Self-Inflating Balloons

Learning about chemical reactions and gas

By Sandra Beale | Toddler and Early Years STEM

What you need

- Small plastic bottle (1 litre)
- Clear vinegar
- Bicarbonate of soda
- Balloon
- Funnel
- Teaspoon
- Food colouring (optional)

Drag the vinegar bottle to pour it into the base bottle!

Try the interactive game online

What to do

1. Give each child a small (1 litre) plastic bottle and help them pour in around 200ml of clear vinegar — invite them to have a sniff first!
2. Add a few drops of food colouring to the vinegar for extra sensory interest (optional).
3. Put a funnel into the neck of a deflated balloon and spoon in 1½ teaspoons of bicarbonate of soda, then carefully remove the funnel.
4. Help children stretch the balloon over the bottle's neck, making sure it's fitted on securely.
5. When everyone is ready, gently lift the balloon so the bicarbonate of soda falls into the vinegar.
6. Ask the children to watch closely and describe what's happening as the balloon inflates itself.
7. Encourage them to share their ideas about what might be causing the balloon to blow up.

Top Tip

Stretch the balloon a few times first so it's easier to fit over the bottle neck — little hands may need a grown-up's help with this bit.

The Science

Vinegar is an acid and bicarbonate of soda is a base. When they meet, they react together and produce carbon dioxide gas. The gas has nowhere to go inside the sealed balloon, so it inflates it — a chemical reaction in action!

What's in it for the children?

Children run their own chemistry experiment and watch an invisible gas do something magical — brilliant for sparking why and how questions.

Taking it further

- Try a colourful foaming version: add bicarbonate of soda, food colouring and a squirt of washing-up liquid to a cup, then pour in vinegar and watch it fizz and foam over!
- Let children compare the two versions — which do they find more exciting, and why?

Key Words

- **Inflate**
- **Deflate**
- **Chemical reaction**
- **Carbon dioxide**
- **Vinegar**
- **Bicarbonate of soda**