

Activity Description

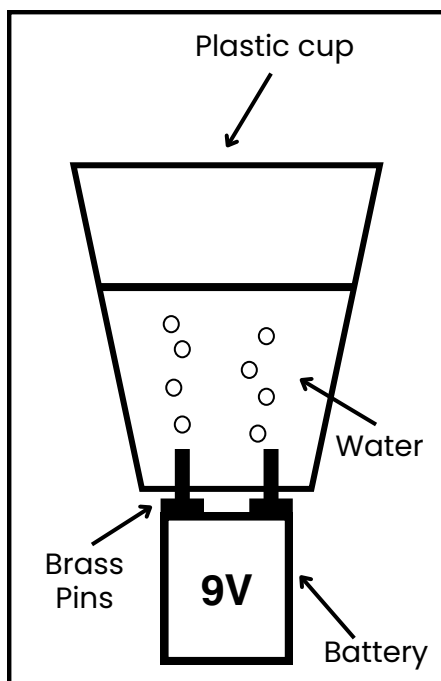
This is an experiment aimed at aged 12 – 15 pupils. Alternatively this experiment could be demonstrated by a teacher for younger students

It consists of:

- A practical to explore electrolysis and specifically how hydrogen is made
- Reflection notes to explain what was seen during the experiment
- Questions to consider about the results of the experiment

Making Hydrogen Using Electrolysis

Water is a chemical compound with the symbol H_2O , which means it contains both hydrogen and oxygen atoms. This practical demonstrates how an electrical current can be passed through water to split H_2O into hydrogen and oxygen in a process known as electrolysis.



What Supplies do you Need?

- Plastic cup
- 9V battery
- Brass drawing pins
- Bicarbonate of soda

How to Split the Water?

1. Mark the position of the electrodes of the 9V battery when it is placed underneath the cup (as per the diagram)
2. Push the brass drawing pins up through the cup at these points so the tips are inside of the cup
3. Fill the cup with water about half to two-thirds of the way and add a small amount of bicarbonate of soda
4. Place the 9V battery underneath the cup so each electrode is beneath a drawing pin

What did we see?

- Air bubbles rose from each electrode!
- This is because water is split into hydrogen and oxygen, its individual elements
- The equation for this is: $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$
- Electricity is used here to split the water, but if the process is reversed (like in a fuel cell), electricity can be produced instead
- Due to the high cost of electricity, electrolysis is not often used to produce hydrogen, but is seen as a good method for the future

Questions to Consider...

- Were the same amounts of gas produced at each brass pin (electrode)? Why would different amounts of gas be produced?
- Can you identify which gas is produced at each electrode, just by looking at the amount of gas? How?