

The Daily STEM

Student's favourite newspaper

February 2017

Monthly edition related to the eTwinning project "THE DAILY STEM"

<https://twinspace.etwinning.net/25110/home>

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Cells

(Natalia Cortés 6ºB - Jose María de la Fuente - Spain)

Cells are the basic units of life. They are two types of cells: Animal cell and plant cell.

Both have a nucleus that is the part that controls the cell, a membrane that is the covering of the cell, and cytoplasm. This is a jelly-like material between the nucleus and the membrane and contains organelles. The plant and an animal cell also have similarities and differences. For example: a plant cell is green in the leaves and stems but in the roots or the flower are of another colour. The plant cell has a cell wall that is an extra support for the cell, the plant cell also has chloroplasts that help to do the photosynthesis, an animal cell has mitochondria, that uses O₂ to transform into energy, also an animal cell has vacuoles, these store temporarily necessary substances for the cell and finally an animal cell has ribosomes, these create protein for the cell.

ROCKET

(Ali Murat Çivi- TURKEY)

Materials:

Vinegar, carbonate (soda), pet bottle, stopper

Experiment topic: Gas outflow in chemical reactions

Test content: Interaction of acid and carbonated compounds

Logo designer: Elaia Elorduy

(Elaia Elorduy - Larramendi Ikastola - Basque Country)

I'm Elaia and I'm 13 years old. I'm from the Basque Country, a region located in the Northeast of Spain. I like drawing, therefore I decided to take part in the logo competition. When I saw that I was the winner, I was really surprised. My classmates help me a lot, voting my logo. I thank for that. Now I'm waiting for your questions. See you soon.



Flotation column

(Joane Orbe, Ibai Rapado, June Cuezva, Endika Belaustegi, Izar Sistiaga, Jon Lopez, Maider Hueda and Maialen Rekalde - Larramendi Ikastola - Basque Country)

Materials:

- 7 liquids: petrol, condensed milk, olive oil, water, soap, honey and dyed alcohol
- A graduated cylinder
- A small funnel

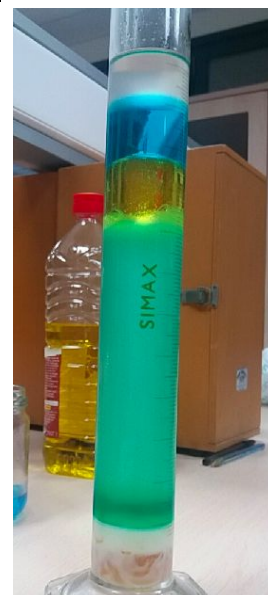
Procedure:

Pour water into the graduated cylinder and fill the cylinder approximately half way.

Then pour these liquids in this order into the graduated cylinder:

- A little condensed milk
- A little honey
- A little soap
- A little olive oil
- A little dyed alcohol
- A little petrol

Results:



ROCKET EXPERIMENT

When the vinegar and the carbonate pet are mixed in the bottle, there is a gas jam. Stopper, rising



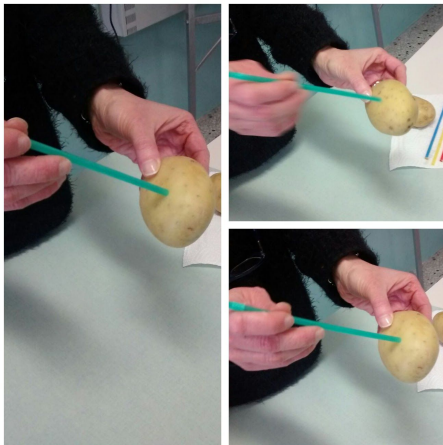
<https://www.youtube.com/watch?v=OaO5H3DjK8o&t=11s>

The super straw and the fragile potato

(Junior High School of Monte Sant'Angelo-Italy (6th grade class B))

Will a fragile plastic straw be able to pierce a potato without bending? It seems an impossible task, which one will win? Let's find out with this simple experiment.

Push a straw inside a potato trying to pierce it. What can you observe? As you imagined, the straw doesn't succeed in entering, on the contrary it tends to bend.



Now take another straw, and strongly press it between your thumb and the index and with a quick and firm movement push it against the potato. This time, what happens? Magically, the fragile plastic straw stays straight and succeeds in piercing the potato without any difficulty.

The explanation of this phenomenon is the following: when you tighten strong the straw,, the air to its inside

Hello Elaia, I am George from Greece. Congrats for your painting it is really great! I would like to ask you:

Are you enjoying STEM courses in your school?

What sector you will follow for your future job?

What is your favourite experiment?

Hello George, thank you for congratulating me because of my drawing. Yes, we are enjoying STEM project. Although in this moment I don't know what I'm going to dedicate myself, but I suppose that I'd like to be an interior designer. My favourite experiment is "Christmas Colours", because I think that it is so cool.

Hi logo designer, where are you from?

I'm from Bakio. It is a town close to Bilbao (Spain).

Hi logo designer, when you presented your logo, did you think that you'd win? Bye bye and answer me

No, I didn't.

Hi logo designer, how long did it take you to draw it ?

An afternoon.

Hi logo designer, how did you have the idea for drawing that logo?

I took an icon of each subject that I thought that identify them.

Hi Logo designer, are you happy because you win? Congratulations , bye bye :!!!!

Yes, I am really happy.

Bouncing raisins

(Jia Hui Xu, Itziar Loizaga, Iñigo Iglesias and Sare Monasterio - Larramendi Ikastola - Basque Country)

Materials:

- Raisins
- Water
- Sodium bicarbonate
- Vinegar
- A jar
- A spoon

We can distinguish the liquids depending on their density. The liquids which has a higher density, they are located deeper in the flotation column. On the other hand, the liquids with lower density, they are located higher in the flotation column.

From higher density to lower density, the liquids arrange this way: honey, condensed milk, soap, water (green coloured), olive oil, dyed alcohol and petrol.

The magic paper

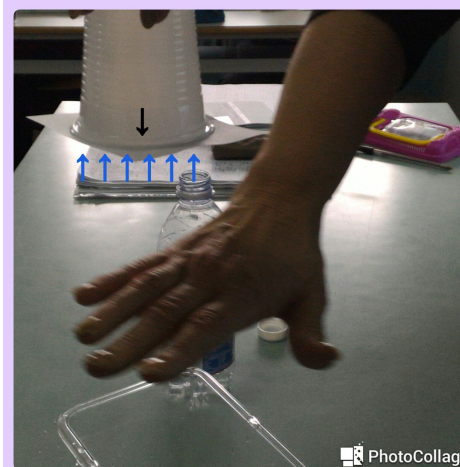
(Junior High School of Monte Sant'Angelo-Italy) (6th grade class C)

Can a sheet of paper prevent water from falling off a drinking glass?



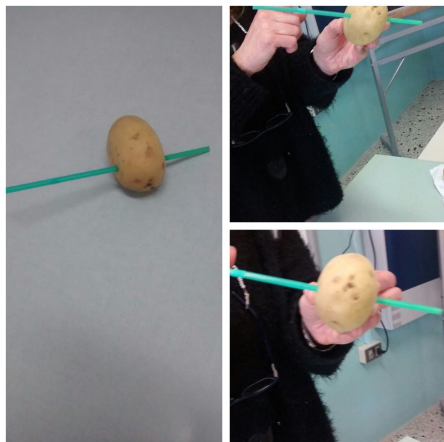
Try it you will be surprised.

Fill a glass up to the brim, then put on the glass a sheet of paper. Now lay your hand on the sheet and turn the glass upside down. Slowly remove your hand and **MAGIC of the MAGICS the paper does not fall.**



The magic is easily explained with science! The atmospheric pressure is an

cannot go out and it becomes increasingly compressed as the straw enters the potato. Actually it is the compressed air that makes the straw more rigid and does not make it bend.



The eater bottle

(Naiara Villegas, Gaizka Munner, Oier Arrieta, Ibon Iturraspe, Jon Caceres, June Garai and Haizea Fernandez - Larramendi Ikastola - Basque Country)

Materials:

- A boiled egg
- Cotton
- Alcohol
- An erlenmeyer flask
- A lighter
- Laboratory pincers
- A water balloon

Procedure:

Firstly, wet the cotton in the alcohol. Then, using the lighter, light the cotton on fire and put it into the erlenmeyer flask. After that, put the egg in the mouth of the erlenmeyer flask.

Results:

After a few seconds, the fire turn off and the egg goes inside the erlenmeyer flask little by little.

When the external pressure is bigger than the internal pressure, the egg is pushed by the external pressure into the erlenmeyer flask.

Procedure:

First of all, we pour 50 mL of water into the jar and then immerse some raisins there. After that, pour 200 mL of vinegar into the same jar and add a spoonful of sodium bicarbonate. Finally, we mixed measuredly everything. Observe the raisins.

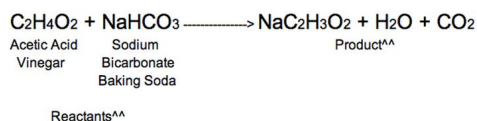


Results:

A chemical reaction occurs between the vinegar and the sodium bicarbonate. A new product is produced: carbon dioxide. Thanks to the carbon dioxide, the raisins move up and down into the jar. When the raisins and the carbon dioxide join together, the carbon dioxide tends to go to the surface in order to be released and the raisins climb to the surface.

When the carbon dioxide releases, the raisins immerse again to the bottom of the jar and there, they join to some carbon dioxide molecules. The cycle starts again.

This is the chemical reaction that occurs here:



Here you can see [the video](#)

air force that pushes in all directions with an intensity of 1 kg on every cm² of surface. In the drinking glass there are 100 cm³ of water, which push by gravity with a force of 100 g downward, while the atmosphere pushes upward the paper (surface 7 cm²) with a strength weight of 7 kg.

<https://www.youtube.com/watch?v=iGIZXiT2ias>

The aspirator ghost

(Junior High School of Monte Sant'Angelo-Italy)
(6th grade class A)

Who is the aspirator ghost?

To find out, let's make a simple experiment together.



Take a dish and pour some colored water, then light the candle placed in the center of the dish and cover it with a glass. Now look closely at the water level in the glass: it rises quickly.

Why does the water rise?

Does the aspirator ghost start working? Not at all! Let's look for a scientific explanation: in the glass the combustion of the candle stops when it consumes the whole oxygen (combustive) and contemporarily it heats the air. The warm air has a lower pressure than the cold air outside and this pressure difference creates the push of water in the glass, causing it to rise.



Here you can see [one video](#)
 Here you can see [another video](#)

We tried the same experiment using a water balloon. In this case, the erlenmeyer flask broke, due to filling the water balloon using too much water. The balloon must've been smaller than the erlenmeyer flask's mouth.

Here you can see [the video](#)

At last but not at least, the other way around. We wanted to get the boiled egg back. How could we do it? Just blew away deeply in the erlenmeyer flask's mouth and the egg would leave the flask.

Blowing away, we are increasing the internal pressure and this pressure pushed the egg. Hence, the egg left the flask.

Here you can see [the video](#)

[Hologram with a cd case!](#)

(Junior High School of Thermi- Greece)

You can easily project a 3D hologram with a plastic pyramid on a smartphone, follow the instructions...



[We can float better in the sea than in a swimming pool](#)

(Olatz Armendariz, Ibai Celaya, Mikel Ortega, Izaro Perez, Julen Monclova, Jon Urrutia, Alize Roman and Iam Moreno - Larramendi Ikastola - Basque Country)

Materials:

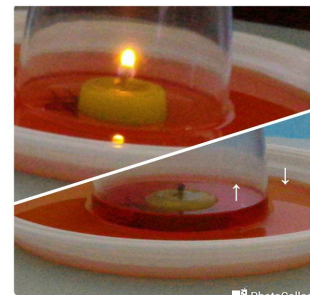
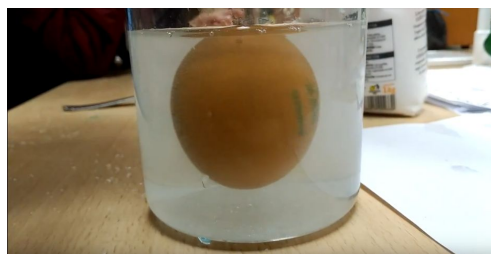
- A beaker
- An egg
- A teaspoon
- A tablespoon
- Food coloring
- Salt
- Water

Procedure:

We pour tap water into the beaker. Using a tablespoon, we drop carefully the egg into the water.



We add ten salt teaspoons to the water and stir it, in order to dissolve the salt.



So we can conclude that in fact **the aspirator ghost is the difference of atmospheric pressure.**

<https://www.youtube.com/watch?v=m3tsf7aw3ZY>

[Endothermic vs. Exothermic Reactions](#)

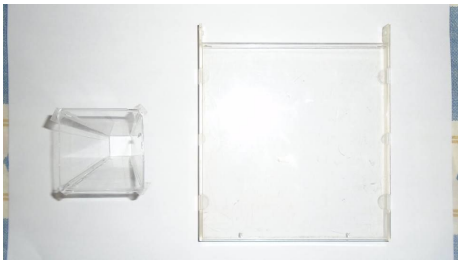
(B3 & B4 Class – 1st Junior secondary School of Xanthi - Greece)

1st experiment: We use vinegar, baking soda, a beaker and a thermometer. We pour vinegar into the beaker. The temperature is 14°C. We add the baking soda and bubbles of carbon dioxide appear. The temperature drops at 10°C.



2nd experiment: We use hydrochloric acid solution, magnesium powder, a beaker and a thermometer.

We pour hydrochloric acid solution into the beaker. The temperature is 14°C. We add a pinch of magnesium and bubbles of Hydrogen appear. The temperature climbs at 20°C.



In another beaker, we mix tap water and yellow food coloring. We pour the mixture slowly onto the salted water.



Results:

An egg in salted water floats. However, after pouring tap water with food coloring in it, the egg stays in the middle. The liquid with the highest density (salted water) stays at the bottom and the tap water with food coloring on top, due to its lower density.



<https://www.youtube.com/watch?v=k5mc3sd2Mco>

<https://www.youtube.com/watch?v=SKIdY-cOAz0>

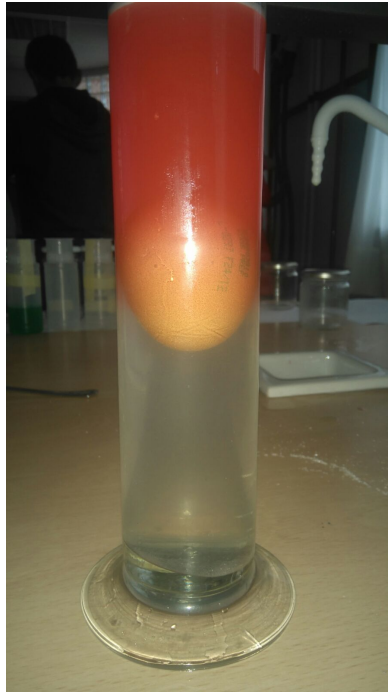
<https://www.youtube.com/watch?v=uSzly8E5qsE&feature=youtu.be>



Explanation: In both experiments chemical reactions take place.

In the 1st experiment the reaction is endothermic. Endothermic means that during the reaction, molecules have moved from a lower state of energy to a higher state, the system gains heat as the surroundings cool down.

In the 2nd experiment the reaction is exothermic. An exothermic reaction is the opposite of endothermic. This is when a reaction starts hotter and ends up colder, taking in energy from start to finish.



As you can see in the pictures, we use red and blue food coloring as well, apart from the yellow one.