Co-funded by the
Erasmus+ Programme
of the European Union

The diary of experiments was made by the students from the 6th and 7th year of primary school under the supervision of Ms. Małgorzata Gadzińska and Ms. Irena Nowak.

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EXAMINE, OBSERVE, CONCLUDE!

EXPERIMENTS DIARY

13th June 2018

9. MAGICAL BALLOONS

Things you need:

• two balloons • wide dish • small candle • matches • dish with water.

The course of experiment:

1. Blow the first balloon and tie it on the knot.
2. Pour water into the second balloon and tie it to the knot.
3. Place the heater in the container and set it on fire.
4. Move the inflated balloon over the candle flame.
   What are we observing?
5. Place a balloon with water over the candle flame.
   What are we observing?

Observations:

When we hold on the balloon above the flame of the candle, the balloon with the air breaks up, but the balloon with the water is unchanged.

Conclusion:

Unlike air, water dissipates heat very well. In the experiment, it receives the warmth of the balloon without letting it warm up to high temperatures.

Source: https://www.youtube.com/watch?v=nLCbQfgXRqs

8. CRUSHED BOTTLE

Things you need:

• a dish with hot water • a plastic bottle • a bowl.

The course of the experiment:

1. Put some hot water in the plastic bottle.
2. Spin the bottle and turn it around in all directions.
3. Then pour the water out of it and screw the bottle down.
4. Shake the bottle up and down as soon as you can.
   What are we observing?
5. Then unscrew the bottle and tilt it up over the bowl.
   What are we observing this time?

Observations:

While shaking, the bottle was crushed. After unscrewing it returned to the initial shape. However, after turning the bottle upside down, water spilled out of it.

Conclusion:

After pouring hot water from the bottle there is a lot of water vapor left in it. Shaking causes the bottle to cool and the steam condenses. Lowering the temperature and decreasing the amount of gas causes a reduction in volume. So the bottle is crushed.

Source: A trip to the Imagination Laboratory in Poznań

1. LAKE OF THE NENUFARS

Things you need:

• a plate • paper flowers • dish with water.

The course of experiment:

1. Fold the petals of the flower to the inside. It has to be folded in way that flakes won't block each other.
2. Fill the plate with water.
3. Put the flowers on the surface of the water but don't let the petals be wet!
   What can you see?

Observations:

The flakes of the flowers are skewing.

Conclusion:

Paper is made out of plant fibres. During water absorption, the fibres start to straighten because when they are soaked in water, they have got a bigger volume.

Source: https://ekodziecko.com/rozkwitajaca-lilia-wodna

2. DENSITY TOWER

Things you need:
• liquid honey • dish with water • dye • oil • metal cap • grape • plastic cap • a piece of sponge • cup • table spoon • a high transparent vessel, eg a glass.

The course of experiment:
1. Add a few drops of the dye to the cup water and mix.
2. Pour the comparable amount of honey, oil and water with the dye into a high pot.
3. Wait for a while to let the liquids settle into the layers.
4. Insert liquids carefully: metal cap, grape, plastic cap, sponge.
5. Watch what is happening.

Observations:
In the bowl, the honey dropped to the very bottom, a colored layer of water lay over it and oil above it. Thrown bodies stopped in different layers of fluids. And yes, a metal cap at the bottom, then a grape, a plastic nut, and at most a sponge.

Conclusion:
• Liquids and objects have different densities.
• Among the liquids, honey has the highest density, so it stays at the bottom of the dish. It has less density water, and the smallest oil, that's why it's at the very top.
• The metal nut drops to the bottom, which means it has the highest density. The grape stops in colored water, slightly submerging in honey. The grape has a similar density to water, and slightly smaller than honey. The plastic nut stops between oil and water, so it has density less than water and greater than oil. A piece of sponge floats on top of the oil, therefore its the density is the lowest among the densities of all substances used in the experiment.

Source: https://www.instagram.com/p/BduH19mnlZy

7. LAVA FLASH

Things you need:

• dish with water • oil • colourless container • effervescent tablet • dye • cup.

The course of experiment:

1. Add oil to the ¾ jar.
2. Add ½ cups of water and a few drops of the dye.
3. Add the colored water to the dishes with oil.
4. Throw in the sparkling tablet.

What are we observing?

Observations:

We observe the rise and fall of colorful bubbles.

Conclusion:

The tablet contains carbonates which, in combination with water, produce carbon dioxide. This gas has a lower density than water and oil, so it rises towards the surface, taking with it a portion of the colored liquid. Once they reach the surface, the bubbles burst, releasing the colored water that drops back to the bottom of the bottle.

Source: https://www.youtube.com/watch?v=OKGBRbknBmo

6. DANCING EGG

Things you need:
• egg • salt • spoon • funnel • glass with water • a litre jar half-filled with water.

The course of experiment– stage I:
1. Carefully place the egg in the water. What are we observing?
Observations – stage I:
The egg is drowning.

The course of experiment – stage II:
2. Remove the egg from the water.
3. Put 4 spoons of salt into water and mix. If the salt entirely dissolves, still add more salt until you won't be able to dissolve it.
4. Put the egg into the water. What are we observing?
Observations – stage II:
The egg floats on the surface of the liquid.

The course of experiment – stage III:
5. Carefully use a funnel and add about 1 glass of clean water. Observe the position of the egg.
Observations – stage III:
The egg neither falls to the bottom of the vessel nor floats on the surface of clean water.

Conclusion:
• The egg drowned in clean water because its density was higher than the density of water.
• After pouring salt, the density of water exceeded the density of eggs and therefore it floated on the surface of the liquid.
• When we added clean water, two invisible layers of different densities were created. The egg was located between them.

Source: https://www.youtube.com/watch?v=bGI2X3hsgbg

3. DIVER IN A BOTTLE

Things you need:
• jar with water (quite high) • high plastic bottle with the cap full of water • paper clip • straw (best clear) • a piece of plasticine • scissors.

The course of experiment:
1. Prepare the diver:
• cut straw in the longer part, so that on either side of the fracture it has equal length;
• fold the paper clip so that a heart appears of such bellies, that will be able to enter in holes of the straw;
• put the bellies of the paper clip hearts in the holes of bent half straw;
• form a ball from plasticine and stick it to the paperclip in order not to cover up holes of the straw.
While holding the diver by the straw, put it into a jar filled with water. You should choose the plasticine load of the diver in such a way that only a small upper part stands above the surface;
2. Insert the diver into a water bottle (plasticine down) and screw the bottle tightly.
3. Alternately squeeze and release the walls of the bottle.
4. Observe the diver's movement and the water level in its interior.

Observations:
After squeezing the bottle, the water partially filled the diver and the diver sank. After releasing the bottle, the diver emerged and the water flowed out of it.

Conclusion:
• The diver uses the fact that it is easier to squeeze the gas than the liquid.
• When squeezing the bottle, the air contained in the tube is compressed. It takes less volume, through which additional water gets into the straw. The diver becomes heavier and sinks. When we release the bottle, the air in the tube expands and pushes out the water. This makes the diver lighter and flows out liquid surface.

Source: https://www.youtube.com/watch?v=h_8qQzpIlgA

4. JUMPING RAISINS

Things you need:

• raisins • sparkling water • high dish.

The course of experiment:

1. Put a handful of raisins into the dish.
2. Then, pour sparkling water until ¾ of the height of the dish.
   Watch what is happening.

Observations:

Raisins in carbonated water move once up and down.

Conclusion:

Carbon dioxide is found in carbonated water. This gas is collected on the surface of the raisins in the form of bubbles, until the buoyancy force is large enough to lift the fruit up. When they are on the surface, the bubbles burst and the gas escapes into the air and the raisins fall to the bottom of the dish.

Source: https://www.youtube.com/watch?v=DsaWqJ8EGfQ

5. REVERSING WATER

Things you need:

• glass • jug with water • a sheet of construction paper • bowl.

The course of experiment:

1. Fill the glass to the brim with water.
2. Cover the glass with cardboard.
3. *Run the next stage of the experiment over the bowl.*
   Holding the card with your open hand, turn the glass upside down with a quick movement.
4. Open the hand holding the card.
   What are we observing?

Observations:

The water stays in the glass.

Conclusion:

Atmospheric pressure also works up and it does not allow you to pour water out of the glass.

Source: “Proste eksperymenty dla dzieci”; Wydawnictwo: Dragon;
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