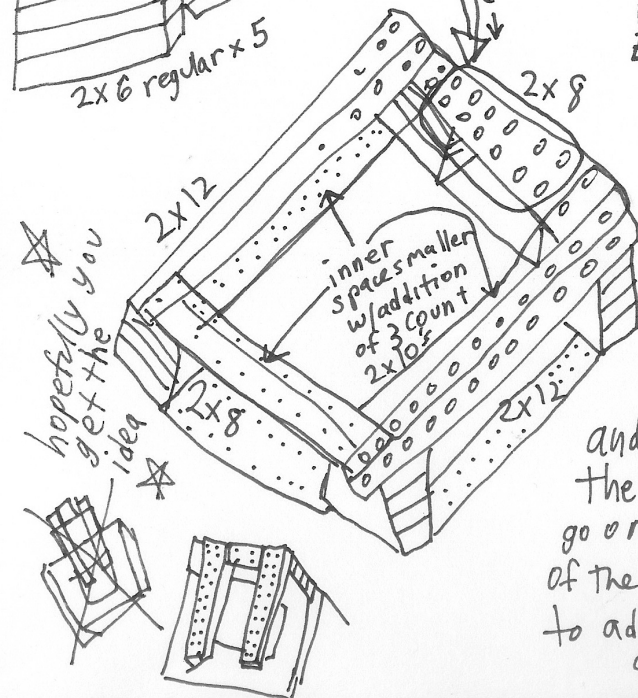
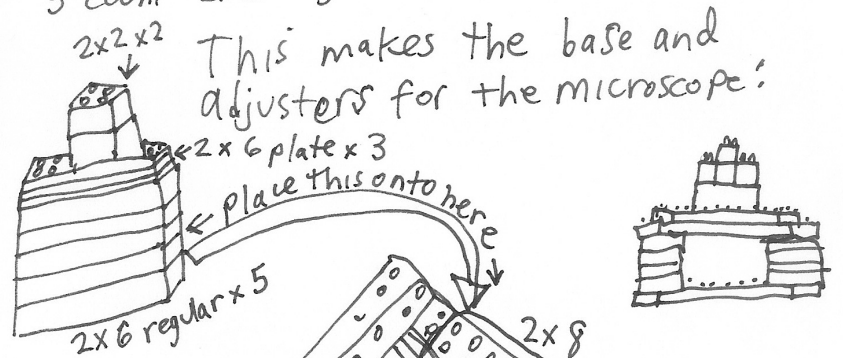
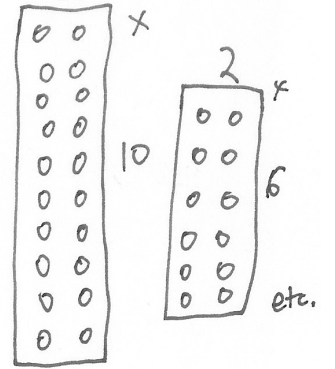
ALSO - A Resistor so the LED doesn't burn out  
1/4 watt (blue looking)

ALSO a 2AA Battery holder/box & 2AA batteries



Also: LEGOS. I've used [bricklink.com](http://bricklink.com) successfully. This will cost about 5-10\$

- 4 count 2x12 plate
- 3 count 2x10 plate
- 2 count 2x10 regular
- 4 count 2x8 plate
- 3 count 2x6 plate
- 5 count 2x6 regular
- 16 count 2x4 regular
- 3 count 2x2 regular



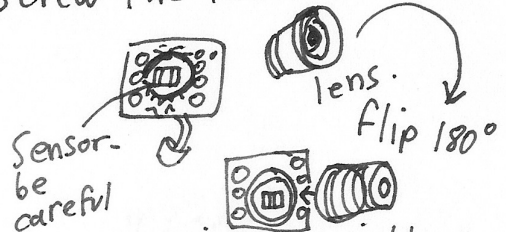
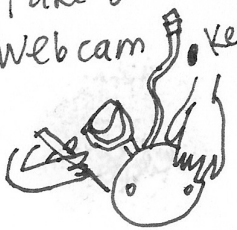
4 pillars of 4 count 2x4 reg

and finally the 2x10 regulars go on either side of the 2x2's to adjust microscope depth.

# THE WEBCAM!

An important thing to consider is that you don't want to get anything onto the sensor of the camera, so be careful.

Take your tiny screwdriver & take apart the webcam. <sup>screws</sup> Unscrew the lens.



IF LEDs are in your webcam remove 2 with needle nosed pliers



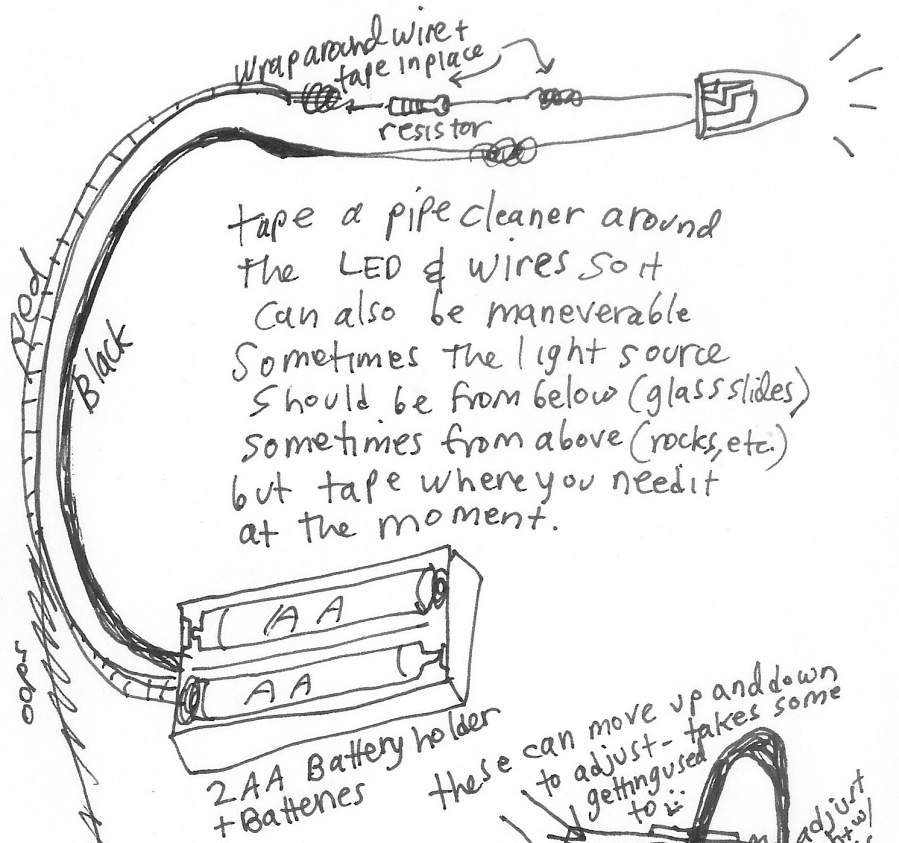
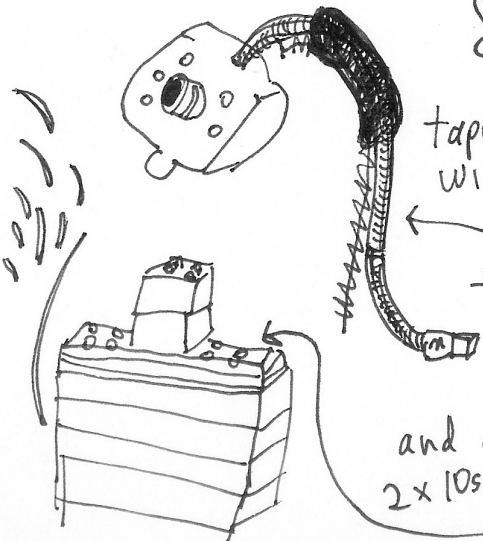
tap with electrical tape together, try to line up and tape well/lightfast re-screw in pieces

then return to the casing, covering any holes (from LEDs) with tape. also disengage from any clips or other plastic pieces.



tape a pipe cleaner to the wire for greater maneuverability

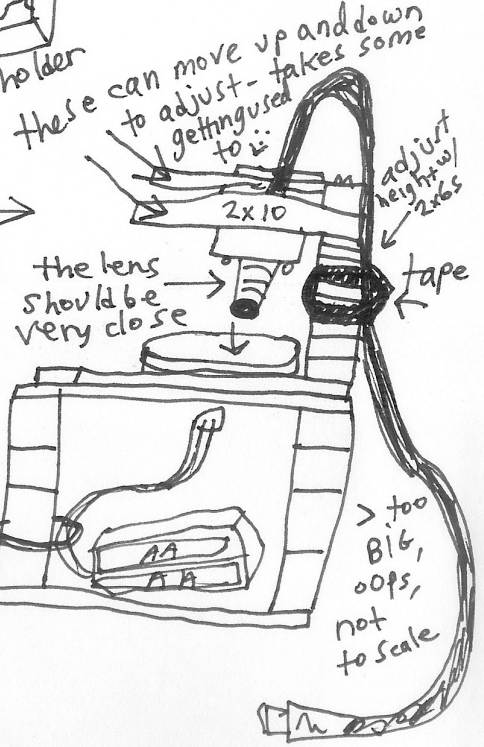
then tape onto the base so it is facing the hole perpendicularly and can be adjusted with the 2x10s as levers. also adjust the height 2x6s



tape a pipe cleaner around the LED & wires so it can also be maneuverable. Sometimes the light source should be from below (glass slides) sometimes from above (rocks, etc.) but tape where you need it at the moment.

place the microscope on a computer screen to see a cool trick: the individual RGB pixels

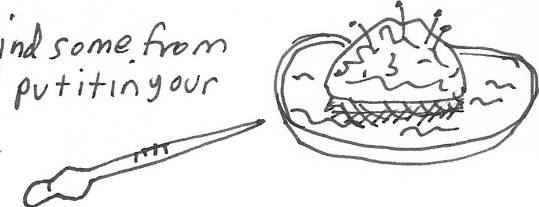
of the if needed.



plug in your USB/microscope & find a program to open it up. it will usually show up as P.C. camera 2.0, I've used Quicktime media player and photobooth, but it should work with most computers. if in doubt do a web search.

# SO, WHAT ARE YOU GONNA LOOK AT?

**MOSS:** Find some from a wall and put in your petri-dish.

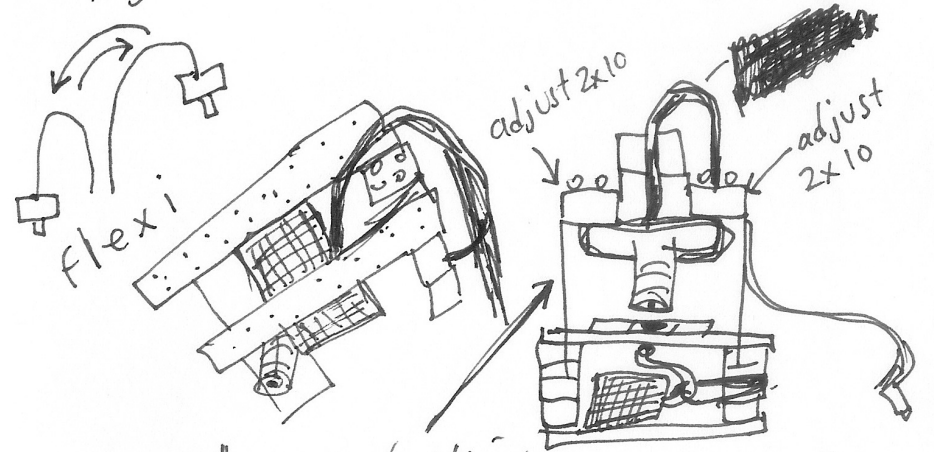


Pipette some of the water and put on a glass slide w/ a cover. This will make it easier to focus.

Below light source  
your coffee look at it wet (on slide)  
look at it once it has dried any changes?

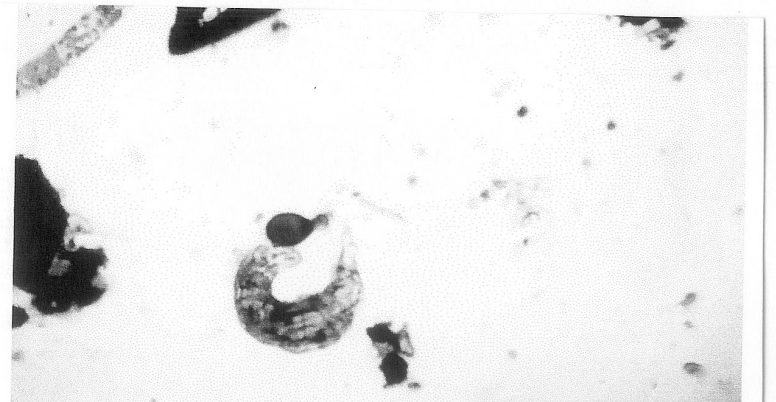
above light source  
some rocks  
a leaf

Getting things in focus: This can be tricky, but once you try it a few times it will become easier.



A picture I took w/ my microscope

I've also drawn from the micro and made movies



"DIY Biology is a rapidly growing global movement whose aim is to democratise, demystify and widen participation in low-cost, hands-on biology - bringing it out of the laboratory and onto the kitchen table."

- Mad Lab



I was inspired to make my own microscope, and with that to develop 'Modern Naturalist' and this zine, by a workshop I attended at The Arts Catalyst in London. They invited the Manchester group, Mad Lab, to host a 'search for the waterbear,'

<http://www.artscatalyst.org/node/709/>

It was part of their exhibition 'Lab Easy!'

My friend Clyde and I arrived, to what we learned was an event for young people.

They let us stay - Adults with a love for learning



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