BRITISH SCIENCE WEEK 2024

Salters' Institute

SLEEPY SLOW REACTIONS

Hibernation in animals

Some animals hibernate over winter months when finding food is difficult. During hibernation, animals don't eat and become inactive, slowing their heart rates and reducing their body temperature. Chemical reactions in their bodies happen slower, saving energy. In this activity, you'll explore how different temperatures affect the time it takes for vinegar and bicarbonate of soda to react with each other.

1.5 hours

Kit list

- Bicarbonate of soda
- Clear vinegar
- 3 clear jam jars (identical size and shape)
- 1 tablespoon
- 1 teaspoon
- Large bowl
- Access to a hot tap
- Access to a fridge
- Timer
- Pencil
- Paper

Instructions

1. From a bottle of vinegar stored at room temperature, measure 3 tablespoons into a jam jar and leave in the fridge to cool for an hour.
2. Measure 3 more tablespoons of room temperature vinegar into a different jam jar.
3. Measure 1 level teaspoon of bicarbonate of soda into the jam jar containing the room temperature vinegar. Start the timer immediately.
4. A vigorous reaction shown by fizzing bubbles will start in the jam jar. Stop the timer when the fizzing bubbles fall back to the level of the liquid. Record the results in a table.
5. Half-fill the large bowl with hot tap water. Measure 3 more tablespoons of vinegar into a third jam jar and place it in the hot water, leaving it there for 5 minutes. Do not let any water enter the jam jar!
6. Remove the jar from the warm water. Repeat steps 3 and 4 on the warmed vinegar and record the results.
7. Finally, remove your first jam jar from the fridge and repeat steps 3 and 4 with the cooled vinegar. Record the result and think about the difference in the reaction times between the vinegars of different temperatures. Why do you think this happened?

Next steps

The Salters' Institute Experiment of the Month brings chemistry and science to life for everyone. View the whole collection at saltersinstitute.org/resources. From Erupting Lemons to Brilliant Bubbles, there is something for every young chemist and scientist!

Get everyone involved

Younger children Plant 2 containers of cress seeds and leave one in the fridge and another in a warm place. Which germinates first? Do you think the chemical reactions in plants happen faster in warm temperatures too?

Career options

You can work in chemical sciences in a variety of fields, such as:

- agriculture
- food and drink production
- energy
- conservation and environmental monitoring
- forensics
- healthcare
- and even in the cosmetics industry!

Chemists work in diverse locations such as laboratories, hospitals, factories and in various field locations.

Beware that vinegar and bicarbonate of soda are low hazard chemicals.