1. Students Activities

1.1. Workplan

In this module stage the children will have the opportunity to examine a phenomenon they will know from everyday life and which they may have asked themself before: „Where do the fizzy bubbles `in` fizzy tablets come from?". The children will have the opportunity to sistematically examine the components of fizzy tablets. The following worksheets can provide a guideline to find answers to that question:

- Nearly 80 years ago, a merchant in Stuttgart mixed some chemical substances, and when he added water to the mixture, it fizzed heavily. He had the idea of creating a wonderfully sparkling drinking powder from this mixture – effervescent powder.

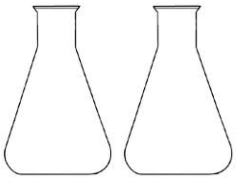
- ***The self-inflating balloon***

Inflating a balloon can be quite hard sometimes. Put a balloon filled with some effervescent powder over an Erlenmeyer flask filled with water.

What can be observed during this experiment?

After the experiment, complete the pictures with the observed details.

Experimental procedure: Fill 50 ml citric acid solution into the Erlenmeyer flask, place 2 teaspoons of effervescent powder into the balloon and then put it over the opening of the Erlenmeyer flask. Afterthat empty fast the content of the balloon into the flask.



before after

Note down your observations and results.

- ***What makes an effervescent beverage fizzy?***
- Effervescent powder or tablets contain different ingrediets. On the packaging you will find the following list: citric acid, sodium bicarbonate (sodium hydrogencarbonate), sugar, colouring, aroma.
- Which of these substances is responsible for the fizzing / effervescence?
- What do you think?

Assumption:
.....
.....
.....

Substances poured into the water	Observation: the mixture fizzes
.....	yes / no
.....	
.....	
.....	

- ***How much gas volume is released by a tablet, fizzy rock or fizzy powder?***

First write down the gas volume amounts you assume will be produced, then carry out the experiments and, finally, fill in your results.

Assumption: fizzy powder.....ml
fizzy rock.....ml
fizzy tablet.....ml

Try to come up with an experiment or an experimental setup that allows you to check your assumptions as accurately as possible. If you have drawn some possible setups, your suggested setup may look like something like the one below.

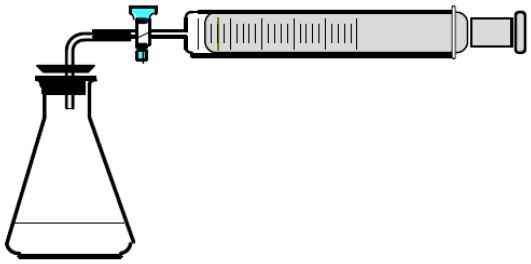


Fig. 2 *Experimental device for measuring the volume of gas released by dissolving a tablet, fizzy rock or fizzy powder*

If you are not sure how a possible experiment could be carried out, we have given you an example here: set up the experiment as recommended above; fill 100 ml of water into the Erlenmeyer flask, add a quantity / a packet of effervescent

powder and quickly close the flask with the stopper coupled with gas measuring tube.

Note down your observations and results.

A packet of fizzy powder produces.....ml of gas

Repeat the experiment with a fizzy rock.
A fizzy rock produces.....ml of gas

Repeat the experiment with a fizzy tablet.
A fizzy tablet produces.....ml of gas

- ***How to build a fizzy rocket?***

You can make a small flying rocket by using effervescent powder or tablets. How could that work and, more importantly, does it work?
Assumption:
.....
.....
.....
.....

If you still have a bit of time and effervescent powder left, think about how you could start make your rocket fly as high as possible. If your teacher doesn't mind, you could start an in-class competion to see whose rocket can fly the highest.

.....
.....
.....
.....

What could be the reason for the different volumes of gas produced by the effervescent powder, rocks and tablets? What would you need to do in order to achieve „fair", i.e. comparable, experimental conditions? See if you can achieve the same results under these conditions as you did before.

Results: .....g fizzy powder produce(s).....ml of gas in.....ml water
.....g fizzy rock(s) produce(s).....ml of gas in.....ml water
.....g fizzy tablet(s) produce(s)....ml of gas in.....ml water

SEVENTH FRAMEWORK PROGRAMME
5.2.2.1 – SiS-2010-2.2.1, Grant Agreement No. 266589
Supporting and coordinating actions on innovative methods in Science education: teacher training on inquiry based teaching methods on a large scale in Europe

How much gas is released by adding two packets of fizzy powder, two fizzy rocks and/or two fizzy tablets in 100 ml of water?

Assumption: 2 packets of fizzy powder produce.....ml of gas in 100 ml of water
2 fizzy rocks produce.....ml of gas in 100 ml of water
2 fizzy tablets produce.....ml of gas in 100 ml of water

Results: 2 packets of fizzy powder produce.....ml of gas in 100 ml of water
2 fizzy rocks produce.....ml of gas in 100 ml of water
2 fizzy tablets produce.....ml of gas in 100 ml of water

Are you surprised by the results?
.....
.....
.....

If your assumption was was not quite right, what could be the reason for this? What can you do to check your assumption? Try it out in an experiment.

If you don't have an idea, here is a clue:

Find out how much gas is produced when you dissove a packet of fizzy powder in 50 ml, then 200 ml and then 500 ml of water.

Do you have an idea how the results from previous experiments can be explained? If not, the following experiment („the fire extinguisher" home-made) may give you the necessary clues.

- ***"The fire extinguisher" home-made***

Which gas is actually produced from the fizzy powder?

Assumption :.....

You can find out the answer to this question with the help of the next experiment. Try to extinguish a candle flame by "pouring" the gas released by the fizzy powder onto it.

SEVENTH FRAMEWORK PROGRAMME
5.2.2.1 – SiS-2010-2.2.1, Grant Agreement No. 266589
Supporting and coordinating actions on innovative methods in Science education:
teacher training on inquiry based teaching methods on a large scale in Europe

Observation :.....
.....

Now find out which gas it could be. Take a look around your school whether you can find clues.

Gas is :.....

- ***My own effervescent beverage recipe***

I will need :
.....
.....
.....
.....

Having those ingredients this is how i will make my fizzy drink:
.....
.....
.....
.....
.....
.....
.....