



MAKE A MICROSCOPE / The Zine



Morgan Cahn

modernnaturalis.tumblr.com

"DIY Biology is a rapidly growing global movement whose aims 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 water bear,'

<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

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 Naturalist' 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.

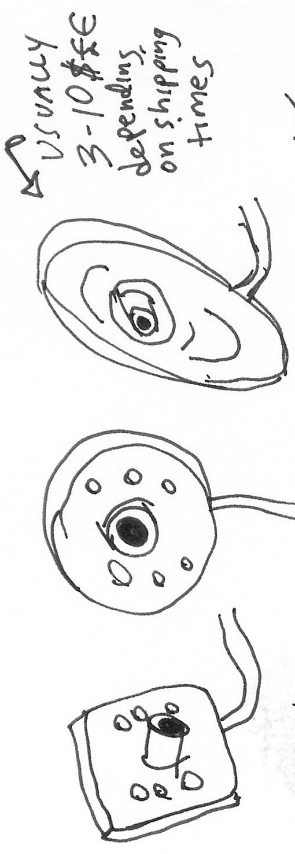
I've been embracing my amateurism, and recommend you do the same. With confidence we can learn and do new things. And much of the new means technology - like computers, webcams, etc..

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:



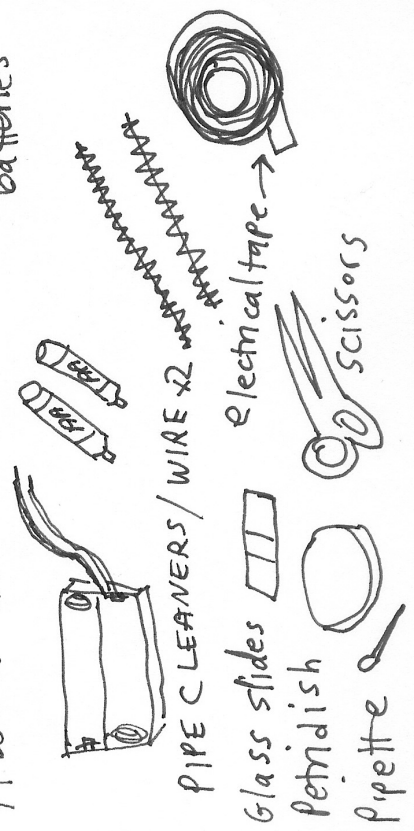
usually 3-10\$ depending on shipping times

USB WEBCAM: WITH LEDS IF POSSIBLE - AS YOU CAN USE THEM AS A LIGHT SOURCE. IF NOT GET 1 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

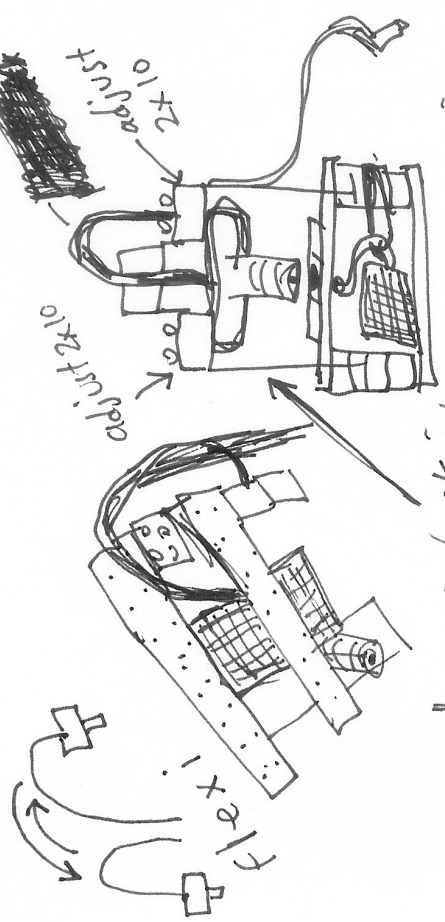
ALSO - A Resistor so the LED doesn't burn out 1/4 watt (blue looking)

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



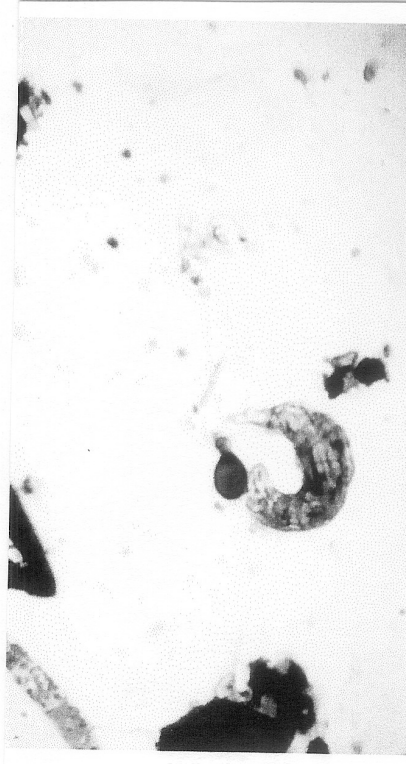
Getting things in focus:

This can be tricky, but once you try it a few times it will become easier.



tape on back with enough height that there is tension between the camera and the legos - the pipe cleaner helps.

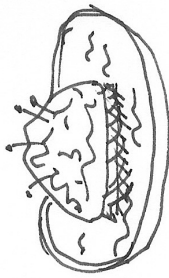
I've also drawn from the micro and made movies



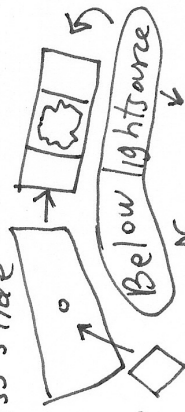
plug in your USB/microscope & find a program to open it up. it will usually show up as P.C. camera 2.0, I've used Quicktime media player and photo booth, but it should work with most computers. if in doubt do a web search.

SO WHAT ARE YOU GONNA LOOK AT?

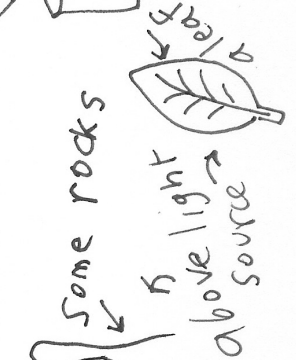
Moss: Find some from a wall and put it in your petri-dish.



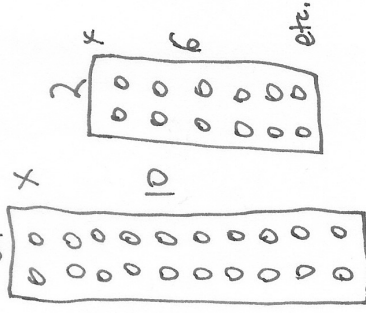
Pipette some of the water and put on a glass slide w/ a cover. This will make it easier to focus.



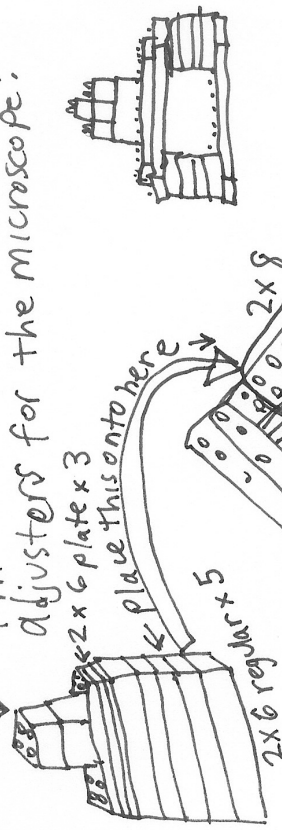
Some rocks. Look at it once it has dried any changes?



- Also: LEGOS. I've used 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

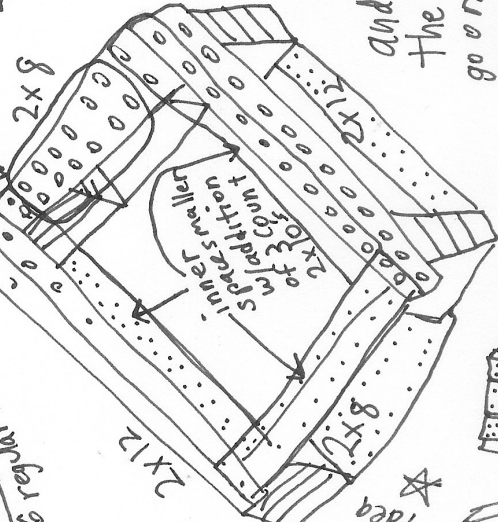


This makes the base and adjusters for the microscope.

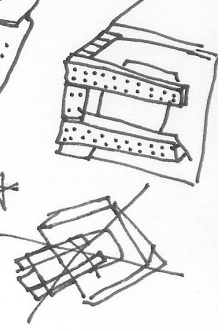


- 4 pillars of
- 4 count
- 2x4 reg

and finally the 2x10 regulars go on either side of the 2x25 to adjust microscope depth.



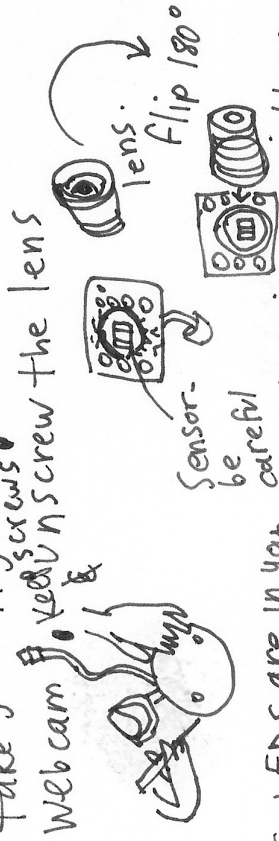
hopefully you get the idea



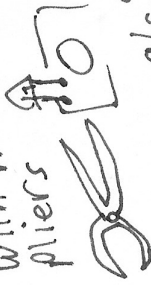
THE WEBCAM:

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.



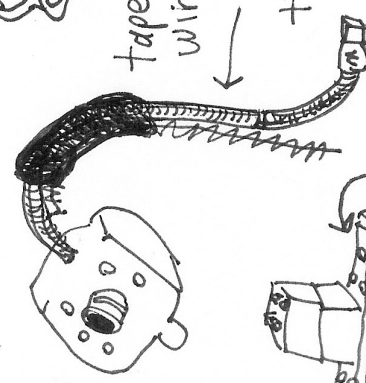
If LEDs are in your webcam remove 2 with needle nosed pliers



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

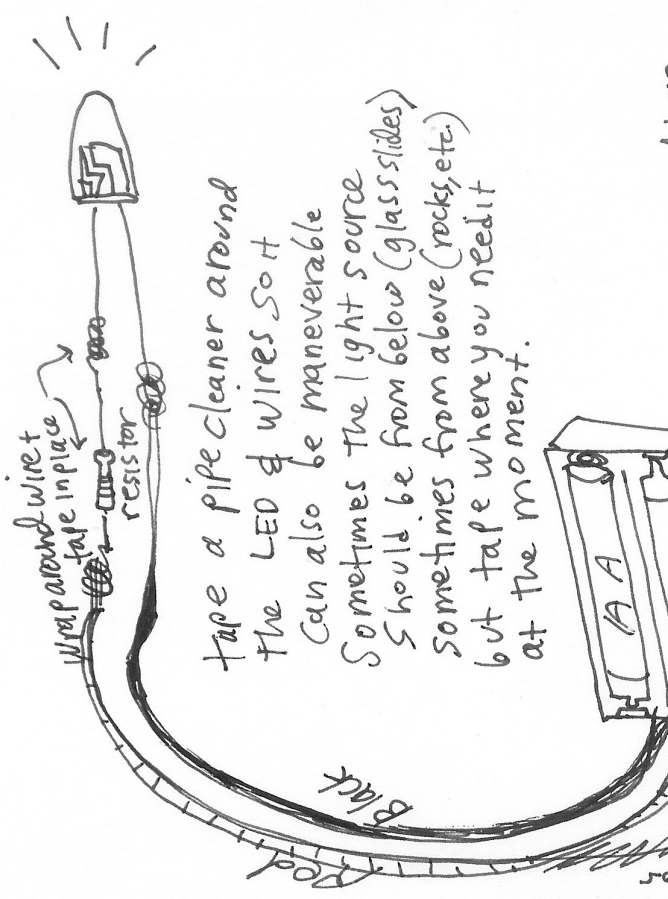


tape a pipe cleaner to the wire for greater maneuverability



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 2+6s



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.

