

Aprendizaje basado en proyectos STEAM con formato KIKS

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Santander



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OPEN STEAM GROUP



EAMARE-STEAM

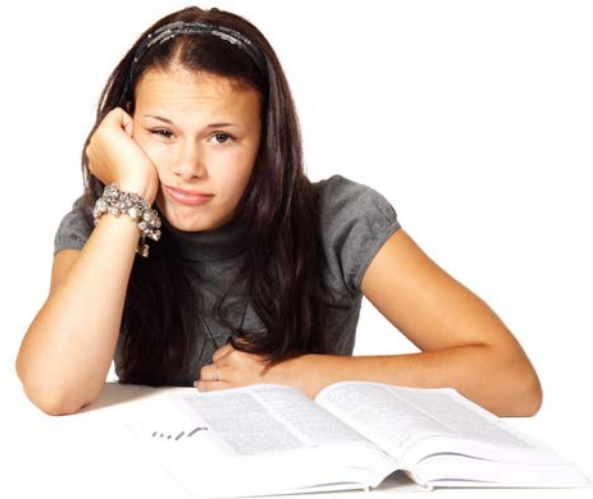


<http://www.opensteamgroup.unican.es/>

Objetivo

El **formato KIKS** busca promover el interés del alumnado por el aprendizaje, mediante el desarrollo de actividades STEAM, participando en una comunidad educativa a nivel local e internacional. En particular, los alumnos han de desarrollar actividades STEAM para motivar a sus homólogos:

- Trabajando de forma interdisciplinar
- Trabajando en equipo
- Haciendo uso de la tecnología
- Trabajando en lengua inglesa
- Fomentando la creatividad, la comunicación y la transferencia de conocimiento



Intervención de alumnos

- Colegio San José Niño-Jesús: Aitana Matos Puente y Alberto Bascones de la Arena
 - Diseño y Construcción de una plataforma flotante

FLOATING NEST

1º ESO

BIOLOGY
PROJECT



Aitana Matos.

Víctor Calles.

Saúl Martínez.

Alberto Báscones.



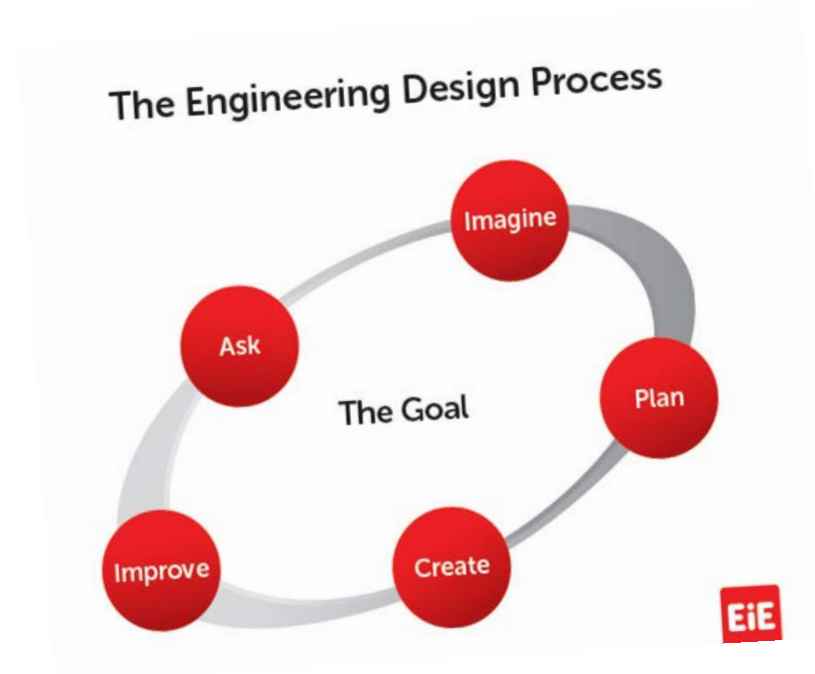
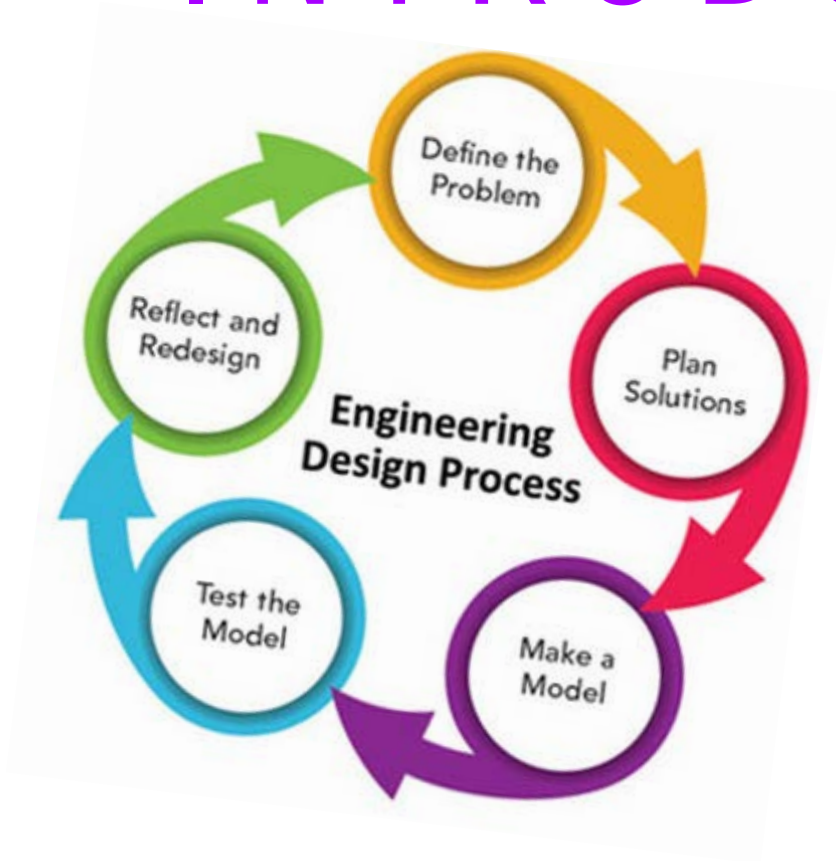
IN COLLABORATION WITH...



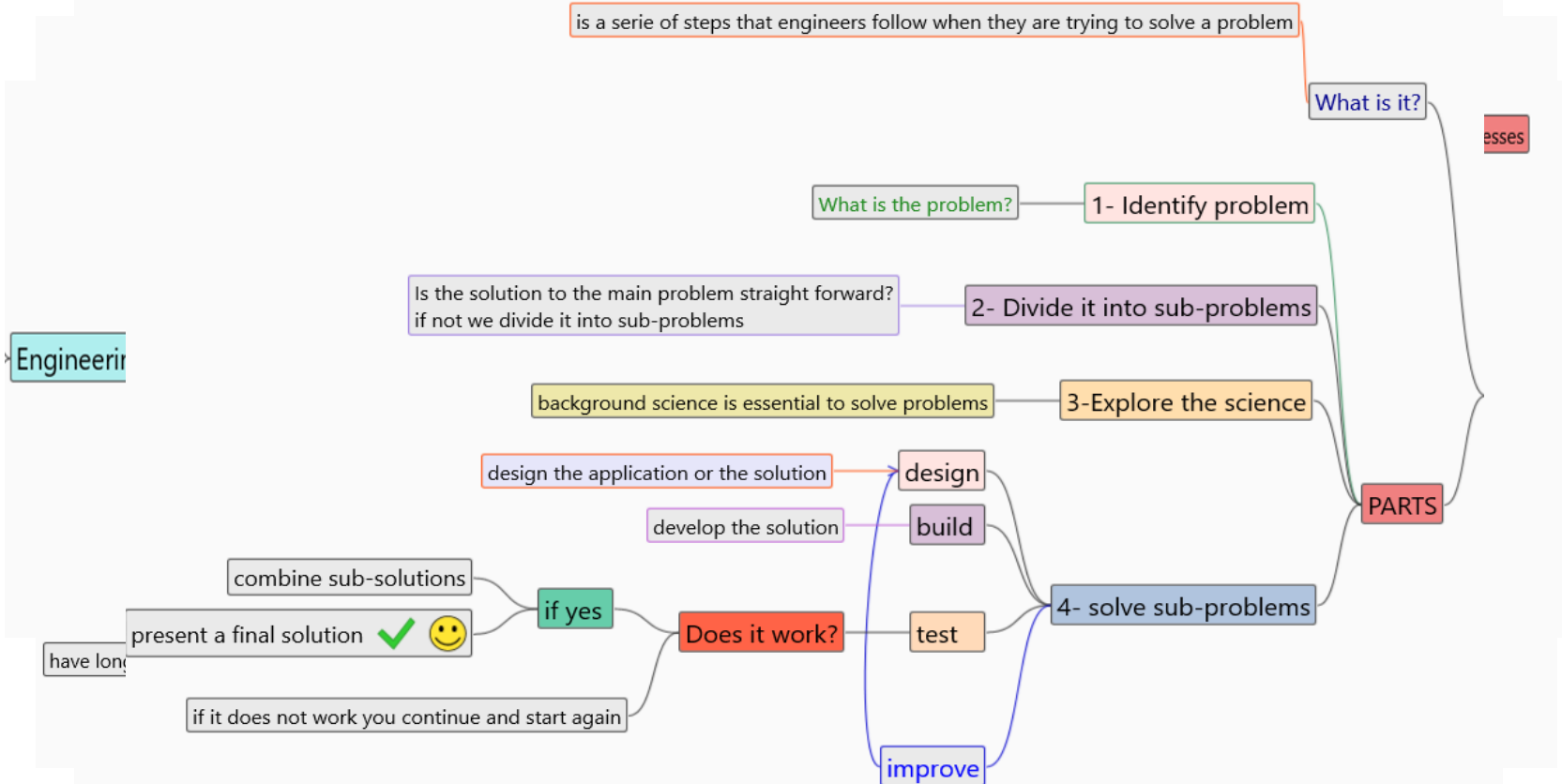
AYUNTAMIENTO DE CAMPO DE YUSO



INTRODUCTION



BEGINNING ACTIVITY



BEGINNING ACTIVITY

PROCESS



RESULT



ACTIVITY ONE

Criteria	Constraints
<ul style="list-style-type: none"> -The platform must float -The platform must withstand as much as possible given the constraints -When loaded,the platform clearance above the water must be less than 10 cm -The raft must be stable -The nest area must be high enough to avoid being swamped by storm waves - It must be harmonious with the surroundings if possible 	<ul style="list-style-type: none"> - Available: <ul style="list-style-type: none"> ● Materials ● Time ● Tools - The size of platform - Cost - Security Issues

1- What

2- Which are the

3- What are the

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problem?

home or at
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ACTIVITY TWO

Main problem: We have to build a floating nest

sub-problems

- 1- It must float
- 2- Stability
- 3- It must be attractive for birds
- 4- Eco friendly
- 5- Waterproof
- 6- Resist the eggs

goals

- 1-Make good answers for the sub-problems.
- 2-Make a beautiful and not dangerous nest.
- 3-The final solution must have all these sub-problems solved.
- 4- And finally make a floating nest with birds and their eggs.



ACTIVITY THREE

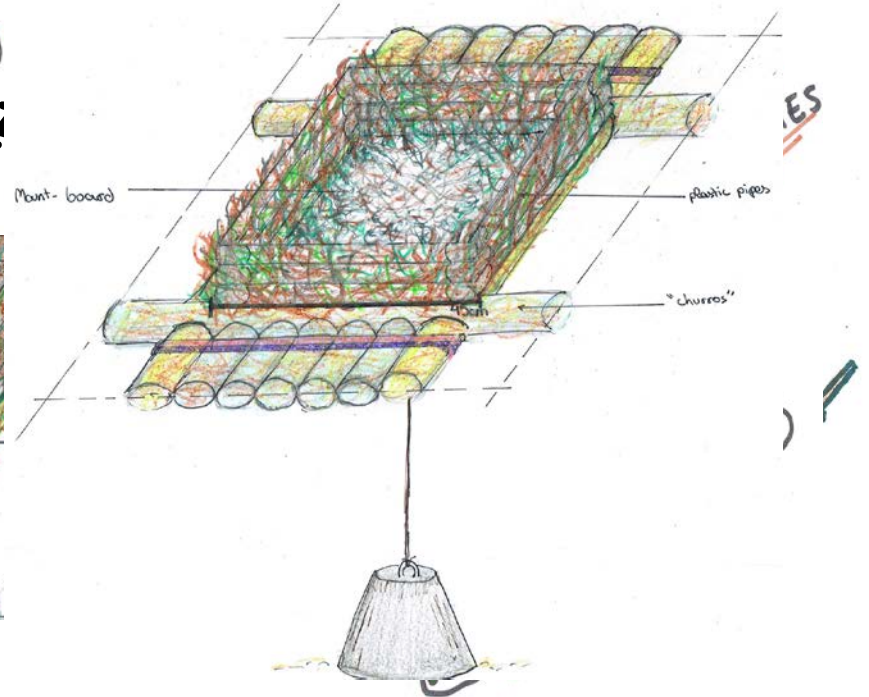
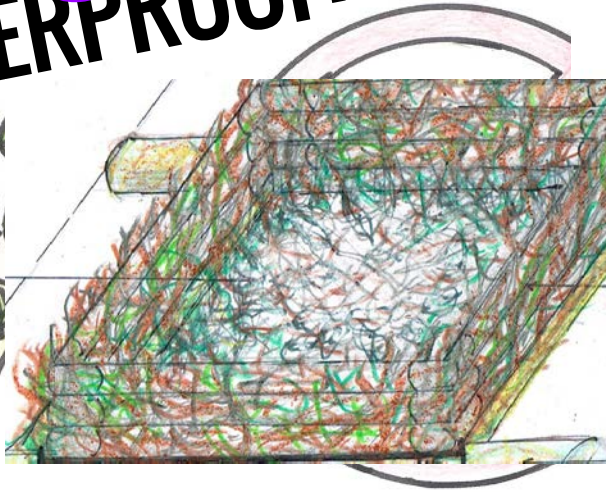
FIRST EXPERIMENT

THIRD EXPERIMENT



ACTIVITY FOUR

IT MUST RESIST
FIRST IDEA:
WATERPROOF



ACTIVITY FIVE

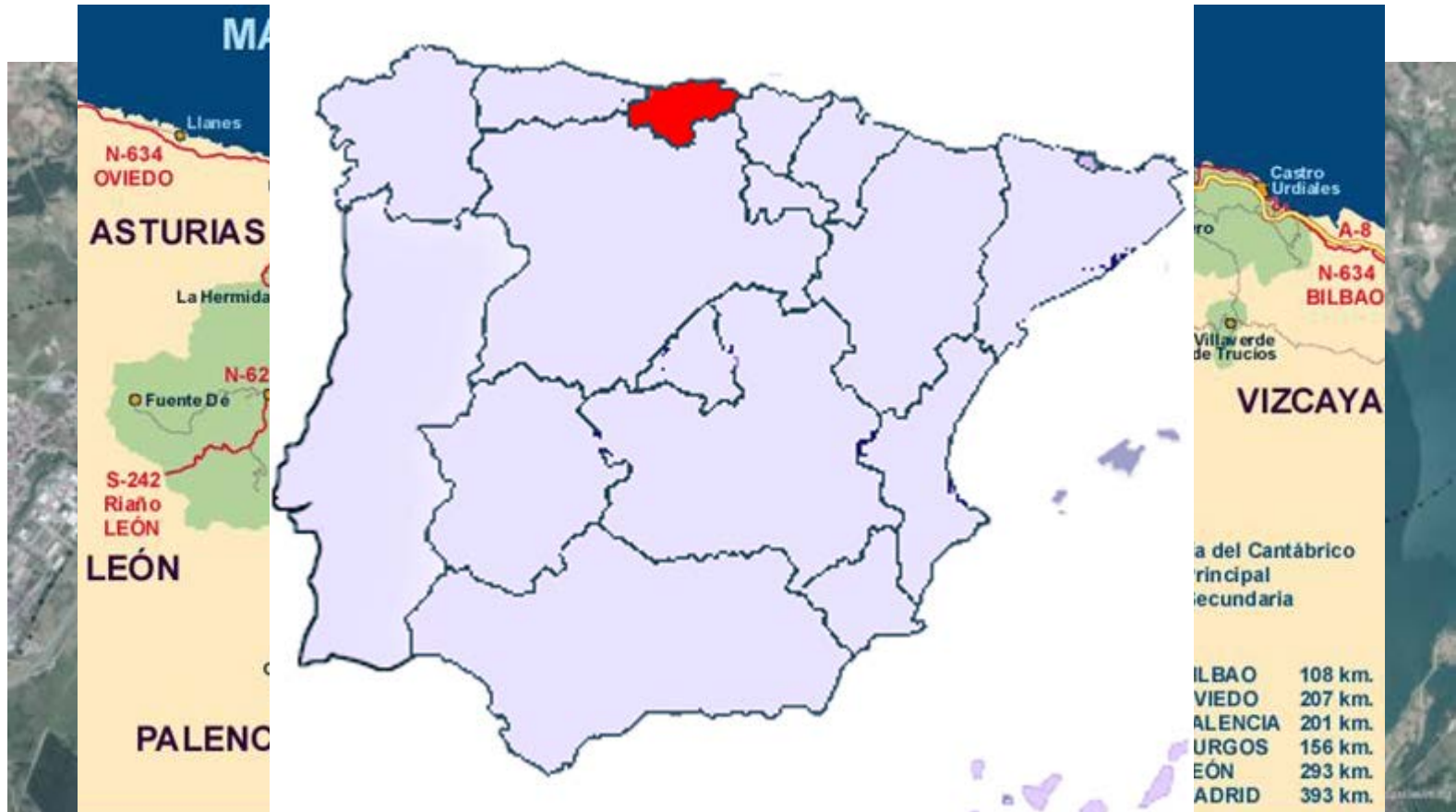
IMPROVEMENTS AND FINAL RESULT



GREAT CRESTED GREBE



LOCATION



WE WENT TO PUT THE NEST ON WATER

First group: Second group: second nest:

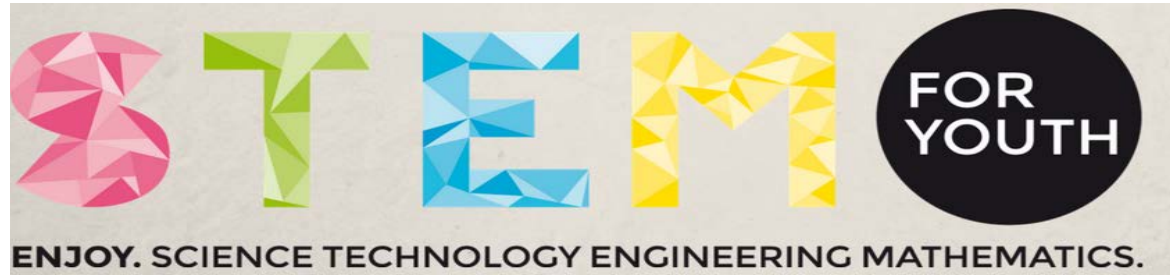


WHAT WE HAVE LEARNED



ABOUT SCIENCE:
EXPERIENCE:





THANK
YOU



Intervención de alumnos

- Colegio San José Niño-Jesús: Aitana Matos Puente y Alberto Bascones de la Arena
 - Diseño y Construcción de una plataforma flotante
- Colegio San José-Niño Jesús: Alejandro Gutiérrez Amigo y Victoria San José Martínez
 - Diseño y Construcción de un Jardín Vertical



VSG

Vertical Sanjo Garden



GOBIERNO
DE ESPAÑA

MINISTERIO
DE CIENCIA, INNOVACIÓN
Y UNIVERSIDADES





VSG

By Alejandro, Jaime, Alejandra and Victoria 1º ESO

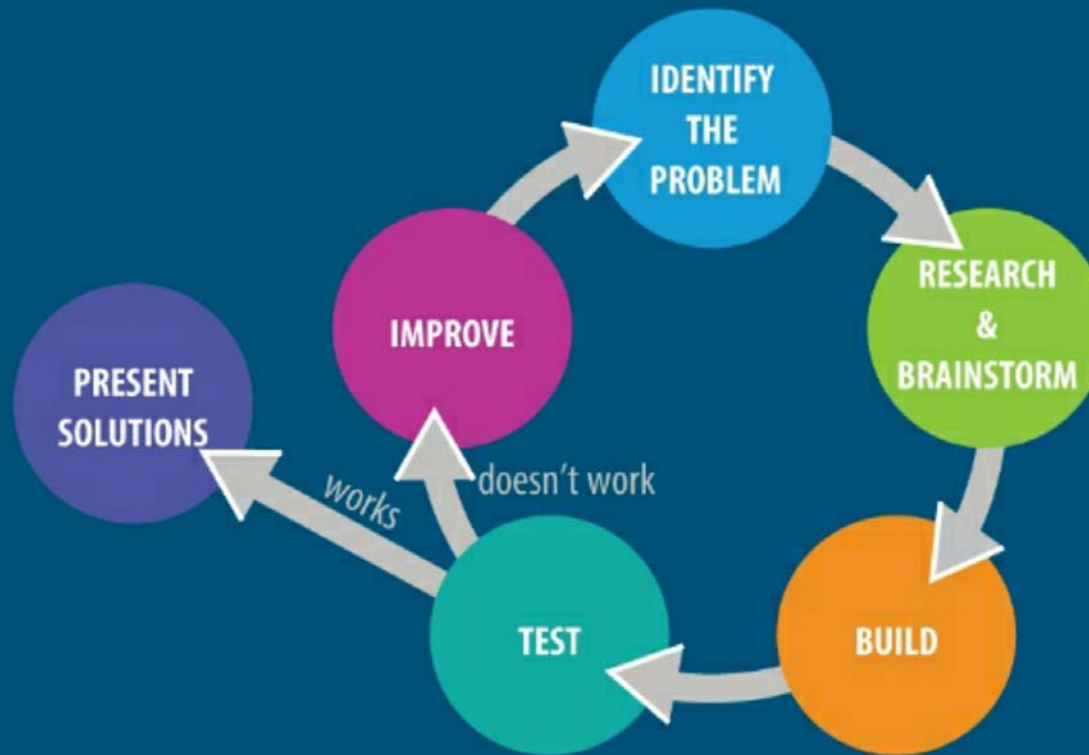
Purpose

In the cities people need oxygen from green spaces but there is no place for setting up parks.

We propose to make our vertical garden using the EDP process.



ENGINEERING DESIGN PROCESS



XYLOPHONE (EDP)

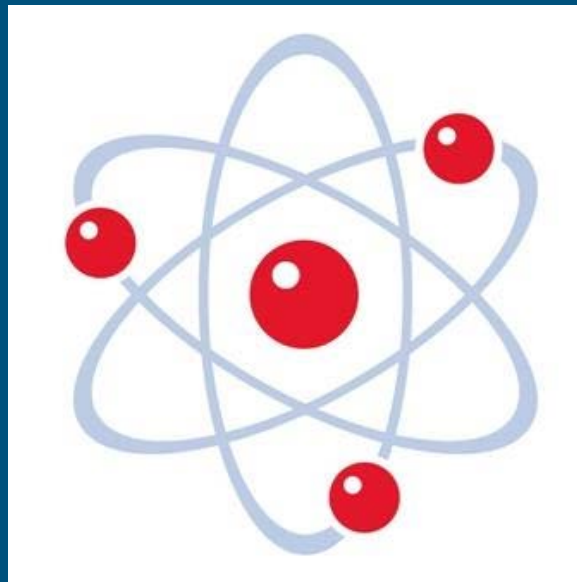
This jar xylophone was the first activity of the EDP process.

We should had to make the song of radio gaga using our own xylophone.



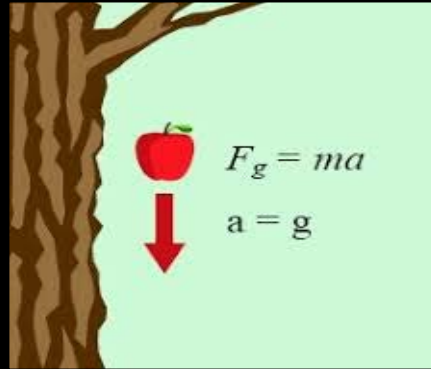
Explore the science

We began the project exploring the science, making proves like capillarity, gravity and more.



Gravity

In this practice, we did some experiments about two balls that we throw it at the same time, and we saw that fall at the same time, we discovered that the gravity force is 9.81m/s^2 .

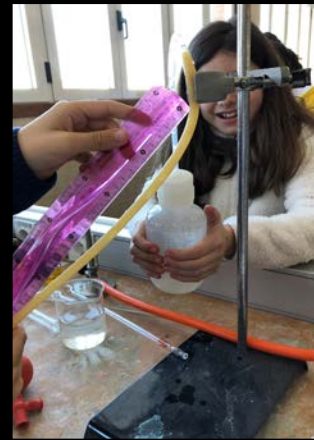
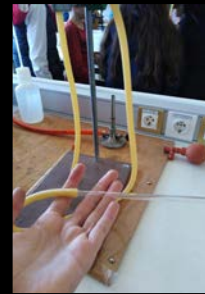
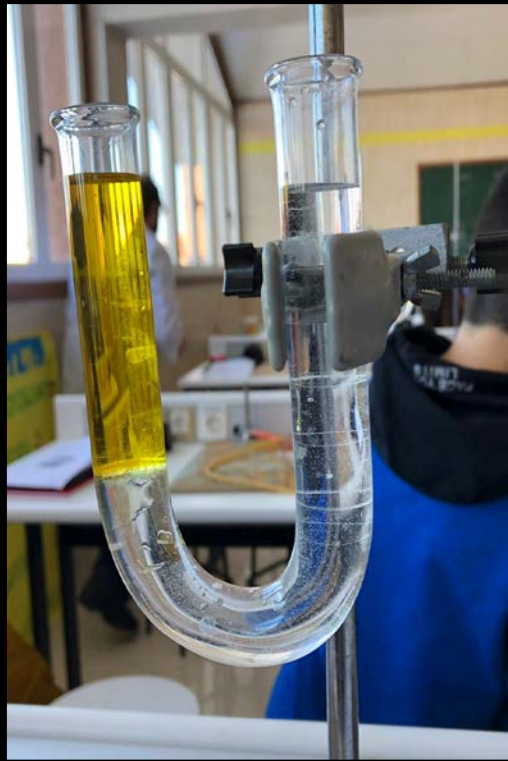


Communicating vessels

In this practice, we did two different experiments.

The first is mix in test tube water with oil and see the difference in the density.

The other was that the water go up and down for a pipe



Capillarity

In this practice there is only one experiment that is about how the water can go up, we put some vessels and water with a different colorant in each one, and in the middle glass mix and made only one



Chromatography

The practice consists on putting some pieces of spinaches in the test tube with water and see its pigments.



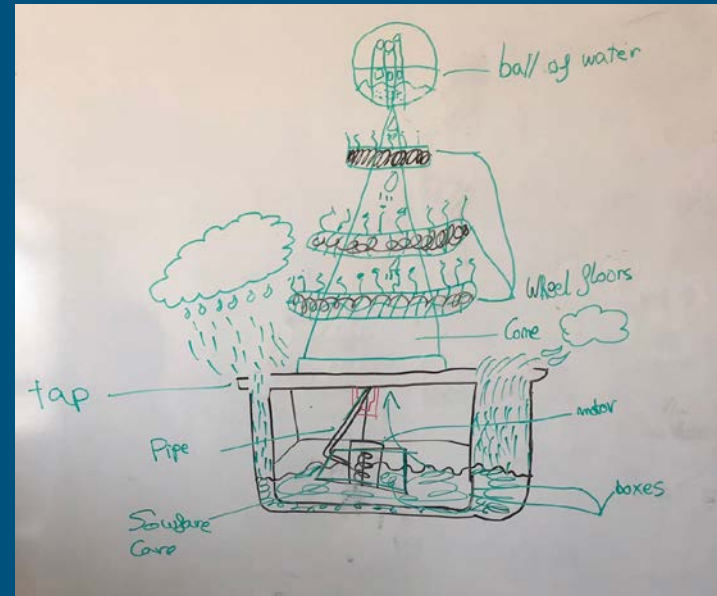
Newton's laws

In this practice we did some experiments about how a balloon can go down because of the gravity and then with some weight inside or different size how length and speed changes.



Prototype

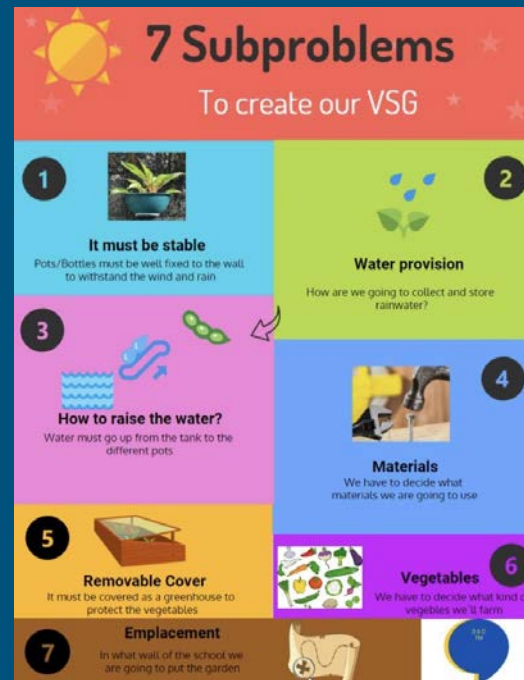
At the first we did the EDP process that teach us how to think like an engineer, first we thought that our model design and if it would work well or not, we follow the EDP WHEEL and we started to identify the main problem, and made also the prototype.



Criteria and constraints

Criteria:

1. It must be stable
2. Water provision
3. Raise the water
4. Removable cover
5. Vegetables
6. Emplacement
7. Beauty



- Constraints
- Self supplying
- Water can go to the plants.
- Gravity/Weight
- Put in vertical/Stability
- Time.
- Size.
- Type of plants.
- Scarcity
- Light
- Protection
- Money
- Materials
- Greenhouse
- Location

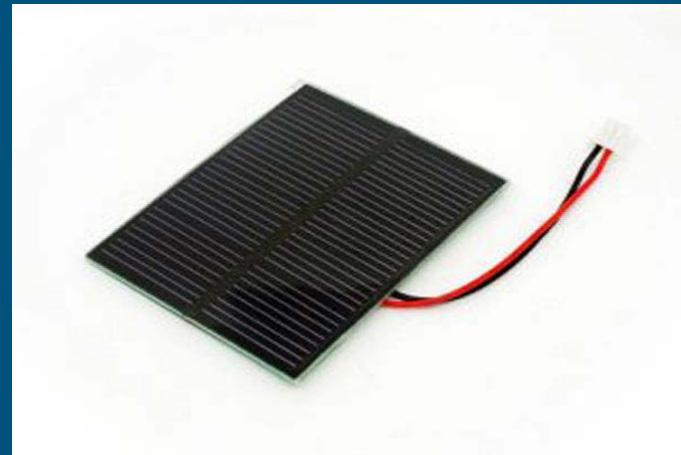
First model



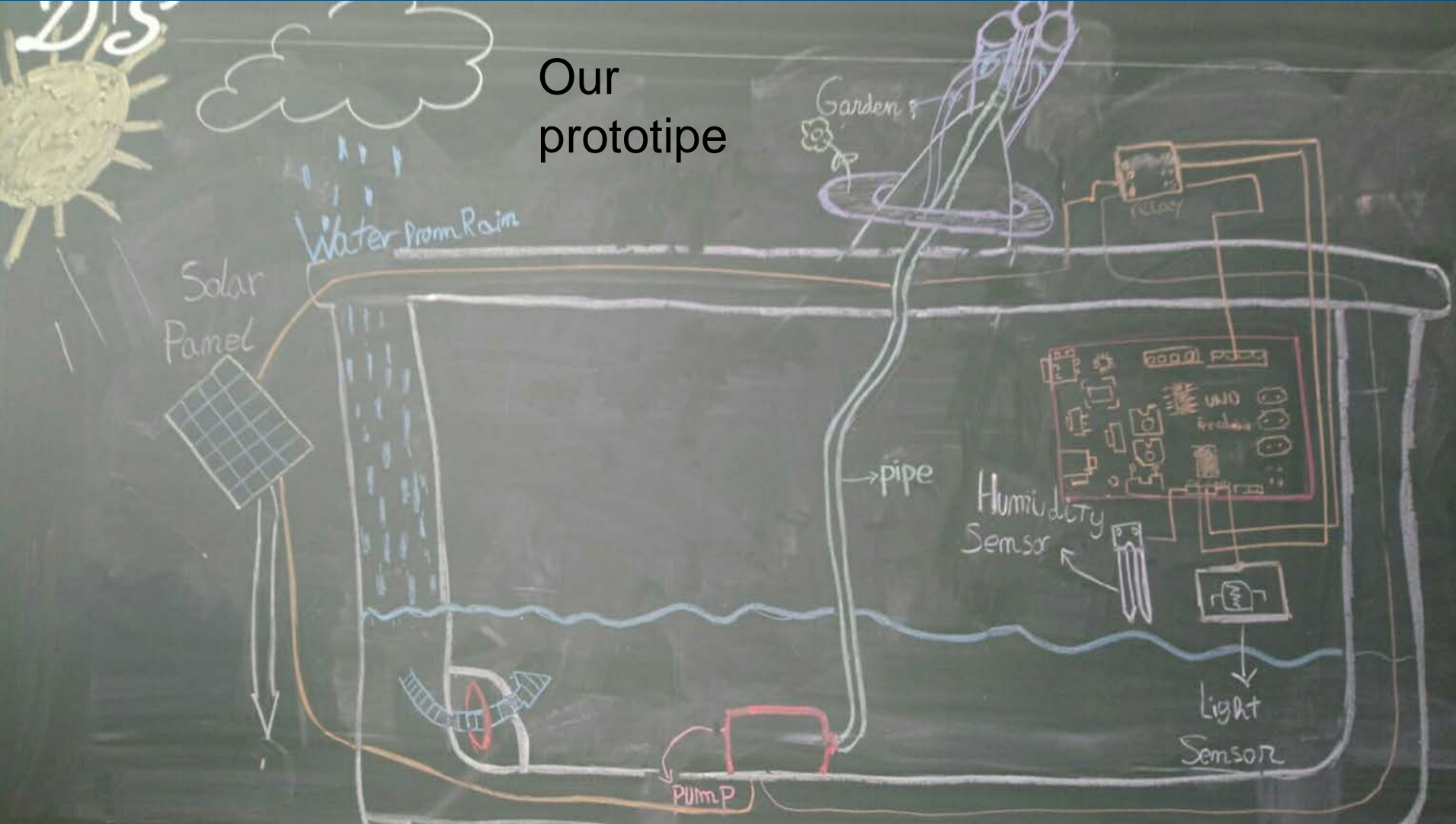
Improvements

We change something in our model, the most important the pump with a relay, also we put a humidity and a light sensors that propert the water when is the time to do it.

Beside we put a solar panel to catch the sun rays, and we put some colorants in the water to simulate nutrients.



Our prototype



Final model

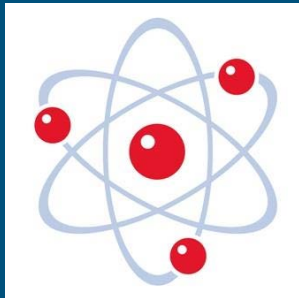
ADVANTAGES:

- IT WORKS WITH SOLAR ENERGY
- IT WORKS AT THE NIGHT
- IT HAS DIFFERENTS FLOORS FOR PUT DIFFERENTS PLANTS
- YOU CAN GIVE NUTRIENTS THAT NEED EACH PLANT
- IS SELF SUPPLYING
- IS QUITE BEAUTY



Conclusions

We think that is an intelligent project whose it can help people that live in huge cities, we prefer to do this project because we learn a lot of engineering, scientific principles, biology and of course English. We have also learnt how to work in groups for next chances and also the EDP process



PRIZES

First Science Fair 2019-Secondary Biotechnology-Prize



Thanks

To David Tejido @davidtejido and Daniel Rucandio @danirucandio (our teachers of biology) for teaching us how to do a great project.

To Manuel Gutiérrez @manureinosa (a physic teacher) for helping us with the project.

To Bruno Palazuelos (a geographer) for helping us.

<https://verticalsanjogardens.wordpress.com>

¡Muchas gracias!

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