

# **Community in the Classroom Presentation Plan**

**Lesson Name** Does air really exist?

**Presenter(s)** Heike Held

**Grade Level** 1 **Standards Connection(s)** Physical Science: States of matter: Gases

## **Abstract:**

*Your opportunity to tell teachers and kids what's going to be fun and interesting about your visit!*

We will learn that air and other gases really exist, although we cannot directly see or feel them. Like scientists, we will infer some properties through experiments. We will learn that gases are matter. They take up space and have a specific weight. They do not have a shape and fill any given space. We even will produce a gas in a chemical reaction! We will compare this gas to air and find that it is heavier than air.

## **Vocabulary/Definitions:**

*3 – 6 important (new) words*

Matter

States of matter

Solid, liquid, gas

Experiment

Chemistry

## **Materials:**

*What you'll bring with you*

Solid objects, various liquids (water, milk, juice), cylindrical and square containers to pour liquids from/into

Plastic bags

Balloons, clips to close balloons

2 Clear plastic cups, large clear container, tissue

Baking soda, vinegar, 16 oz. tubs, sand, measuring spoons for baking soda, small cups for vinegar

Authentic chemistry lab equipment for baking soda/vinegar experiment for demo by presenter, safety glasses

Helium inflated balloon

Paper towels

*What students should have ready (pencils, paper, scissors)*

No materials required

## **Classroom Set-up:**

*Student grouping, Power/Water, A/V, Light/Dark, set-up/clean-up time needed*

Groups of 4 students, seated at tables



# Classroom Visit

## 1. Personal Introduction: \_\_\_\_\_ 5 \_\_\_\_\_ Minutes

*Who are you? What do you want to share with students and why? How will you connect this with students' interests?*

My name is Heike. My Dad was a teacher, and when I was a little girl, I knew that I wanted to become a teacher, too. But when in 7<sup>th</sup> grade chemistry was introduced, I was so fascinated with all the amazing discoveries chemists have made that I decided I wanted to become a chemist myself. I wanted to do research and find out things nobody knew about before. And so I went to University and became a chemist!

## Topic Introduction: \_\_\_\_\_ 15 \_\_\_\_\_ Minutes

*Big Idea(s), vocabulary, assessing prior knowledge. What questions will you ask to learn from students?*

Some of you might be wondering what chemistry is, actually, and what it is that chemists do. I would say, most importantly, chemists want to find out what things are like. Chemists explore materials, and even make new materials out of materials they have! For example, chemists found out how to make the plastic that your cup is made out of, or the bumper on your parents' car. Other chemists work on making medications. We will produce a material today ourselves! When chemists talk about the materials they are dealing with, they call them "matter". Let's look at some examples of matter.

**A1:** Hand out 1 solid object and 1 liquid sample to each group.

Let's look at the items you got. What's this? A toy car? And this? Water? Who knows which one is a solid, and which one is a liquid? Work out the characteristics of solids and liquids (defined shape/takes on shape of surroundings. Demonstrate how liquids can be poured from cylindrical container into square one). Have students show their solid objects, then their liquids. We call this STATES OF MATTER: SOLID and LIQUID.

*Addition: SOLIDS & LIQUIDS. Invite students to point to examples of matter that exist in the classroom. Most will be solid, of course, but some classrooms will have fish tanks and sinks where liquid is located.*

Does anybody know what's around us? Air.

Have you ever thought about what air is? A (mixture of) gas. Gases are the third STATE OF MATTER!

How is air different from this block, or the water in this cup?

Can we see it? No.

Can we touch it? No.

Well, then does it even exist? Is it matter, or is it nothing?

*Addition: GAS. During cool weather, some classrooms may also employ heaters that blow warm air into the room. Alternately, some classrooms might have radiators or space heaters that could be referenced for the discussion of gas in the room.*

Chemists and other scientists are very curious people. They come up with ways to learn about things they sometimes cannot even see. Such activities that help us to learn about things are called experiments.

## 2. Learning Experience(s): \_\_\_\_\_ 25 \_\_\_\_\_ Minutes

*Demonstrations, hands-on activities, images, games, discussion, writing, measuring... What will you do, what will kids do? Describe in order, including instructions to kids.*

Air occupies space. **A2 (demonstrated):** Put cup with tissue up-side-down straight into bucket with water. Tissue stays dry. Something must be occupying the space in the cup.

*Wonderful.*

**A3 (demonstrated):** Pouring air from cup to cup. Now we can actually see air as bubbles!

Feeling air: **A4 (students):** Wave your hand in front of your face. We feel something, so something = matter must be there. Wind moving leaves and branches. Air can be very strong!

*A small fan may be helpful in demonstrating this point, as well. (There are battery powered personal fans that do not require access to an electrical outlet.) Alternately, an old-fashioned hand fan may be of interest, too. One could demonstrate how some people like to fan their bodies in order to "cool off."*



**A5 (students):** Let air out of balloon, feel the draft.

Air occupies any space. Looking at the empty balloon: Where did the air go? Unlike the water I am pouring onto a tray or into a cup. Forms a puddle or adapts to the shape of the cup.

Great!

Making a gas: Carbon dioxide. **A6 (students, in groups):** Build sand “volcano” in plastic tub. Add baking soda, then dyed vinegar. Observe and describe!

Very fun. Here, it could be helpful to pre-determine a specific job for each group member.

Each child in the group could receive a letter card: A; B; C; or D. (The cards could be attached to yarn so that each child can wear his or her letter.) Plan for five sets of cards as most classes will have 20 students.

Prepare a Job Chart.

Sequence the order of events for preparing the volcano.

Step #1. Scientist **A** will: \_\_\_\_\_

Step #2. Scientist **B** will: \_\_\_\_\_

Step #3. Scientist **C** will: \_\_\_\_\_

Step #4. Scientist **D** will: \_\_\_\_\_

**A7 (demonstrated):** Carbon dioxide generation from baking soda and vinegar in larger scale using real lab equipment. Let produced CO<sub>2</sub> bubble through dyed water to visualize the produced gas. Catch the CO<sub>2</sub> in a balloon!

The kids will love this.

Gases have specific weights: **A8 (students):** Compare the weight of the CO<sub>2</sub> filled balloon to air and Helium filled balloons.

Perfect addition.

### **3. Wrap-up: Sharing Experiences and Building Connections** \_\_\_\_\_ **5** Minutes

*Putting the pieces together – how will students share learning, interpret experience, build vocabulary?*

Summary:

We have learned about the 3 states of matter : Solid, liquid, and gas. We have found out how solids, liquids and gases are different from each other. As an example for a gas, we have studied air. We have done experiments to show that air occupies space and can be felt. We have concluded that air is matter. We also have learned that air takes up any given space. In a chemical reaction, we have generated a gas from a solid (baking soda) and a liquid (vinegar)!

### **4. Close:**

\_\_\_\_\_ **5** Minutes

*How can kids learn more? Thanks and good-bye! Clean-up.*

Thanks and good-bye!

Clean up.

**TOTAL** \_\_\_\_\_ **50 – 60** Minutes

## **Follow-up – After Presentation**

Suggest students write a letter explaining “How we learned about \_\_\_\_\_ air and other gases \_\_\_\_\_?”

List or attach examples of activities, websites, connections for additional learning.

Attach worksheets, hand-outs, visuals used in classroom presentation.

