

SCIENCE SHOW OFFS

CANDLE FIRE EXTINGUISHER

RESOURCES NEEDED

- **A small candle**
About 3 cm tall
- **Barbeque lighter or matches**
Works best with a long lighter.
- **Glass, metal, or porcelain bowl**
This works best with a glass bowl, so that people can see more easily
- **Vinegar and baking soda**
This works best with clear vinegar



EXPERIMENT

SET-UP

- **Clear a table. Make sure there is nothing flammable nearby, and make sure you are not wearing clothing that will easily catch fire, like a puffer jacket, a polar fleece, or loose clothing. Make sure that long hair is tied back as well.**

STEP 1

- **Place the small candle in the centre of the bowl. Make sure the bowl is big enough so that the flame will be below the edge of the bowl.**

STEP 2

- Pour about 1 cm of vinegar into the bowl.

STEP 3

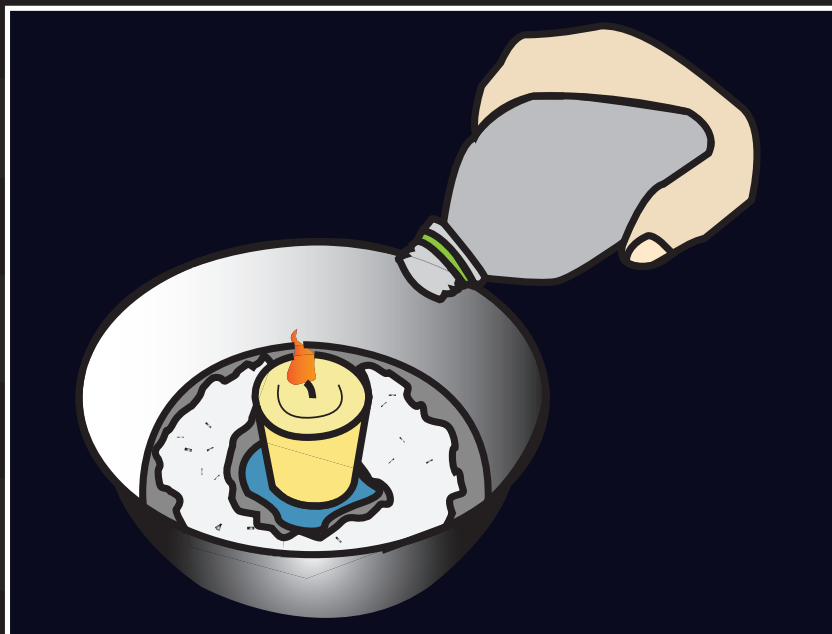
- Light the candle.

STEP 4

- Pour a teaspoon of baking soda on the vinegar.

STEP 5

- Wait for the carbon dioxide to extinguish the candle.



DISPOSAL AND CLEAN UP

- Candles can be reused if they are big enough. Make sure the matches and candles that are thrown into rubbish bins have no embers that could relight in the rubbish, as this could cause a fire! Keep the lighter or matches away from possible sources of ignition such as electrical wires, heaters, or fireplaces. Rinse the bowl with water, and dispose of the vinegar and baking soda that you have used in the sink.

RISK MANAGEMENT

RISK

Fire could burn skin, hair, clothing, or nearby objects.

MANAGING THE RISK

Take care not to put anything over the flame. Tie your hair up and clear the table you are using.

SCIENCE EXPLAINED

When you mix the baking soda and vinegar together, you create a chemical reaction which makes a carbonic acid. This very quickly breaks apart into carbon dioxide (CO₂) gas and water (that is why you see bubbling!).

Carbon dioxide is heavier than air, so it will sink to the bottom and push out all the air. Fire needs oxygen to burn, so if it is surrounded by just carbon dioxide, the candle will not be able to stay alight.

REAL WORLD EXAMPLES

Carbon dioxide is used in fire extinguishers that are recommended for flammable liquid fires or electrical equipment fires and are very effective at smothering flames.

But you may have heard of carbon dioxide before; we breathe it out of our lungs, and it also comes out of vehicles, and factories that burn fossil fuels.

PARENTAL GUIDANCE

Science Show Offs should take place with appropriate adult supervision.

COMPETITION

To enter the Science Show Offs Competition, go to;
otagomuseum.nz/scienceshowoffs