Updated Project Proposal

Title : Insecticide effects on plants growth
Aim : Determining the impact of caffeine on the growth of buckwheat seeds

Materials :

- caffeine
- buckwheat seeds
- 25 petri dishes
- 2 humidity & temperature sensors
- cotton
- water

Protocol :

- Prepare 5 solutions
  *A= 500mL of water + 0mg of caffeine (0mg/mL)
  → negative control
  *B= 500mL of water + 100mg of caffeine (0,2mg/mL)
  *C= 500mL of water + 300mg of caffeine (0,6mg/mL)
  *D= 500mL of water + 500mg of caffeine (1mg/mL)
  *E= 500mL of water + 2500mg of caffeine (5mg/mL)
  → positive control
- Put 20 buckwheat seeds in each of the 5 solutions and let them in it during half an hour
- Label 5 petri dishes : 0mg/mL , 0,2mg/mL , 0,6mg/mL , 1mg/mL and 5mg/mL
- Spread 15mL of solution A on the "0mg/mL" petri dish
- Spread 15mL of solution B on the "0,2mg/mL" petri dish
- Spread 15mL of solution C on the "0,6mg/mL" petri dish
- Spread 15mL of solution D on the "1mg/mL" petri dish
- Spread 15mL of solution E on the "5mg/mL" petri dish
- Put cotton in the 5 petri dishes and soak it

- Put the 20 buckwheat seeds of the solution A on the cotton of the "0mg/mL" petri dish
- Put the 20 buckwheat seeds of the solution B on the cotton of the "0,2mg/mL" petri dish
- Put the 20 buckwheat seeds of the solution C on the cotton of the "0,6mg/mL" petri dish
- Put the 20 buckwheat seeds of the solution D on the cotton of the "1mg/mL" petri dish
- Put the 20 buckwheat seeds of the solution E on the cotton of the "5mg/mL" petri dish
- Repeat the experiment 5 times (= 5 replicates)
- Place randomly 20 petri dishes without their lids, in a transparent greenhouse previously constructed with the cutter laser (The greenhouse was too small so put the other 5 petri dishes outside of the greenhouse)
- Place the first humidity & tempearature sensor on a extremity of the green house , and the other one on the other extremity → it will allows us to control the temperature and humidity of the environment

After 1 day

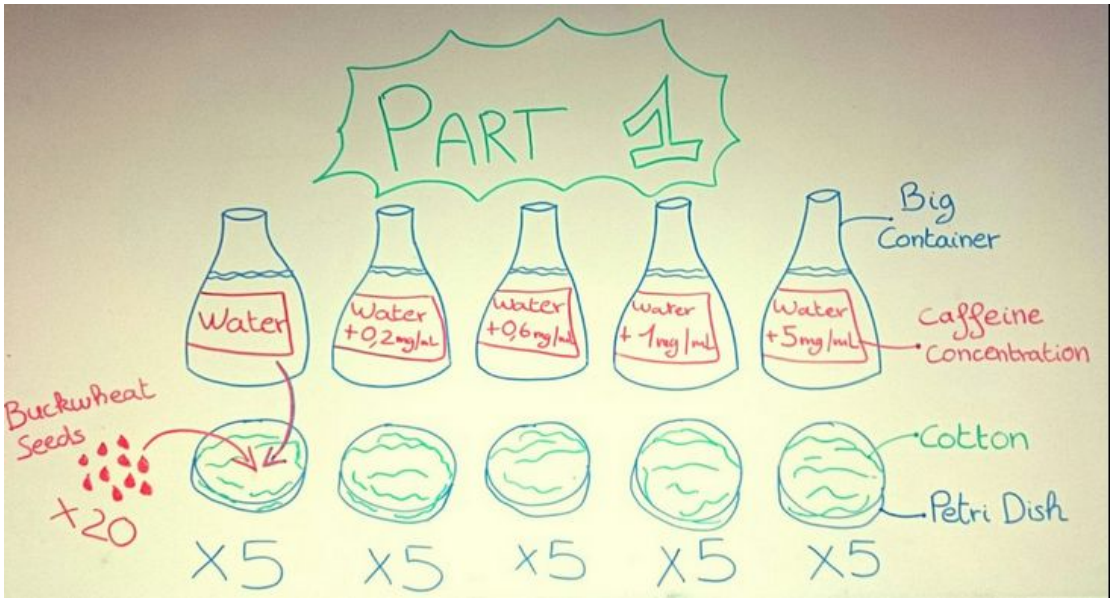
- Re soak the cottons
- To do so, re prepare 5 solutions as following :
  *A= 200mL of water + 0mg of caffeine (0mg/mL)
  *B= 200mL of water + 40mg of caffeine (0,2mg/mL)
  *C= 200mL of water + 120mg of caffeine (0,6mg/mL)
  *D= 200mL of water + 200mg of caffeine (1mg/mL)
  *E= 200mL of water + 1000mg of caffeine (5mg/mL)
- Spread 15mL of solution A on the cotton + seeds of the "0mg/mL" petri dish
- Spread 15mL of solution B on the cotton + seeds of the "0,2mg/mL" petri dish
- Spread 15mL of solution C on the cotton + seeds of the "0,6mg/mL" petri dish

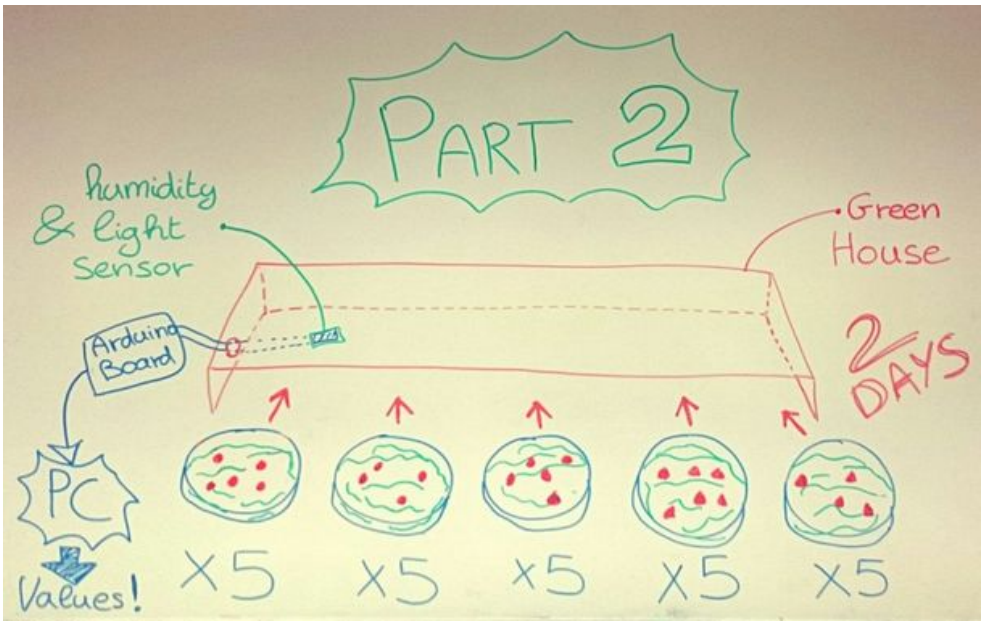
- Spread 15mL of solution D on the cotton + seeds of the "1mg/mL" petri dish
- Spread 15mL of solution E on the cotton + seeds of the "5mg/mL" petri dish
- Weigh each seeds (one by one) with a precise scale
- Collect all the data on a google sheet
- Plot the data on ipython

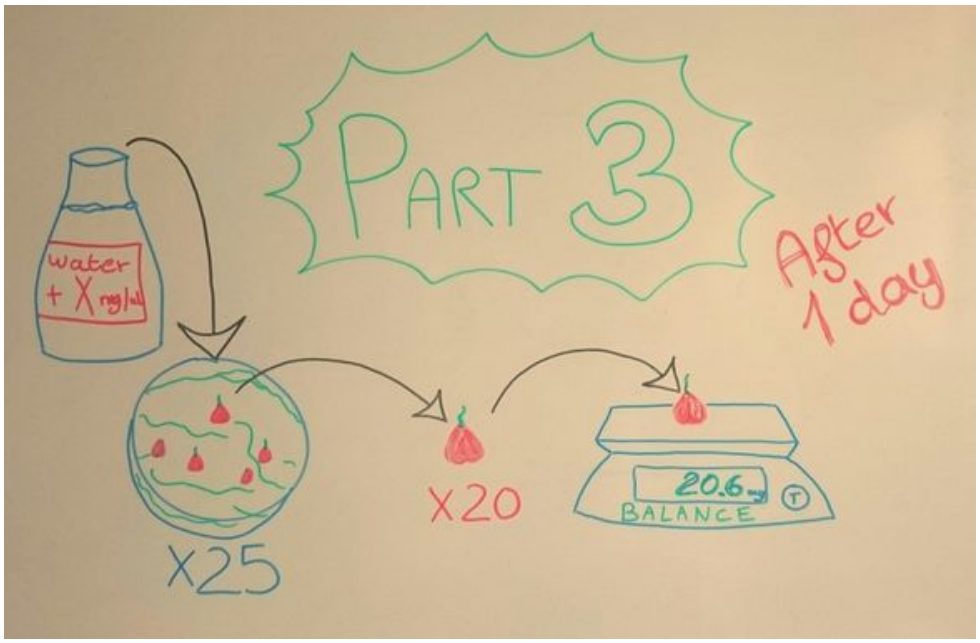
After 2 days, the seeds opened and the germs grew

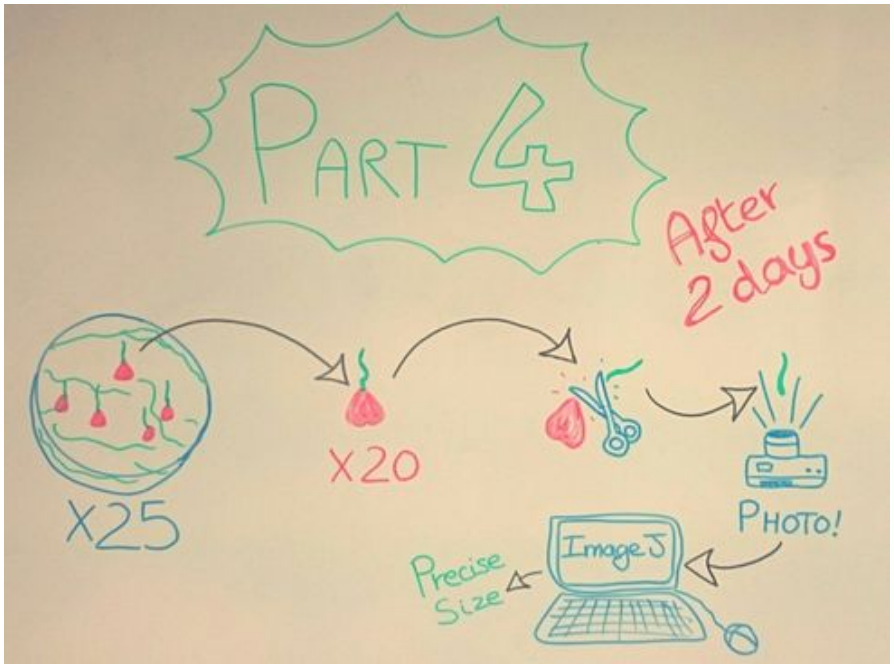
- Measure the height of all the germs with ImageJ software
- Collect all the data on a google sheet
- Plot the data on ipython

Visual Protocol :




PART 2
Humidity & Light Sensor
Green House
Arduino Board
2 DAYS
PC
Values!
X5
X5
X5
X5
X5


PART 3
After 1 day
water + X ng/µl
X25
X20
20.6 mg
BALANCE



Note: *Measurements of the pH of our 5 solutions*

A= 7,64

B= 7,75

C= 7,83

D= 8,04

E= 8,70