

Brontosaurus Learning

Making science fun!



An Experiment about

Air

The Talking Coin

What you will need:

- A plastic bottle without a lid
- A coin, big enough to cover the mouth of the bottle
- A cup of water
- A freezer

What you will do:

- 1 Put the empty bottle into the freezer for 5 minutes.
- 2 Wet the coin in the cup.
- 3 Take the bottle out and stand it on a table. Lay the wet coin over the mouth of the bottle. **You have to be quick!**

What is going on?

We know that air has molecules. When we put the bottle into the freezer, the air molecules inside the bottle cooled down, and moved closer together. This made room for more air, so air from the freezer moved into the bottle as well.

When we took the bottle out of the freezer, the air molecules warmed up, and started to spread out again. That meant there was no room for the extra air, so it had to go! The molecules of air pushed past the coin to get out.



Challenges:

- How many coins can the air push? If you put too many coins on top of the bottle, is it too heavy for the air to push past? 3? 4?
- What happens if you put a piece of paper over the mouth of the bottle instead of the coin?
- Can you explain why the coin needs to be wet?

TEACHING NOTES:

Brontosaurus Learning Experiment: Air A03

Topic: Air

Key Concepts:

- ♦ Air has molecules. Molecules get closer together when they are cool and further apart when they are warm.

Resources:

- Investigation Record IR01– one copy per student
- Experiment Description Air A03– one copy per student
- Empty plastic container, coin, cup of water, freezer

Lesson Notes:

This may be more of a demonstration than an experiment because of access to a freezer. If it is possible, set up this experiment in small groups nearby a freezer so the students can do it themselves. If not, be sure to include them as much as possible in the demonstration by accepting and trying their suggestions.

Remind students to listen carefully to instructions, and to OBSERVE their experiment.

As a class discuss the experiment prior to undertaking it, and students should complete the sections of their Investigation Report IR01 from "Title" to "Hypothesis".

What should happen in this experiment, and why?

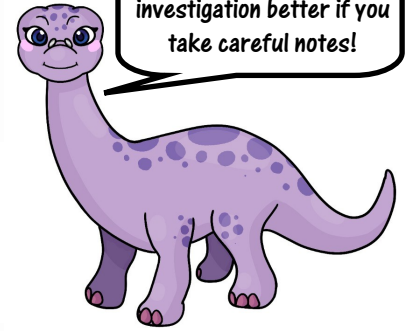
As the cold air in the bottle warms up, it expands and can no longer fit into the container. Air begins to push out of the bottle past the coin, making it bob up and down and seem like it's talking.

The coin needs to be wet to make a seal on the mouth of the bottle.

Follow up discussion questions and activities:

- Could you make a musical instrument using what you now know about air and temperature?
- Can you work together to act out how molecules change as they get colder and warmer?

Investigation Record



Experiment Title:

Scientist (that's you!):

Materials: What will I need?

Investigation—what am I going to do in this experiment?

Diagrams are a great idea!

Hypothesis: What I think will happen:

Observation: What I SAW happen:

Diagrams are a great idea!

From my investigation I learnt:

Great work scientist!