

The Xmas STEM



Student's favourite newspaper

December 2016

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

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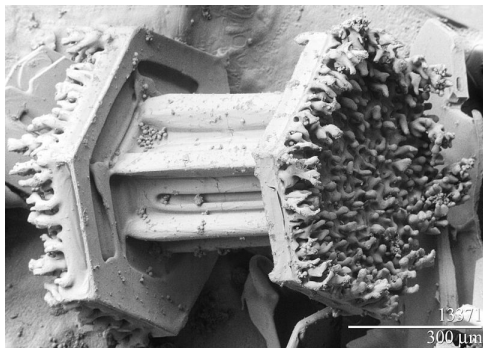
Merry Christmas Wishes

From miles away, no matter how far we are, the warmth of Christmas will bring us closer together. May you have a wonderful holiday!



How snowflakes are formed?

(Junior High School of Thermi - Greece)



Snowflakes nucleate around mineral or organic particles in moisture-saturated, subfreezing air masses. They grow by net accretion to the incipient crystals in hexagonal formations. The cohesive forces are primarily electrostatic.

<https://en.wikipedia.org/wiki/Snowflake>

Snowball Physics

(I. Karageorgiou, A. Katefidis, G. Lazaridis, M. Kapetanopoulos, C. Loukas – 1st Junior Secondary School of Xanthi - Greece)

In winter, making snowballs is a favorite among most kids (and adults). Whatever your technique to make the perfect snowball is, one thing is common. You compress the ice crystals. Instantly the snow melts from a solid into a liquid, but as you release the pressure, it turns into a solid ball.

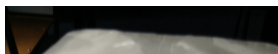
Here is a cool experiment to demonstrate this behavior. We placed a fishing line with



four bottles tied to each end on a piece of ice. After some time, it seems as if the fishing line is phasing through the piece of ice!

As the fishing line is placed on the ice, it applies pressure to it. Pressure decreases the melting point of a substance, so the ice melts into water.

The fishing line, due to the force of gravity, sinks and goes deeper in the



The snow crystals

("Giovanni XXIII" Secondary School Class 1th A-Italy)

Guys we had fun to dress a Christmas tree made by recycled material. Do you want to do it with us? Take a piece of cardboard large 1 m² and make six concentric circles. Colour them with a can of green spray paint. Then put them one on the other, spacing 25 cm from each other with the clear nylon thread.



Gravity Measurement



We measured the period T and the length L of our pendulum.

$$L = 0.33\text{m} \quad T = 1.18\text{ s}$$

According to the formula $T = 2\pi \sqrt{L/g}$

We calculated the gravity $g = 10.9\text{ m/s}^2$.

We should have found 9.8 m/s^2 . Our method is not accurate.

Marine Antonin and Terry Jean Monnet school France

Christmas Colours

(Maidier Momoitio, Naiara Villegas, Elaia Elorduy, Itziar Loizaga, Izaro Perez, June Cuezva and Endika Belaustegi - Larramendi Ikastola - Basque Country)

We place green and red M & Ms on a plate and then we pour hot water into the plate and on top of the green and red M & Ms as well. After that, we observe what happens:

At the beginning



In the middle of the experiment

ice. When the pressure is gone, the water refreezes. This happens until the wire reaches the bottom of the ice. This phenomenon is named **Regelation** and is also the reason why glaciers flow like rivers.

<https://youtu.be/rlsil3iCow>

Ice cube Fishing with a Freezing Point Experiment

(M. Kiosse, E. Kralli, K. Koutava, D. Malliarou – 1st Junior Secondary School of Xanthi - Greece)

Here is a quick and easy ice cube fishing experiment. We will use only a thread and salt to lift an ice cube. For this experiment we need ice cubes, salt and a thread or small string.

Here is how you do it:

Place an ice cube on a plate.

Put the thread on top of the ice and sprinkle some salt on it.



Press it for a few seconds.



Let it sit for 1-2 minutes.

Carefully lift the thread. It's gotten stuck to the ice cube!

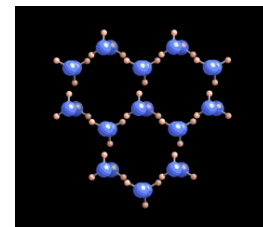
What is going on? Water freezes and becomes ice when temperature is equal to or lower than 0°C .

When salt is mixed with ice it lowers the freezing point, causing the ice to melt.

However, when it is used in such a small amount, like in our experiment, the water around the ice freezes again quickly. This means that the string gets trapped as the

Do you want to dress it? You can copy the SNOWFLAKES, natural art works, using both the technique of origami and the bottoms of plastic bottles.

Speaking of Snowflakes: did you know that around a speck of atmospheric dust the water molecules form hexagons or prism with hexagonal base, that laying on, form these extraordinary jewellery?



images from:

<http://www.snowcrystals.com/science/science.html>

Nature is certainly a "mathematician"; in fact it uses maths in many of its works. The enlarged snowflakes are wonderful sculptures that can be used to decorate at Christmas time.

Ps. Remember no snowflakes look alike!



Images from:

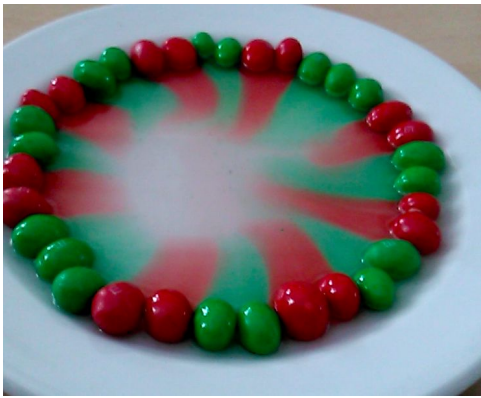
<http://www.snowcrystals.com/identicaltwins/identicaltwins.html>

MERRY CHRISTMAS

CHRISTMAS IN ITALY: "PANETTONE" AND SPARKLING WINE

("Giovanni XXIII" Secondary School Class 1th C-Italy)

"Panettone" is a typical Italian sweet bread, usually prepared and enjoyed at Christmas.



At the end



The result has been very attractive and colourful.

Merry Christmas to all!

Here you can see the entire [video](#)

THE AQUATIC DISCO

("Giovanni XXII" Secondary School Class 1B-Italy)

It's the holiday season. Christmas is coming and soon we will celebrate the New Year. Surely you celebrate it with fireworks, as we do.

In class we have succeeded in reproducing fireworks in the water, creating the effect of a colourful underwater disco.

Now we'll show you how: in a jar of glass pour some water up to almost entirely fill it. Then add some oil. As we already know, the oil doesn't mix with water and it floats on it because it is less dense.

After that add very slowly a few drops of coloured water of different colours: red, yellow, green and blue. Water has previously been coloured from us using some food colouring.

At first the coloured drops are trapped in the oil without mixing with it, nor with each other

water around it refreezes, thus making it stick to the ice. Now we can lift the ice cube using the thread.

So, what are you waiting for? Got ice? Try it!!! <https://youtu.be/pn7YPloSWTU>

SNOW METEOROLOGY

(Jorge De La Ossa - 6th A - CEIP José María de la Fuente - Spain)

Temperatures must be around 0° C degrees or less. There must be humidity and cold air, but not too much.

Intensity:

-Weak snow: falls to 0,5 cm per hour.

-Moderate snow: between 0,5 and 4 cm per hour.

-Strong snow: more than 4 cm per hour (invernal storm).

-Severe snow: more than 7 cm per hour.

It usually snow in high places like in the Pyrenees or in Sierra Nevada.

CHEMISTRY CHRISTMAS TREE

(I.V.Liteanu High School, Sabina Tanase 10c)

Our teacher of Chemistry showed us how we can combine Science and Christmas. We want to explain our experiment. Firstly, we made a tree of a piece of copper. We put Silver nitrate in a glass and put the tree in this substance.



Next day, we went in laboratory and we saw that our tree of copper was change.



You can see that the solution is blue (Copper II nitrate) and silver. Our Christmas tree is now a silver tree.



Do you want to hire a hard worker? I recommend you the Saccharomices Cerevisiae. It is "the author" of the bubbles in the sparkling wine and of the holes in the panettone, and without him we could not enjoy these Christmas delights.



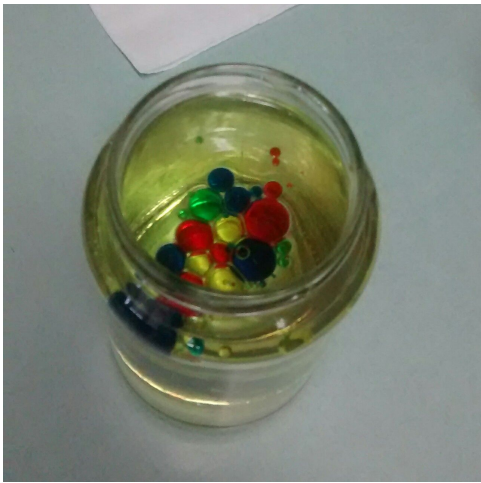
<http://smelllikescience.com/bread-beer-and-the-science-of-yeast/>

Do you want to try? Take flour, warm water, yeast and half a teaspoon of sugar. Knead and magically, after an hour, you will see the mixture increased. The Saccharomices Cerevisiae eat all the sugar, producing alcohol and carbon dioxide, and so there are bubbles and alcohol in the sparkling wine, and holes in the "panettone".

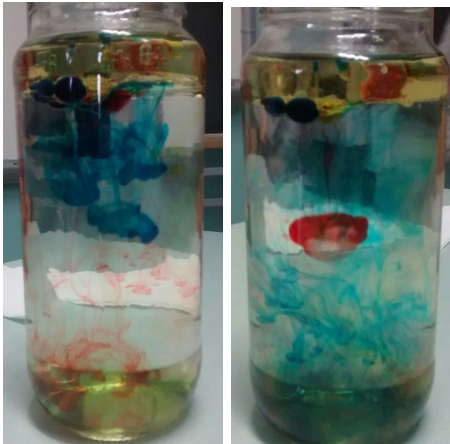


<http://www.scienceofwine.com/wine/sparkling.html>

The metabolism of these microorganisms is called alcoholic fermentation. In the past the bread was homemade, and the



but after a few minutes the drops are released because they are denser than oil and begin to go down expanding themselves and creating some trajectories in the water; thus a spectacular explosion of colours similar to fireworks is formed.

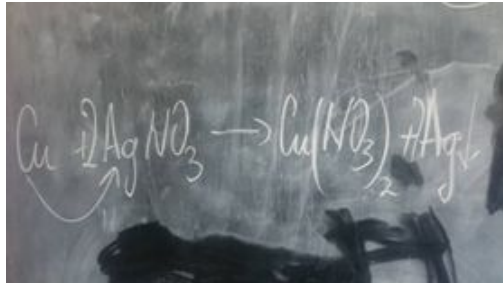


Lava lamp in a glass

(M. Marhavía, K. Papadopoulou – 1st Junior Secondary School of Xanthi - Greece)

This is an easy and fun experiment you can demonstrate even at the Christmas dinner table. You will need a glass, water, oil and food colouring.

Put water in the glass (about ¼ of it). Then add oil until it is almost full. Notice that the two liquids do not mix as they have different densities. Put a few drops of food colouring into the oil. The food colouring falls through the oil and mixes with the water at the bottom. Once the drops reach the water they explode and colour it.



WHY DO PEOPLE EAT MORE DURING CHRISTMAS

(Marcos Morugán- 6th A - CEIP José María de la Fuente - Spain)

I have done a questionnaire to people to know why do people eat more in Christmas. Today there are very common expressions, like “I see my tummy very big, so I am going into a diet”. Well, what would you say if I tell you that 60% of the people that say that, they are not going to keep their promise?. This happens for different reasons, but all have something in common: They break the diet. There can be in this way. You can fall in the temptation of eating a delicious gingerbread. People can say to you that it is delicious and that you will lose the best Christmas food. You can say the common expression “If I eat only one, I won’t hurt nothing”, and you eat one, and then another one, and you enter in a cycle.

Temptation: Think that there are better things than Christmas sweets. Example: your favourite food is omelette, and you are in a diet where you can’t eat Christmas sweets. Don’t eat gingerbread, eat an omelette.

Obligation: If you are in a diet, you promise to yourself that you are going to reduce your quantity of food, so don’t give importance to what the rest of the people say.

Addiction: Don’t start eating christmas sweets if you are in a diet, if you do it, then you can’t stop. If you have the control of eating one and stop, there is no problem, but if not, don’t start.

housewives stored the yeast and feed it adding flour, every day.

MERRY CHRISTMAS

SINGING CHRISTMAS CAROLS

CEIP José María de la Fuente, Ciudad Real (Spain)
We spent the morning last Thursday the 15th December on an excursion to the centre of Ciudad Real, to the Square of El Prado, to sing Christmas carols and make the official opening of Christmas for our school.

During the last weeks, we have been learning about the human reproduction, and one of the things we learnt is that secondary sexual characteristics, that overcome during puberty, are related to the changes we are experimenting in our body now. For example, we are noticing that our voices are changing towards a more “adult” voice, and we have become conscious when we sing the christmas carols. Did you know that a person’s voice pitch is determined by the resonant frequency of the vocal cords? In men it is about 125 Hz, in women about 210 Hz and in children over 300 Hz!





Now add a fizzing tablet into the oil and water mixture. Watch what happens. When the bubbling stops, add more tablets keeps the reaction going so you can enjoy your funky lava lamp for longer.



When you add the fizzing tablet in the mixture, it sinks to the bottom and then starts to dissolve. As it dissolves, it reacts with the water to make tiny bubbles of carbon dioxide, which is a gas. These bubbles attach themselves to blobs of coloured water and cause them to float to the surface. When the bubbles pop, the carbon dioxide gas escapes and the colour blobs sink back to the bottom of the bottle, and the whole thing starts over until the tablet is used up.

Tip: Instead of food colouring, you can use red wine!!!