

INTELLECTUAL OUTPUT 03

SCIENTIFIC CREATIVITY

4 Creativities Project
№2019-1-BG01-KA201-062354





INTRODUCTION

The aim of FCREATIVITIES project is to improve the teachers' abilities to generate a creative education, leading to the creation of students who are able to think, analyze and solve daily problems. We **will develop new scientific skills** and competencies through the incorporation of new proposals, spaces, methodologies, and resources that will increase the students' ability, creativity and the skills for innovation. These activities will be used **with 10 to 12 years old students**, promoting their motivation and creativity. The activities will be composed for **six working activities** which will contain the different activities that we will elaborate with our students.

With the **scientific creativity** promotion we will improve the thinking capacity of our students and the ability to go from basic notions to more complex ones; they will learn to resolve problems in a real situation; they will practice the construction of their own learning; they will train their **deductive capacity** and this will take them to create strategies and solutions of their own and they will get better with their physical environment and their appreciation from different spaces, shapes, parts and the group in general. Scientific creativity will take place inside the classroom through scientific experiments workshops.

All the **experiments** will be presented in an experiment manual. The format will be a paper card, it will contain all the material that we will need to accomplish the experiment, how you do it, **how it is related to everyday life** and other relevant details.

The experiments that will conform the manual will be the following ones: **bacteria everywhere. Cells. Let's make a periscope. Light and air. Prehistoric illumination. Can we imitate a heart? Global warming.**

Scientific activity will be **boosted through observation, manipulation and research**. That will lead students to discover their immediate environment. Experimental and research activities will offer students the opportunity for learning in an independent and significant way.



Title of the experiment

BUILD A HYDRAULIC ELEVATOR



Description and application in everyday life

Man has used his best muscle to create an invention that could lift great weights for him: the hydraulic lift. I'm sure you've seen it working when your parents have taken the car to the repair shop. They put the car on top of some platforms and lift it up so that the mechanic can check the bottom of the vehicle. The hydraulic lift uses water and other liquids to increase strength and to be able to lift things. The hydraulic lift is based on Pascal's principle, when you push the water with one of the syringes; the same amount of pressure is created in the other one. To move something, not only the force is important, but also the entire area over which the force is made



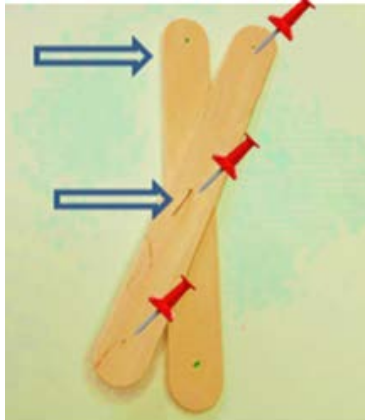
Aims

Please list the objectives you want to achieve...

- 1. They will learn Pascal's principle*
- 2. It's an easy experiment to learn concepts of physics, force, pressure, engineering;*
- 3. In this small work we will learn something about the uses of hydraulics*
- 4. Put it into practice by designing an electric lift (prototype)*

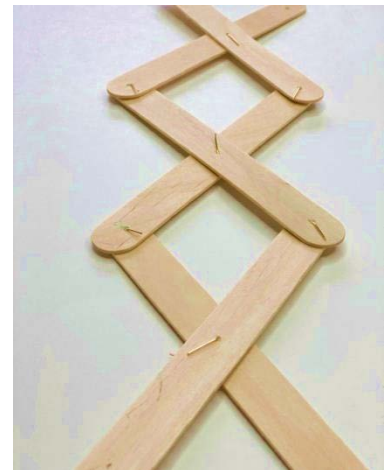


Steps we must follow



1. Use the ruler and pencil to make a sign in the middle and two end points on each ice cream sticks. Use a pin to make a small hole. (as you can see in the picture) Push and turn several times until it goes through the wood. Be careful not to break the stick. . Join the sticks in pairs in the shape of an "X"

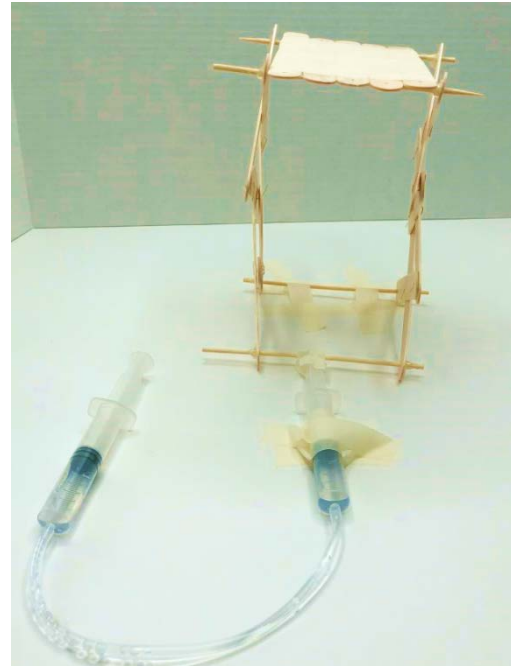
2. When you have the "X" finished place as in the photo. Do this three times. Then connect the two ends of each pair so you have a row of 3 pairs of overlapping sticks



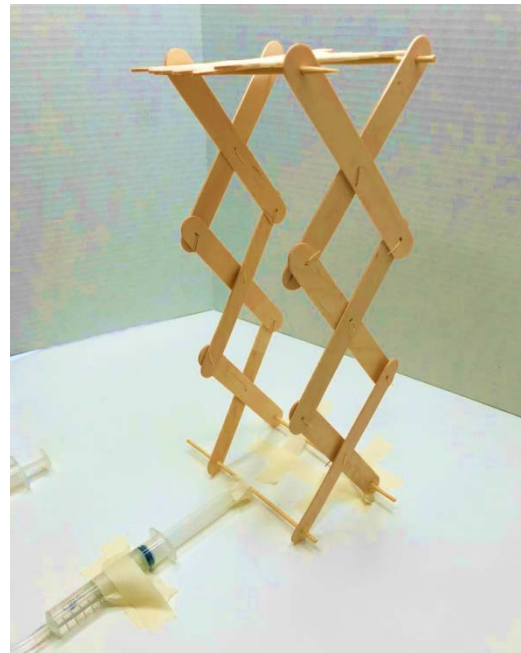
3. Repeat with the other half so you have two moving pieces with 6 sticks in each. On the bottom and top holes, combine the two sides together by putting a wooden skewer through the holes. I used 2 skewers cut in half for this step. I also ended up adding a dab of hot glue where each of the sticks were secured to keep them from slipping out



4. If you want to make a platform for the top of the hydraulic elevator, just tape together 5 more jumbo sticks. Next you will need to secure the bottom back skewer to the surface you are using. I taped it down to the table to keep it in place



5. Get your syringes ready now by cutting a small piece of tubing and attaching it to one tip. Fill the other with water and attach it to the other end of the tube. Once the syringe is prepared, tape one end down to the table as well. The end that slide in and out should be taped to the front skewer. Now when you push the syringe in and out it will lift and lower the hydraulic elevator





Materials needed

In order the teacher to be prepared for the proper implementation make a list of all needed materials and resources needed.

SUPPLIES FOR THE HYDRAULIC ELEVATOR:

- Popsicle Sticks (17)
- Wire
- Wooden Skewers (2)
- 2 – 10 ml Syringes
- Thin plastic tubing



Tips

The teacher can also explain how to make them watch a video like the one below, which explains the whole process to facilitate their work

<https://www.youtube.com/watch?v=YwBJD52swAo&app=desktop>

https://www.youtube.com/watch?v=Xz60Psx_Cp0