

Try
This

Pouring a gas

Liquids and gases are described as fluids, substances that will flow.

We know liquids can be poured, we do it all the time, but did you know that gases can also be poured? This simple experiment shows this very clearly.

You will need:

- Tea light candle
- Small glass
- Long (kitchen) matches
- A small jug
- Bicarbonate of soda, 1 teaspoonful
- Vinegar, about 50 cm³

What you do

- Place the tea light into the small glass and light it using the long matches.
- Put the teaspoonful of bicarbonate of soda into the jug and slowly add some vinegar until it bubbles and fizzes. Don't put in so much that it comes out over the top.
- Cover the top of the jug as best as you can with your hands to trap some of the gas being produced. After a few seconds remove your hands and pour the gas only – not the liquid – onto the candle.
- The candle is extinguished.

What is going on?

Bicarbonate of soda is sodium bicarbonate or sodium hydrogencarbonate, NaHCO₃.

Vinegar contains ethanoic acid: CH₃CO₂H.

The hydrogencarbonate and vinegar react together to produce carbon dioxide gas:



Carbon dioxide is heavier (denser) than air. It builds up in the jug and can then be poured over the candle. It sinks to the bottom of the glass, pushing out the lighter oxygen and extinguishing the candle. The fire triangle has been broken.

Vicky Wong is Chemistry editor of Catalyst.

| gas | density at STP in kg/m ³ |
|----------------|-------------------------------------|
| nitrogen | 1.250 |
| air | 1.293 |
| oxygen | 1.429 |
| carbon dioxide | 1.977 |



The fire triangle. Remove any one of the three sides and a fire will go out.

