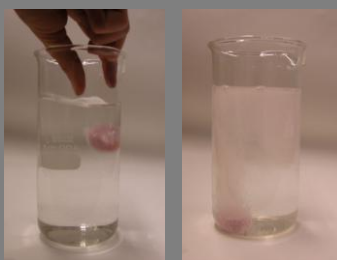




PROFILES IBSE Teaching/Learning Materials for Students

compiled by the PROFILES Working Group of the Freie Universität Berlin – Germany



KieWi & Co. – Substances in Everyday Life – “Where do the fizzy bubbles ‘in’ fizzy tablets come from?”

A Module for Science Instruction – especially Chemistry – for Grades 5 to 7

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Outline

In this course sequence, you will have the opportunity to examine a phenomenon you will know from everyday life and which you may have asked yourself about before – “Where do the fizzy bubbles ‘in’ fizzy tablets come from?” You will have the opportunity to systematically examine the components of fizzy tablets. The following worksheets will help you to find answers to that question.

Acknowledgement:

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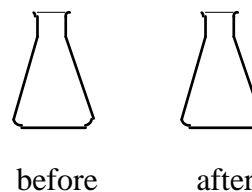
KieWi&Co.: Substances in Everyday Life – “Where do the fizzy bubbles ‘in’ fizzy tablets come from?”

These worksheets belong to:

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.

1. The self-inflating balloon

Inflating a balloon can be quite hard sometimes.
Put a balloon filled with some effervescent powder
over a flask filled with water.
What can you observe during this experiment?
After the experiment, complete the pictures!



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. Now empty the contents of the balloon into the flask!

Note down your observations and results.

2. What makes a fizzy drink fizzy?

Effervescent powder or tablets contain different ingredients. 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?

What do you think?

Assumption:

.....

We add the following substances to water...	Observation: mixture fizzes
.....	yes / no
.....	
.....	
.....	



3. How much gas does fizzy powder, a fizzy rock and/or a fizzy tablet produce?

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

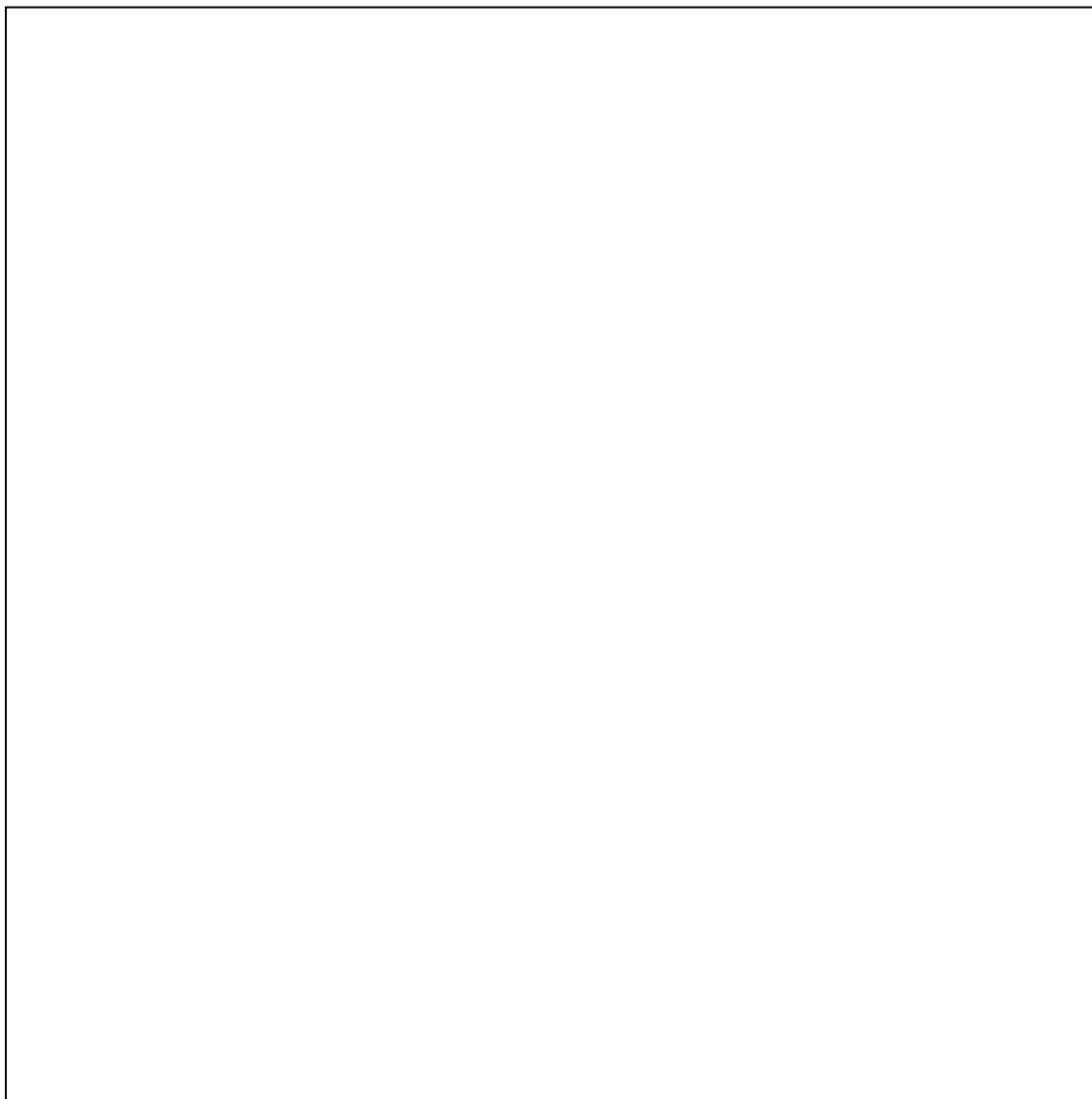
Assumption: Fizzy powder ml

Fizzy rock ml

Fizzy tablet ml

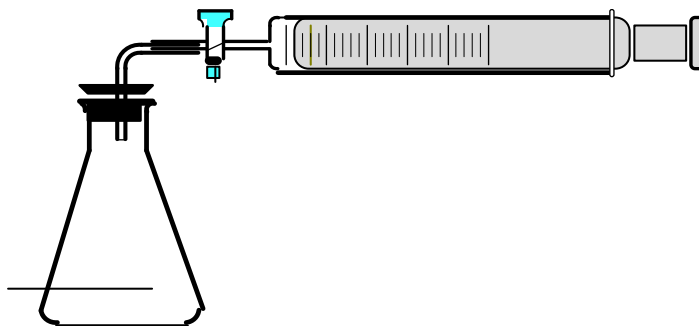
Try to come up with an experiment or an experimental setup that allows you to check your assumptions as accurately as possible.

You can use the following space to note down or draw your ideas.



If you are not sure what a possible experimental setup could look like, we have drawn one possibility below.

If you have drawn some possible setups on the previous page, your suggested setup may look something like the one below.



3.1 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 100ml of water into the flask. Now add a packet of effervescent powder and quickly close the flask with the stopper!

Note down your observations and results.

3.2 Repeat the experiment with a fizzy rock.

3.3 Repeat the experiment with a fizzy tablet.

Don't forget to write down your results of the experiments; e.g. in the table below:

3.1 A packet of fizzy powder produces ml of gas.

3.2 A fizzy rock produces ml of gas.

3.3 A fizzy tablet produces ml of gas.

4. How to build a fizzy rocket

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

Assumption:

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

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4.1 What could be the reason for the different amounts 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.

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

4.2 How much gas do two packets of fizzy powder, two fizzy rocks and/or two fizzy tablets produce 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.

Solution: 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?

.....

4.3 If your assumption 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 have no idea, here is a tip:

Find out how much gas is produced when you dissolve 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 the previous experiments can be explained? If not – the following experiment may give you the necessary clues.



5. The home-made fire extinguisher

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 from the fizzy powder onto it.

Observation:

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

The gas is:

6. My own fizzy drink recipe

Here is room for your own fizzy drink recipe.

I will need:

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And this is how I will make my fizzy drink from those ingredients:

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