



# Experiment to extinguish fire

## How do you build an invisible fire extinguisher?

Sandra Pia Harmer  
Johanna Hubinger-Kasser  
Theresia Palenta

### You need:

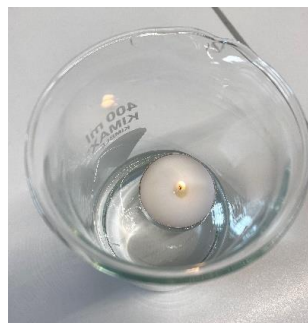
- 1 tea light
- 1 tall glass (e.g. jam jar)
- 1 small glass
- effervescent tablets
- long matches
- water



**IMPORTANT: MAKE SURE YOU HAVE AN ADULT HELP YOU WITH THIS EXPERIMENT!**

### How it works – Part 1:

1. Fill the large glass up to a third with water.
2. Place the tea light on the surface of the water and light it with a long match.





3. Carefully slide an effervescent tablet into the water.
4. Now watch what happens to the flame.



### How it works – Part 2:

1. Light the tea light and carefully place it in the small glass.
2. Fill the large glass up to a third with water again and add an effervescent tablet.  
*NOTE: Now you have to work quickly but carefully!*
3. Carefully hold the glass of water to the candle glass while the effervescent tablet is bubbling.
4. Pretend to pour in the liquid - but stop before it actually trickles in!



### What can you observe?

Write down your observations here!





## What happens?

In both cases, you can observe that the candlelight magically goes out. This always happens just when the effervescent tablets come into play ... but how is that possible? The sparkling water hasn't even touched the flame!

## Why is that the case?

When you put an effervescent tablet in water, it starts to foam and the resulting drink tastes fizzy. You can observe that lots of small gas bubbles form and rise from the effervescent tablet. These gas bubbles consist of the gas **carbon dioxide**, or  $\text{CO}_2$  for short.

Fire needs oxygen to burn.  $\text{CO}_2$  is heavier than oxygen, which is why it collects above the surface of the water and does not escape upwards straight away. As a result,  $\text{CO}_2$  smothers the flames! In the first part, the candle goes out as soon as enough  $\text{CO}_2$  has collected in the glass. In the second part, you empty the  $\text{CO}_2$  that has collected above the water into the small glass, thereby snuffing out the flame. Because even if you can't see the gas, it's there and you can even pour it over!

Have fun experimenting!

*Fotocredits (all of them): Institut für Didaktik der Chemie / Universität Wien*

