

The Daily STEM

Student's favourite newspaper

October 2016

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

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

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[Crystal salt in the lab](#)

(Junior High School of Thermi - Greece)

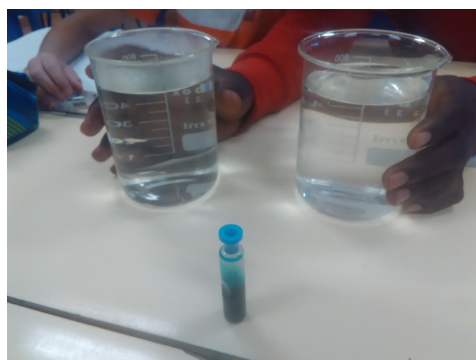
We forgot salt water in a lab's closet. After 6 months of slow evaporation the salt crystallized in cubes.



The crystal cubes

[Kinetic theory of matter](#)

(Agrupamento Pedro Eanes Lobato - Portugal)



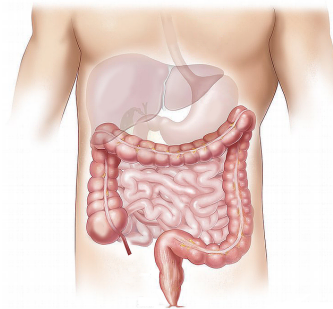
Food coloring in beakers with hot/cold water
Our students began the study of the kinetic theory of matter. Can the particles of food coloring move through water by themselves? What happens if you use hot water? Try this at home and find the answer!

[Have you ever thought that we have a second brain?](#)

(CEIP José María de la Fuente - Spain)

It's true, the small intestine is our second brain, and its neuronal function is very similar to the brain activity of the head. The structure of digestive neurons is completely identical to the brain's one, and has the ability to release the same neurotransmitters, hormones and chemical molecules. The digestive process affects to our emotions and feelings. For example, according to the magazine 'Science', we are more aggressive when we have an empty stomach.

Article written by Elvira Santamaria (6th grade A)



[Oxygen in soil](#)

(Junior High School of Thermi - Greece)

Typical soil mineral materials are Quartz: SiO_2 and Calcite: CaCO_3 . Can you believe that approximately 50% of the soil is oxygen!!!

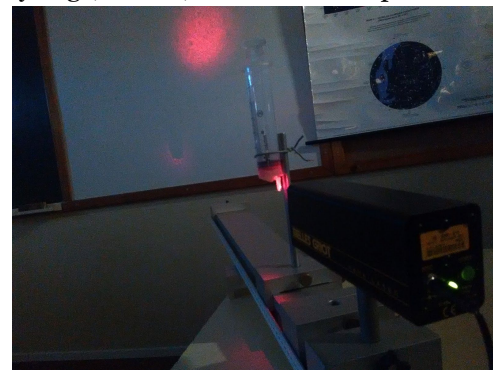


soil

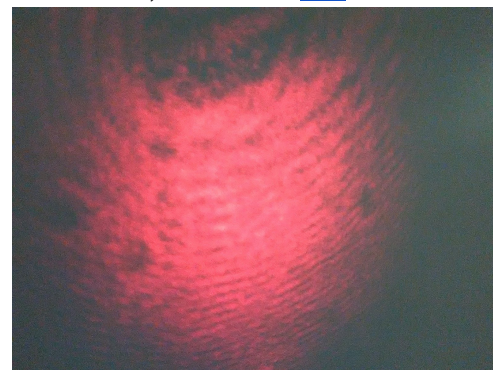
[Laser microscope](#)

(Agrupamento Pedro Eanes Lobato - Portugal)

Our students are learning about cells and microorganisms in Biology class and how to use a microscope. The Physics teacher stepped in and showed to the students how to build a simple microscope using a syringe, a laser, and a water drop.



Try this at home! If you need more information, look at this [link](#).

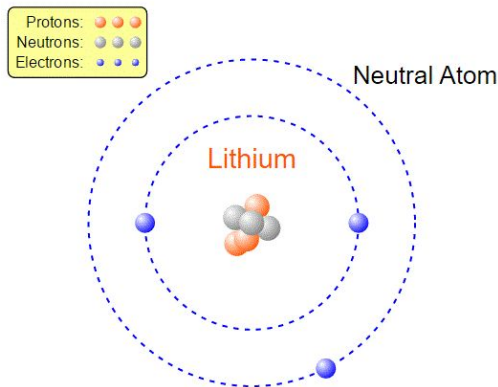


Laser projection of microorganisms in a water drop.

Ions? What are they?

(Agrupamento Pedro Eanes Lobato - Portugal)

Our students should know everything about ions. What are they? First, we looked at an atom simulator and found out what makes up an atom. You can also do this! Click in this [link](#). You will be taken to the PHET "Build an atom" simulator.



Build a lithium atom. See that last electron? That is the one that is lost so that the metal converts into a lithium ion (Li^+). No wonder lithium batteries are used in mobile phones. This is the lightest metal and is adequate to generate an electric current!



Lithium metal

Collapsing soda can

(Agrupamento Pedro Eanes Lobato - Portugal)

On the subject of kinetic theory of matter, what happens when a gas is suddenly cooled? In this experiment a empty soda can is heated with some water inside and then quickly cooled in a bowl of water.



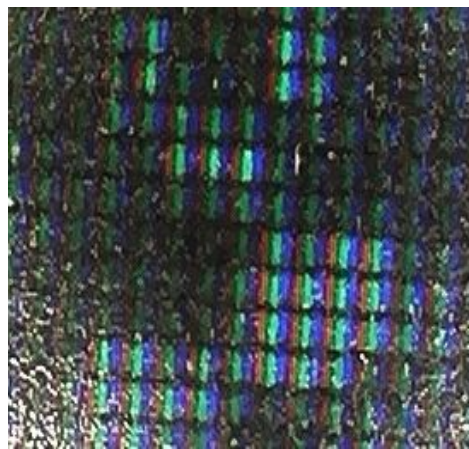
As the water vapor cools down, condenses into liquid and the pressure inside the can decreases (the can aperture is closed by immersion in water). What crushes the can? Can you guess why?

Colour vision

(Junior High School of Thermi - Greece)

This picture which has been taken via portable microscope clearly shows the pixels on laptop's screen. Each pixel has three colours red, green and blue. By combining these three colours a screen can project all the images.

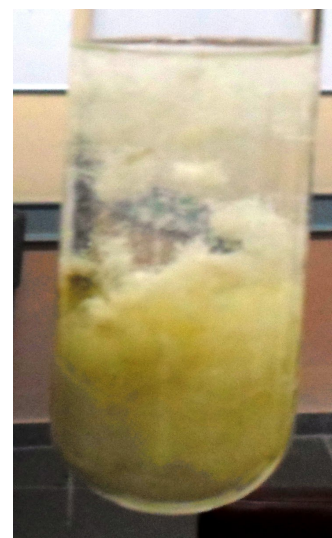
[Phet](#)



Screen pixels

Banana's DNA extraction

(Junior High School of Thermi - Greece)



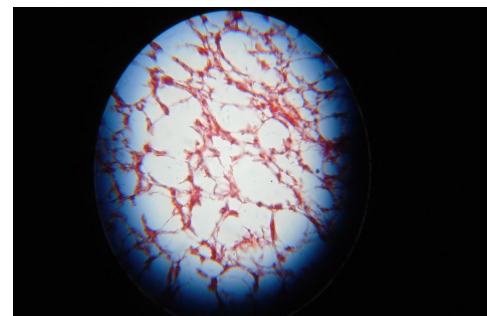
Materials: banana, dishwashing liquid, salt, water, cold alcohol.

Melt half of a banana in a plastic bag. Dissolve in a glass one teaspoon of dishwashing liquid, half a teaspoon of salt and then add 100 ml of water. Pour half of the solution in the bag, mix well and transfer some of the mixture into a test tube. Finally, add alcohol slowly to laminate the two liquids. DNA leaves the aqueous solution and moves to the alcohol because it is hydrophobic. Wow... it's white and it feels like cotton!!!

Human Histology

(Junior High School of Thermi - Greece)

During Biology classes we took this wonderful photo of the spinal cord's nervous tissue. The neurons of the spinal cord are responsible for human reflexes.



Nervous tissue

The marathon of the bodies

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

We took two identical sheets but we crumpled one. Then we dropped both at the same time and from the same height. We noticed that the crumpled sheet fell faster.



Next we took two identical spheres and dropped them in two bottles (one filled with air and the other filled with water) at the same time.

We realized that the sphere, dropped in the bottle filled with air, fell faster than the other one.

Thanks to the results of these experiments we understood that gravity is not the only force

that acts on the falling bodies. There is in fact another force which opposes the gravity: friction.



Extraordinary edition

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

In Monte Sant'Angelo, exactly in class 1st C of Giovanni XXIII School, we have discovered that the air is there but you can't see it, try it yourself:

Put a ping-pong ball in a bowl of water.



The ball floats, then take a bottle, cut the bottom on one side and close the other. Push the bottle on the ball and the water surface. Magically the water does not enter the bottle but is pushed to the bottom of the bowl with the ball, because there is air in the bottle and water can't enter.



Remove the cap and you can see that the water and the ball in the bottle go up because there is no more air. Then, close the bottle again and pull it slowly and surprise! The water and the ball go up to the bottle since the air comes up from the bottom.



Let's have fun with soap bubbles today!

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

Do you know that bubbles are not all spherical? Create them with me.

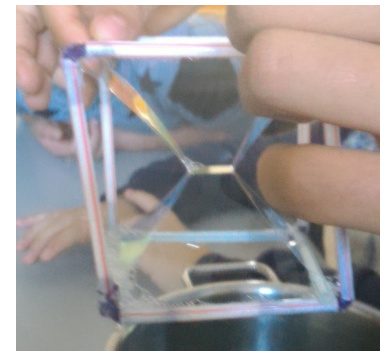
Take a pair of scissors and cut 16 pieces of straws, 8 cm long, and 16 pieces of rope, 6 cm long. Bent the rope at right angles and insert it in the straws. Fix it with hot glue.



Have you built a cubic straw cage? Well, let the glue dry for 24 hours. The next day, take a high edge bowl filled with water and pour a cup of detergent. Dip the cubic cage and then pull it out ...

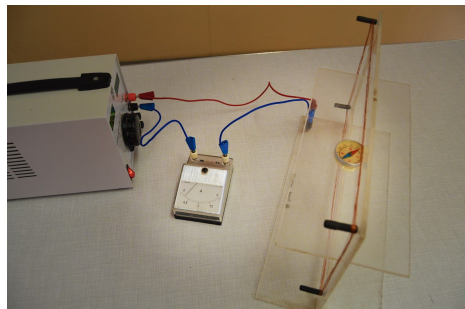


How wonderful! Layers of soapy water, reflecting the colors of the rainbow, assume the strangest geometric shapes inside the cage. The most wonderful is the hourglass one. Discover the others by yourself!



The definition of the horizontal component of the magnetic induction of the Earth

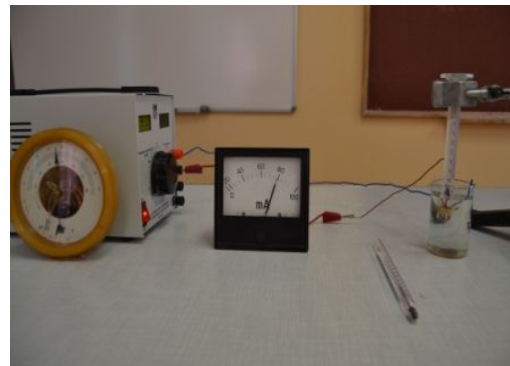
(Dolynska Gymnasium #3, experiment conducted by Pavlo Laskuryk and his students - Ukraine)



We made the magnetic field created by current-carrying conductor and magnetic field of the Earth equal in magnitude and oriented in mutually perpendicular planes, then the compass needle turned to a 45 degree angle. After calculating the magnetic induction created by current-carrying conductor we determined the magnetic induction of the Earth.

Electric current in electrolytes

(Dolynska Gymnasium #3, experiment conducted by Pavlo Laskuryk and his students - Ukraine)



We extracted hydrogen by electrolytic method by passing current through the weak solution sulfuric acid.

Non Bursting Balloon Experiment

Thought Questions

Is all of the same tension when a balloon inflated? Materials: Balloons, skewers, liquid soap, needle

Practice: A balloon is inflated to the medium. Balloon top and bottom of the balloon by skewers As shown in the figure is passed from blasting. When the balloon bursts puncture. However, liquid soap is applied to the top and bottom of the flask. Then it is seen that bubble burst when the balloon dipped skewers.(balloon has a flexible structure. surface tension increases when inflated. Despite their ends tension less.Each point of the balloon does not have the same tension)

Result: The middle section of the inflated balloon stretched, the upper and lower portions are shown to be less intense. When the bottom and from the top of an appropriately skewers dipped balloon usually fire.Because the voltage to tear openings in this section is not so much.

My student experiments:

<https://www.youtube.com/watch?v=wnb8mORmpGk>

Connection with Life: - Maximum current portion due to the high pressure of vehicle tires is the weakest part of the side. - It must be applied too much pressure to the explosion of football or basketball ball.

