

CAN A BALLOON INFLATE WITHOUT BLOWING?

Purpose of the Experiment:

To create a chemical reaction and explore the release of carbon dioxide gas by observing the inflation of a balloon. To discover that the gas fills the entire container.

Interdisciplinary Theme:

How the World Works



**CURIOUS
BOX** 



INQUIRY CYCLE

TUNING IN

Let's Spark
Curiosity



FINDING OUT

Let's Start
Exploring! / Video



SORTING OUT

What Should
Little
Scientists
Discover?



GOING FURTHER

Scientific
Explanation for
the Curious,
What Else Can
We Do?



TAKING ACTION

Question of the day?



MAKING CONCLUSIONS

What Did We
Discover / Activity
Pages / Exit Ticket



Let's Spark Curiosity



Students are asked the following questions:

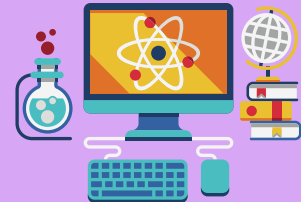
- Do you like balloons?
- How do balloons inflate?

“Little scientists, all living beings breathe in and out. We inhale oxygen gas through our noses and exhale carbon dioxide gas. When we inflate a balloon, we use this gas, which is carbon dioxide. Thanks to the elastic structure of the balloon, it expands as gas fills it. The balloon I have is a bit dirty; can we inflate it without using our mouths? Can you give me examples?” Answers are collected, and students are asked to take out and examine the materials for the experiment. “Do you think we can inflate the balloon with these materials?” is then asked.

Let's Start Exploring!

The activity video is watched by pausing it. The contents of the set are checked, and the experiment is conducted. All steps for opening caps and packages are done simultaneously with the students.

Watch the video by pausing!



Set Contents

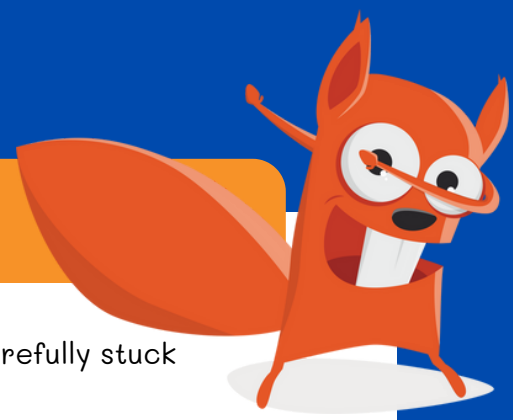
- | | |
|--|--|
| <input type="checkbox"/> Experiment tray..... | <input type="checkbox"/> Baking soda..... |
| <input type="checkbox"/> Child template..... | <input type="checkbox"/> Vinegar..... |
| <input type="checkbox"/> Child label..... | <input type="checkbox"/> Balloon..... |
| <input type="checkbox"/> Mixing container..... | <input type="checkbox"/> Water (not included in the set)..... |
| | <input type="checkbox"/> “Can a Balloon Inflate Without Blowing?” experiment report..... |

Should be implemented under adult guidance!

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How Do We Do It?



1. The child template is taken, and the child label is carefully stuck onto it.
2. "Can you show me the solid, liquid, and gas from your materials?" is asked.
3. The mixing container is placed inside the experiment tray.
4. Water is filled to half of the mixing container.
5. The cap of the bottle containing vinegar is opened, and it is carefully added to the mixing container.
6. The cap of the baking soda container is opened, and the lip of the balloon is opened wide to pour it inside.
7. After transferring all the solid material into the balloon, lip of the balloon is passed through the hole in the child template.
8. The lip of the balloon is carefully attached to the bottle.
9. The balloon is lifted from the bottom, allowing the solid material to pour into the mixing container.
10. The inflation of the balloon is observed.

What Should Little Scientists Discover?

Students are asked the following questions:

- What are liquid materials? Can you name some that resemble water?
- What are gas materials? Can you name some that resemble air?

The two most basic elements required for living beings to survive are water and oxygen. Oxygen is the gas we inhale. Plants and some aquatic organisms produce oxygen. Humans and animals use the oxygen produced and then release carbon dioxide gas into the environment. Smoke from the chimneys of homes and factories, sprays, perfumes, and water vapor are examples of gases.

Gases, like liquids, are mobile and take the shape of their container. For example, when we blow into a balloon, it fills with carbon dioxide gas. The balloon is elastic and expands with the gas filling it. Solids are not fluid and mobile like liquids and gases. Solids, liquids, and gases can transform into each other. For example, when we leave ice in a room, it melts into a liquid, and when we boil this liquid, it turns into gas in the form of water vapor.

Scientific Explanation for the Curious

Students are asked the following questions:

- How did the balloon in the child's mouth inflate during the experiment?
- What caused the balloon to inflate?
- Are there other elastic materials besides the balloon?
- Can we observe gas formation by mixing other substances?
- What smell did you sense during the experiment? How does a smell from far away reach us?

How did the balloon inflate?

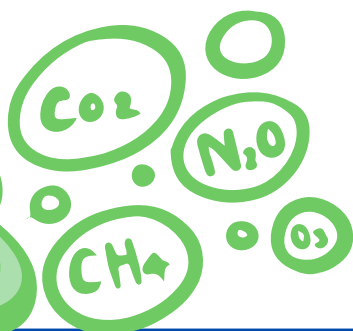
Some substances undergo a chemical reaction when mixed, resulting in the release of other substances. For example, when making a cake, egg, flour, baking soda, and sugar come together to create a new product.

Baking soda is a base used in various cleaning products and in the leavening of dough. Vinegar is an acid used as a flavoring agent in foods, salads, or as a preservative.

When substances like baking soda and vinegar come together, a chemical reaction occurs. This reaction is called an acid-base reaction. As a result of the acid-base reaction, carbon dioxide gas is released. The carbon dioxide gas fills the balloon and causes it to inflate. When we blow into the balloon, it fills with as much gas as it can hold.

How does a smell from far away reach us?

There is a lot of space between gas particles. The particles vibrate, moving in all directions, and can slide over one another. Gases fill the entire environment. For example, when perfume is sprayed in a room, the scent can be detected everywhere in that room.



What Else Can We Do?

Dear Teacher,

With our little scientists, you observed the formation of gas as a result of a chemical reaction and how it fills the entire container. You can also conduct experiments to observe gas formation using other materials.



Yeast Experiment

Materials

Dry yeast, plastic bottle, granulated sugar, warm water, balloon

1. Ask whether the material in the package is alive or not.
2. Open the yeast packet and pour it into a bowl.
3. Add 2 teaspoons of yeast and 1 teaspoon of granulated sugar into the plastic bottle.
4. Pour warm water over the yeast and sugar.
5. Shake the bottle to ensure the yeast and sugar dissolve completely.
6. Place the balloon over the opening of the bottle and put it in a warm place, such as a radiator.
7. Observe the inflation of the balloon at regular intervals.

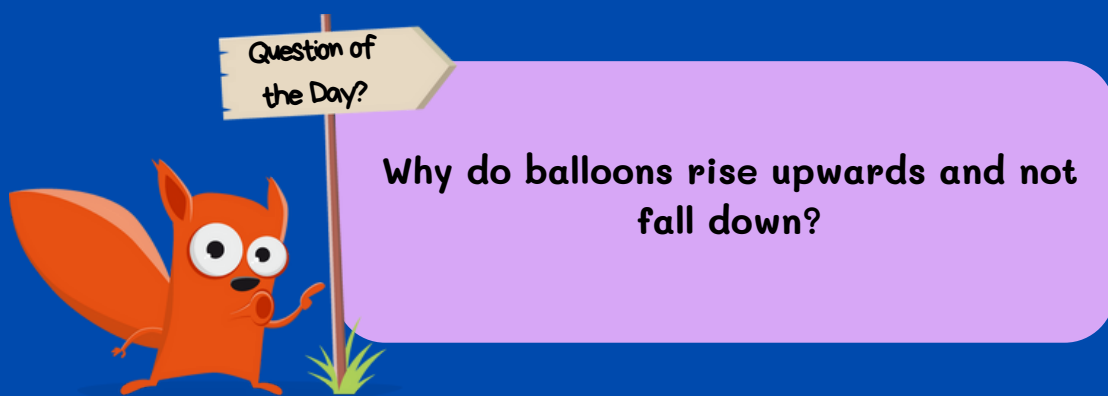
What Happened?

Yeast is a single-celled organism. When it combines with a warm environment and sugar, it buds (reproduces). It feeds on sugar and produces carbon dioxide gas. This gas fills the balloon.

What Did We Discover?/ Exit Ticket

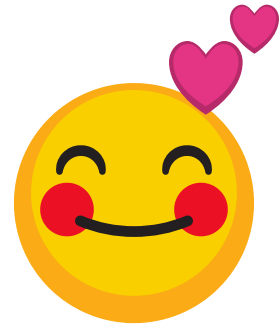
“Today, we conducted a chemical reaction with materials we use in our daily lives. It was fun to see the child making it look like the balloon was inflating, wasn't it? 😊 You can repeat this experiment at home, or you can hang the inflated balloon child in your room.” Then, students will be asked to fill out the “Can a Balloon Inflate Without Blowing?” experiment report on the activity pages. At the end of the activity, students are asked to prepare / create an exit card.

- Did this experiment make you happy?
- Can you share something you learned today?





Mark how you feel with
this experiment!



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