Do lentils sense a wider light-wavelength spectrum than an electronic sensor?

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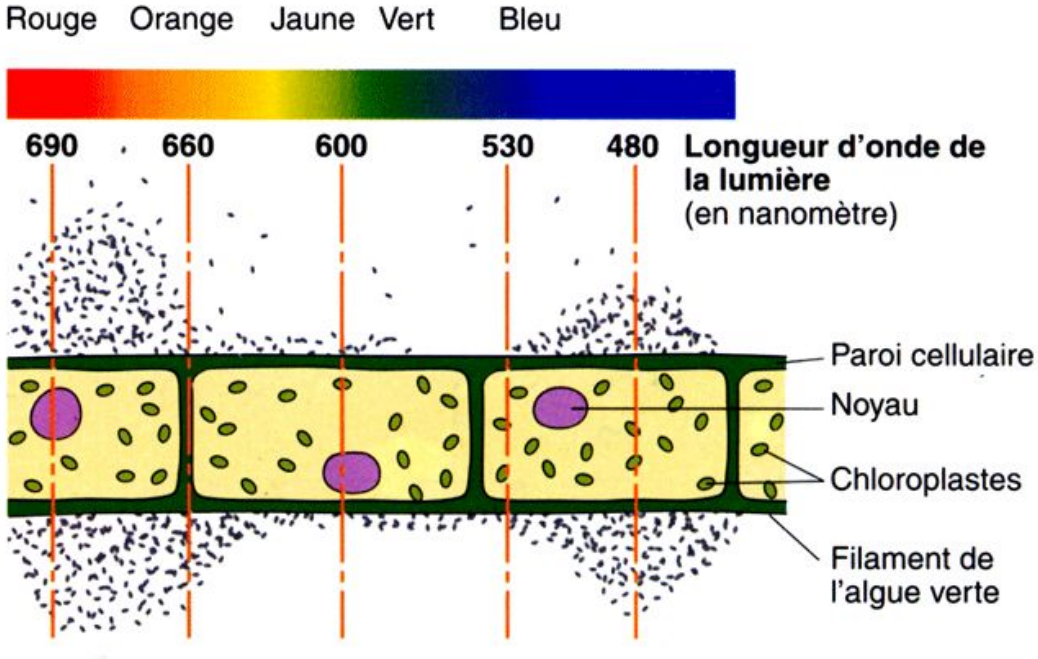
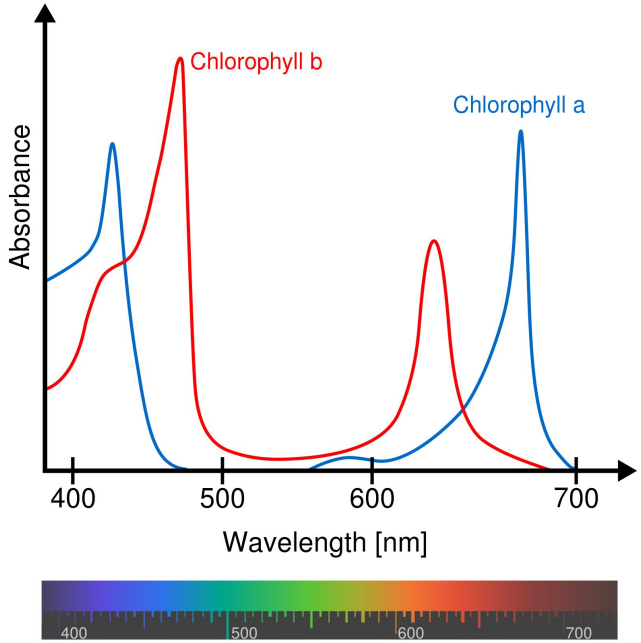
Our Inspiration: the Experiment of *Engelmann*

Wavelength influences the quantity of O_2 produced :
the algae sensor detects the wavelength and reacts differently.



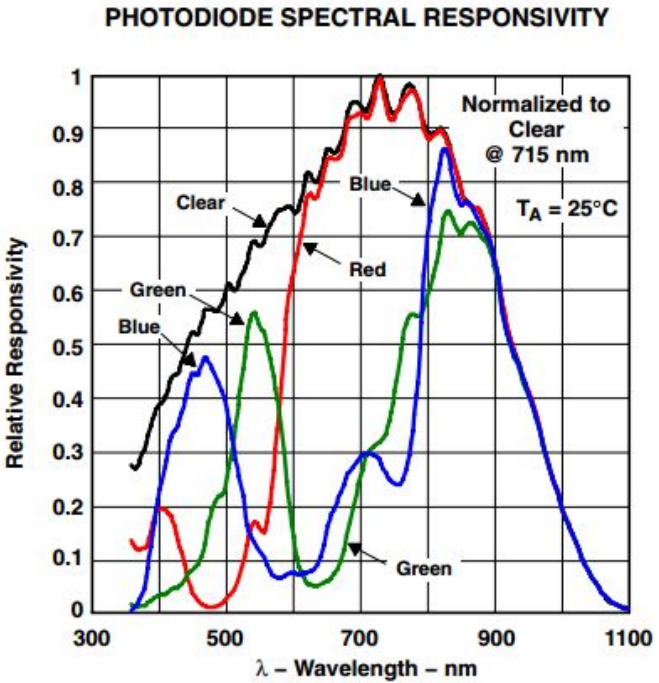


***Left** : From 2003. Sciences de la vie et de la Terre, Terminale S spécialité. Nathan : 29.*
***Right :** From common Wikipedia*

Who has the larger spectrum ?

Lentils VS TCS3200

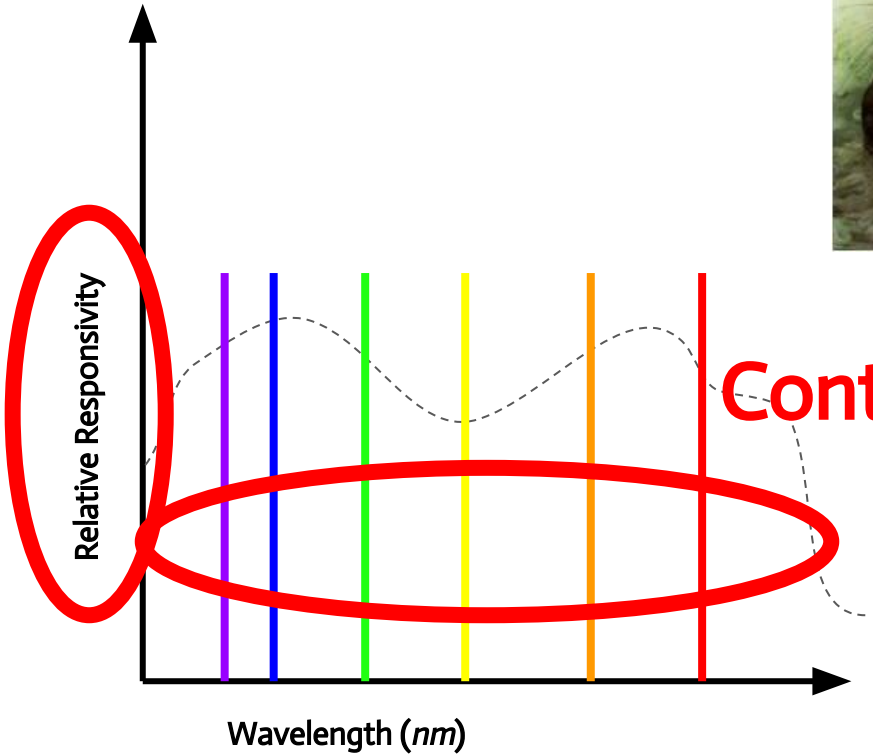
flickr.com



Problems encountered ?

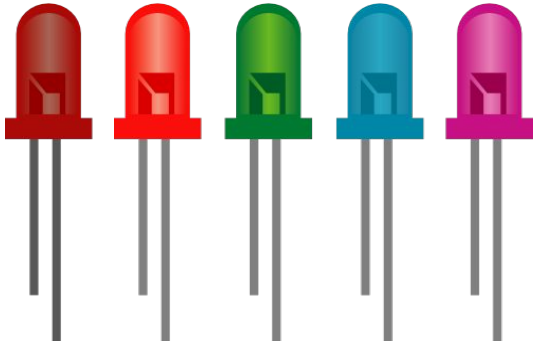
followatch.fr

HOW ?

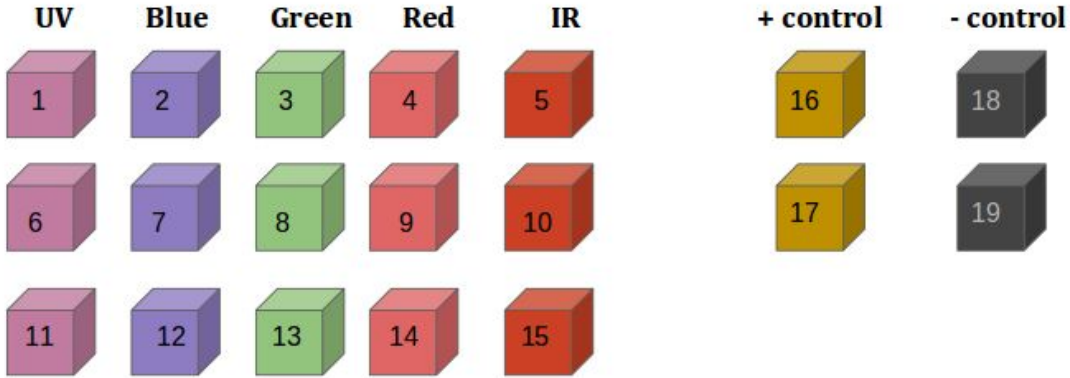


Continuous/Discrete ?

Choices and Set-up



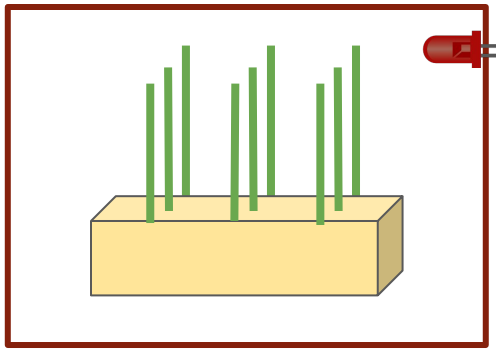
Extracted from http://www.novarun.fr/

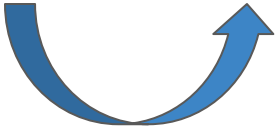


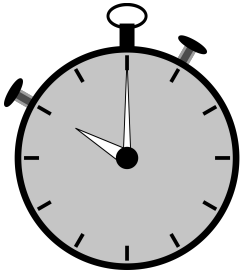
5
wavelength

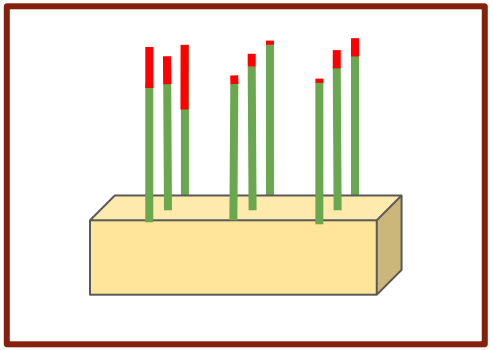
19
Boxes

Measurements and data analysis - Biological sensor







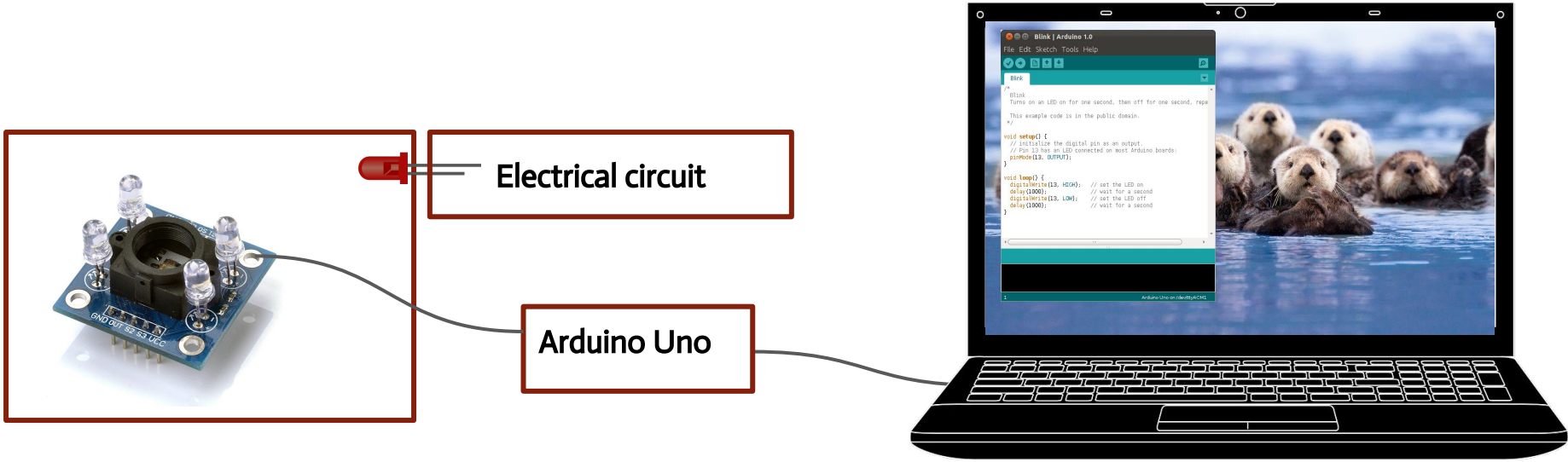


9 lentils per box

Does the wavelength change the size ?

Growth ⟺ Relative Responsivity

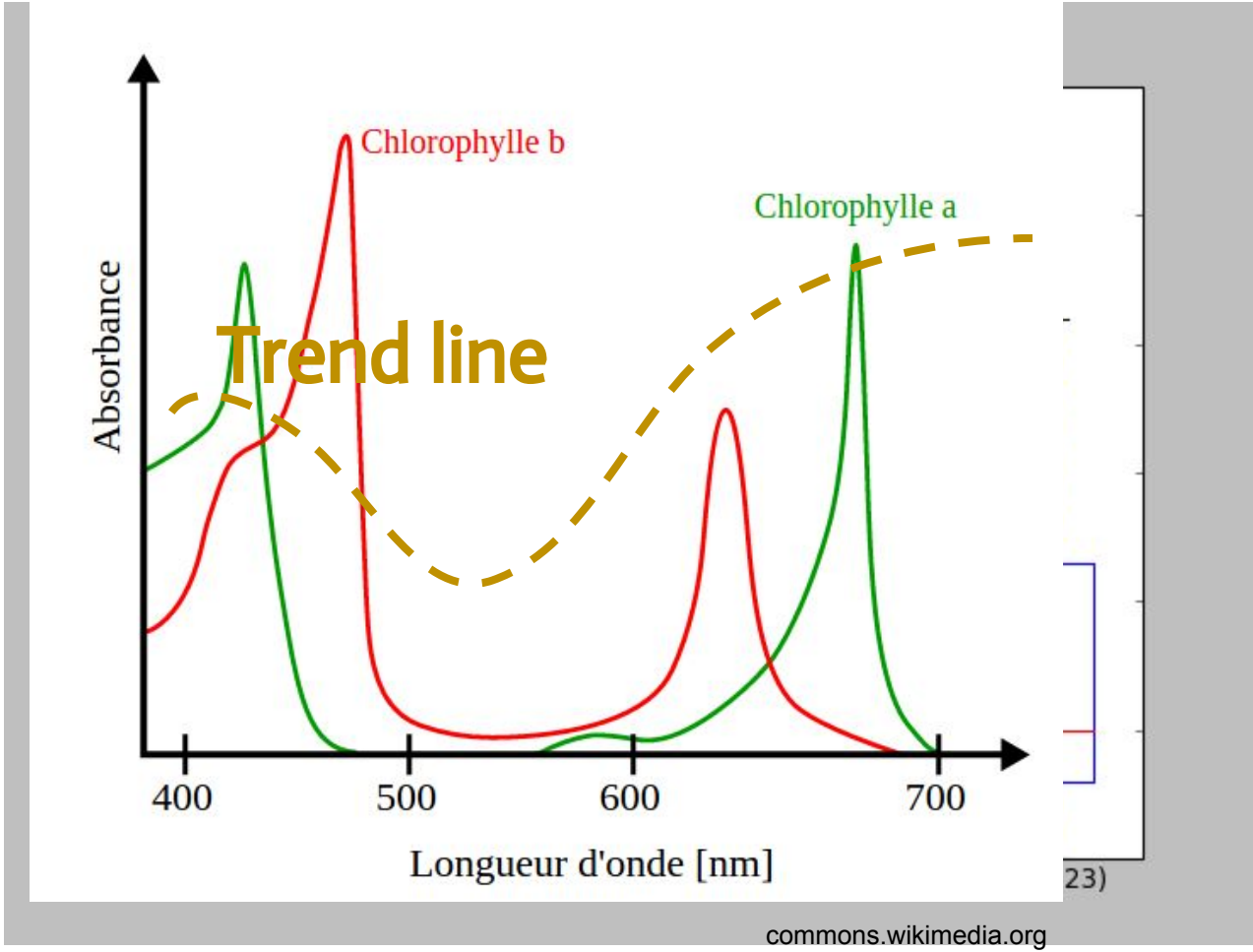
Measurements and data analysis - Electronical sensor



TCS3200 Color Sensor

Data : Lentils growth

n(total) = 94 lentils



Data : electronical sensor

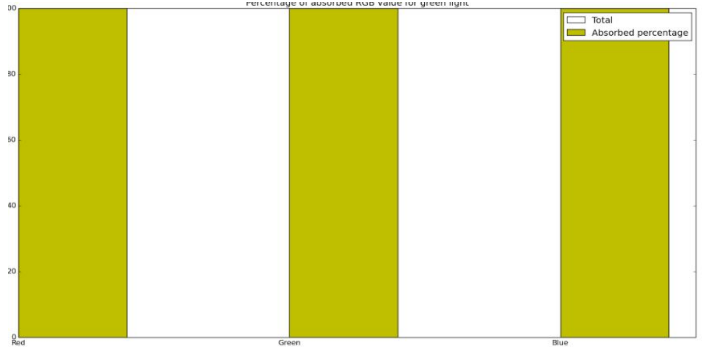
PERCENTAGE OF R,G,B LIGHT NOT ABSORBED

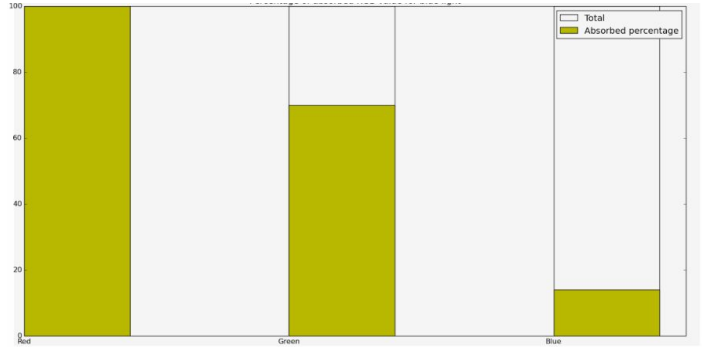
FROM 0% to 100 %

50 %

RED GREEN BLUE

Data : electronical sensor





RED **GREEN** **BLUE**

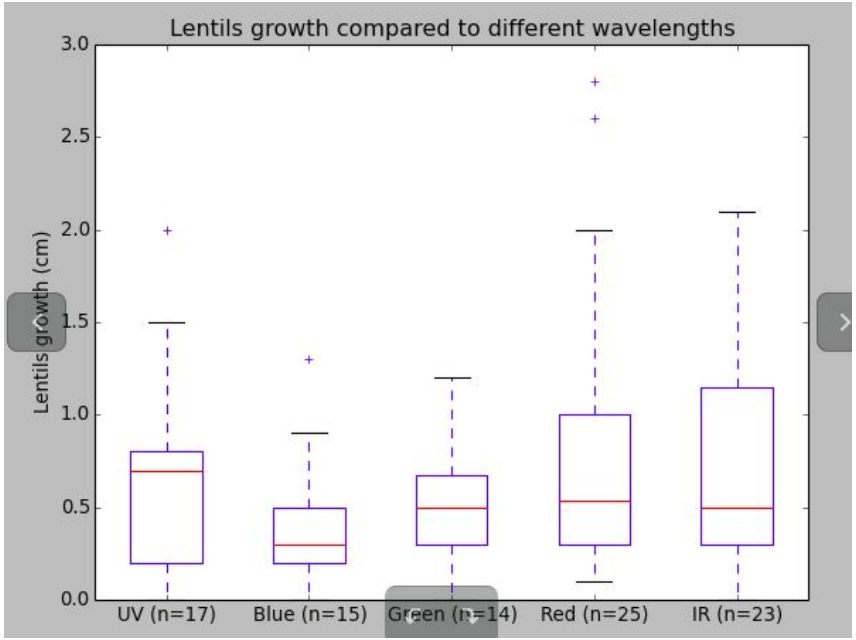
GREEN IS NOT RECOGNISED

BLUE IS RECOGNISED

Analysing Data

How to compare ?

www.jujube-en-cuisine.fr



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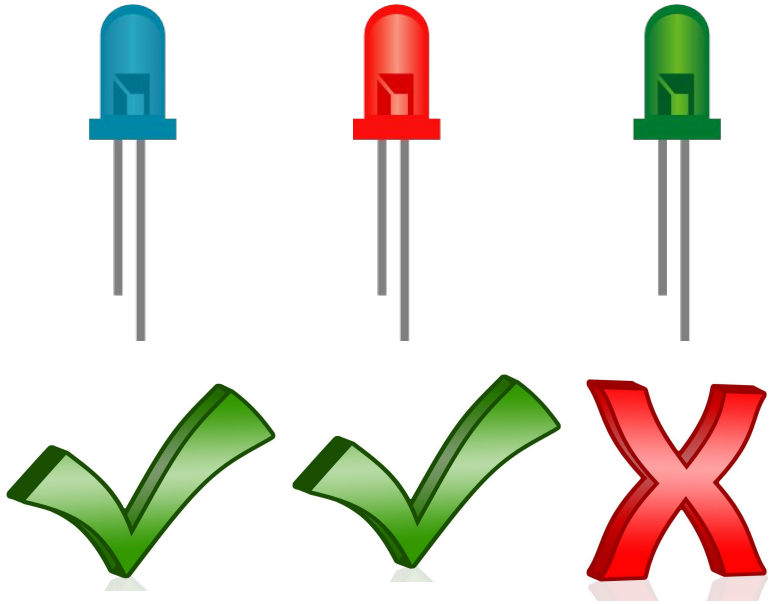

Bias in our experiment

- Boxes were not perfectly hermetic
- Difference of LED intensity
- External factors that can influence growth of lentils
  - Temperature
  - Humidity
  - Stages of lentils development at the beginning of the experiment

Thanks for your attention!

Acknowledgments:

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Others Biosensors teams for their help and support

giphy.com

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