N°3 - June 2019

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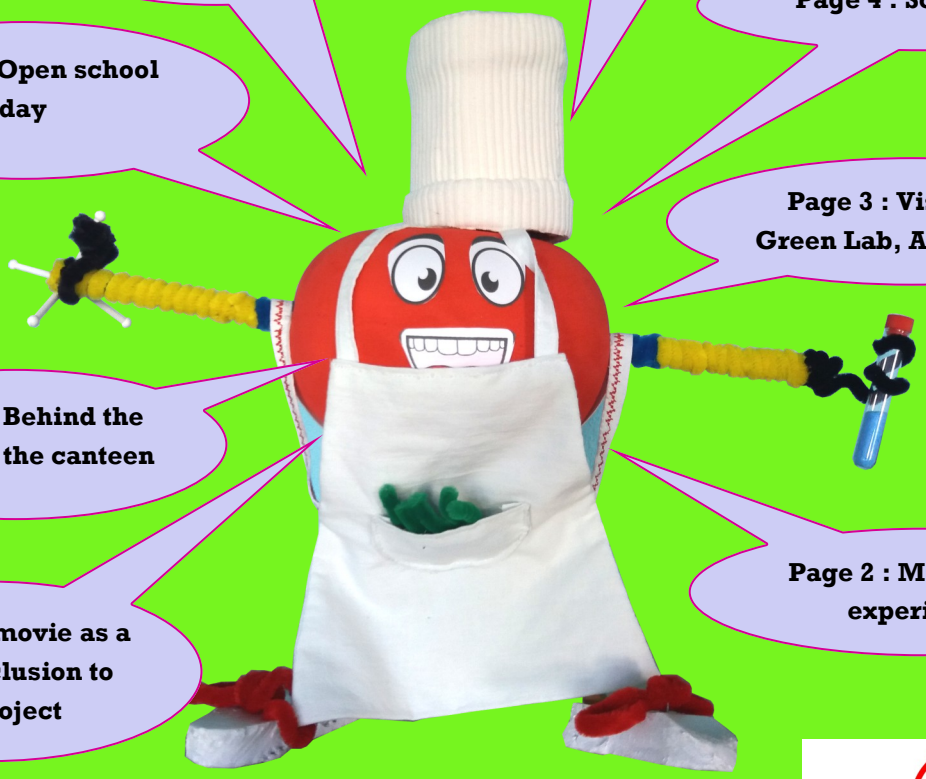
Science and Cooking n°3

Dr Atomato's third recipe: when cooking makes us *addicted* to science!

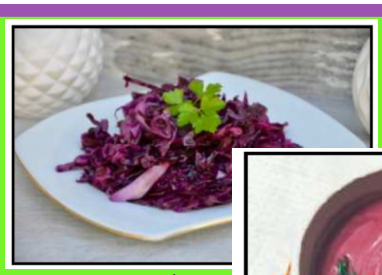


Cooked by Aya, Baptiste, Célestin, Eloïse, Emilien, Ferdinand, Inès, Jordane, Joseph, Laura, Lou, Marwa, Morgane, Pierre, Robin, Soline, Soraya, Telio.

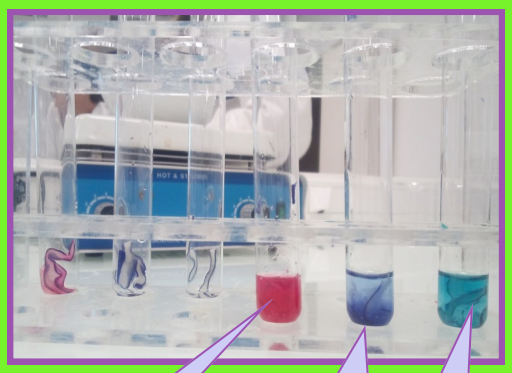
Food at school : colors and preparation

Red cabbage to compose a color symphony

First we looked at red cabbage soup, red cabbage mash and red cabbage salad which have a totally different color although their ingredients are almost the same!! So we asked ourselves "What on Earth is going on ?" and we searched for answers (otherwise we wouldn't be writing;).



Amazing Chemistry !



We did some experiments and we found out that red cabbage changes its color based on acidity. In the soup, there was some lemon juice which is acid; in the mash, there was sodium bicarbonate which is basic; and in the salad, there was nothing (neither basic nor acid).

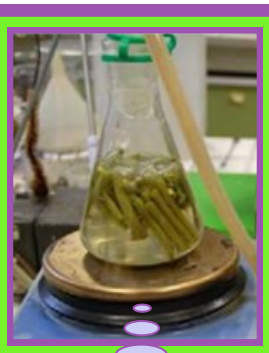
Ferdinand-2°1 & Roméo-2°6

Mister Bean experiment

We made an experiment with green beans. First we cut up the beans into small pieces, then we put them in an Erlenmeyer flask and added mineral water. One group added bicarbonate while the other didn't. We heated the flasks and waited until the water boiled.

After this experiment, we determined the pH of the water used for beans with pH paper. The results were different. First, with bicarbonate, the beans kept their color and the water turned brown. In the other group, the water color didn't change but the color of the beans was darker.

Thus, Magnesium ions were released in both juices but in a higher quantity when beans are cooked without baking soda (bicarbonate).



Without baking soda

With baking soda

Emilien, 2°1 & Jordane , 2°4

Behind the scenes of the school canteen

On the 1st of April , we visited Montmajour's kitchen with the lovely chef Florence Lagache. This is a super geared kitchen, with a lot of equipment, like a waterless dish washing machine, a UV sterilising knife machine, an automatic potato peeling machine and even a unique thing in our region, a deep-freezer. The latter is very useful when some students are missing at the canteen, so the food isn't wasted.

All the meals are planned by the chef, one week beforehand. They have more than 200 different recipes. All the meals are prepared by the canteen staff and made from scratch. Moreover they use high quality and often organic ingredients. They butcher carcasses themselves, instead of buying meat already cut up; so the meat is cheaper and she can offer extra-food for Christams such as home-smoked salmon or homemade foie gras.

The staff begin their work at 6 a.m. and finish at 2 p.m. but they come back to cook for the boarding studentsat 5:30 pm.

The food safety needs to be controlled, so the canteen must-keep a sample of every dish they prepare for two weeks.

Célestin, 2e5

Our chef Florence

Extraction and recycling of plant material

LUMA site and Atelier LUMA

The Luma site is located on the former site of the SNCF workshops and the vocation of this huge architectural complex is to develop a cultural platform for research and artistic production.

The Atelier Luma is housed in the back of the general mechanics building. It consists of a think-tank gathering artists and scientists to create and design new materials from organic waste such as sunflowers stems, invasive plants and algae. The main goal of this department is to sensitize people about waste matters.

We visited the Atelier LUMA in April. During this visit, we could see the model of the finished tower and get access to the laboratory where we saw artists and scientists working on their different projects

Eloise & Laura - 2e1

Visit of the GREEN lab University of Avignon

On the 27th of May, we came to the University of Avignon to meet the GREEN Lab's team who is working on different eco-friendly energy-saving and solvent-free processes to extract natural substances from plant material.

To harvest essential oil from lavender or citrus peels, apart the classic steam drive or the Soxhlet techniques, they usually use micro-waves or ultrasounds.

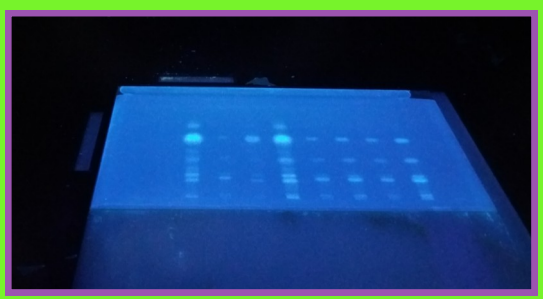
Microwaves speed up usual extraction processes thanks to rapid heating of the plant matrix. Microwaves cause vibrations within the polar targetted molecules which increase the temperature in the whole plant material volume. They patended a 150 pound microwave oven which costs around 150,000 euros.

Ultrasounds act in a different way : they induce the cavitation phenomenon which shreds the plant cells, freeing all the natural substances they contain without any distinction.

Some of their PhD students are also working in partnership with industry on protein extraction from insects.

We also discovered the wide range of analytical instruments they own, from chromatography to titration to check the quality of their extracts.

Karine & Karin – teachers



And to involve surrounding people, a lot of dissemination to make!

Open school Day

We will talk about Montmajour High School's open day which happened on the morning of Saturday, February 2nd. There were parents and their children of the middle school who came to discover the establishment with the options and projects we do here. Some of the students of Science & Cooking were there to show them science and cooking's activities and try to encourage student to come join us next year..

Children can see different experiences and they made their opinions on what we were doing.

We show them two experiments:

- a sphere of coke with liquid coke in it made with calcium alginate
- a lecithin orange foam

Aya - 2e3, Marwa - 2e4

when students take action...

School Day

At the school day we held a stand with the flags of the European countries. There were leaflets and kitchen tools on the tables. We did some food experiments like chocolate spaghetti or coke jelly which we proposed to people who passed by the stand. All the students wore an Erasmus t-shirt and distributed Erasmus leaflets. We explained to people what an Erasmus project is and we tried to convince them to join us.

Joseph, 2e3

yummy!

A movie as a vivid conclusion to our Project!

We made a movie to present our high school, and our project: Science and Cooking. We shot it in different locations in the school, like the kitchen, the library, the gym, the corridor and outside. We danced on a song by BTS, a K-pop band. Everybody participated except for a few students. It was complicated to dance in the gym because sometimes there were other students there. It was hard to film outside because of the wind and the rain!

The goal of this work was to discover the chemical part of cooking in the language of Shakespeare. Working on this Pass project was very interesting because we learnt a lot of things in a great atmosphere. Moreover we made such awesome school trips, to a starred restaurant, to the Luma oundation site… We made chocolate spaghetti, soja lecithin foam, red cabbage pH test and even solid droplets of raspberry syrup. We worked with awesome teachers and people. This movie is the result of several months of hard work, and we're very proud to showcase this product.

Ferdinand & Telio, 2e1 - Célestin R. & Roméo, 2e6