

Brontosaurus Learning

Making science fun!

An Experiment about

Air Upside Down Cups



What you will need:

- A plastic cup
- Water
- A piece of cardboard

What you will do:

1. Check that the cardboard is big enough to cover the whole top of the cup with a bit of extra room right around it.
2. Fill the cup way up to the very top with water. **Make sure there is no room for air in the cup.**
3. Put the cardboard on top of the cup.
4. Put your hand over the cardboard to hold it in place, then flip the cup upside down.
5. Carefully take your hand off the cardboard and watch what happens!

What is going on?

There is air all around the cup pushing against it and the cardboard. There is no air inside the cup pushing to get out, so the air outside the cup can hold the cardboard in place until something stronger than air moves it.

Challenges:

- Slowly tilt the cup in different directions. Does the cardboard move at all? What do you have to do to get the cardboard off? How hard was it to remove?
- Think about how this experiment works and see if you can design another experiment to show the same thing. Can you put something different in the cup for example? Would rice work? What about juice? How about sand? Why or why not? Try it and see if you are right!



TEACHING NOTES:

Brontosaurus Learning Experiment: Air A11

Topic: Air Pressure

Key Concepts:

Air takes up space.

Resources:

- Experiment Description Air A11 – one copy per student
- Investigation Report IR01 - one copy per student
- plastic cups, squares of cardboard, water

Lesson Notes:

As a class read through the procedure of this experiment and discuss how the students are going to conduct the experiment. I always do this experiment outside, just in case.

Before beginning the experiment, students should complete the sections of their Investigation Report IR01 from "Title" to "Hypothesis".

Following the experiment bring your students together to discuss their results and complete their investigation report.

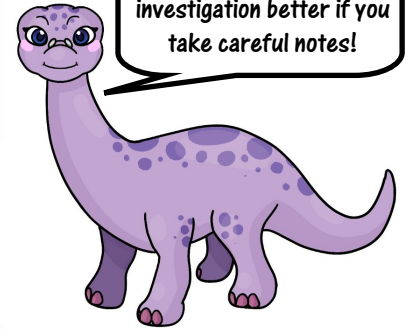
What should happen in this experiment, and why?

Students will be amazed that the cardboard stays in place, but as they tilt the cup eventually the cardboard may slide off. The cardboard is easy to remove once the cup is the right way up and it can be pushed down when the cup is upside down, but it is surprisingly difficult to remove by tilting the cup.

Follow up question:

- What did you do to remove the cardboard in the end? Was it difficult to get off?
- Can you think of a way to do this experiment without having to turn the cup upside down? (you can fill it underwater and place the cardboard on then lift it up already upside down, then slowly remove your hand from the cardboard).

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!