

An *eggsperiment* on teeth

How is a tooth like an egg? Both contain calcium compounds which can be attacked by acid. When you put an egg in vinegar the shell is weakened by the acid making it soft and more fragile. When teeth are exposed to acids in the mouth they become more vulnerable to cavities. Teeth and eggs can both be protected by the use of fluoride.

You will need

- Small pot or ramekin dish
- Small glass jug or see-through plastic cup wider than an egg
- An un-cracked fresh brown egg
- Small tube of regular fluoride toothpaste (about 75ml)
- Distilled vinegar (colourless)
- Cling film
- Coloured nail varnish
- Paper towels
- Spoon

This experiment will take about 5-6 days.



Step 4 The egg in the toothpaste



Step 7 The egg in the vinegar. The half which was not in toothpaste can be seen to be bubbling



Step 8 After about 3 hours the half of the egg which was in toothpaste remains the same; the other half has changed colour and the shell is clearly damaged

What to do

1. Warm an egg to room temperature. Wash the egg and then dry it with the paper towel.
2. Empty the tube of toothpaste into the pot or dish. Pat the toothpaste down to remove any bubbles and level it out.
3. Put a dot of nail varnish onto one side of the egg.
4. Put the egg into the dish with the marked side down so that half of it is covered in toothpaste. Make sure that the egg does not touch the bottom of the dish.
5. Cover the whole thing with cling film and leave at room temperature for at least 4 days.
6. Rinse all the toothpaste off the egg with warm water and leave to dry overnight.
7. Pour enough vinegar into a clean cup or jug to cover the egg and then carefully lower the egg into the vinegar with the spoon. Rest the spoon on top of the egg to keep it under the vinegar. Cover with cling film. Watch the bubbles form on the unprotected side of the egg.
8. After at least 7 hours the unprotected side of the egg will soften. If it hasn't after 7 hours, keep checking every hour or two by tapping the shell lightly with a pencil or your finger.
9. When the unprotected side is soft, remove the egg and gently wash it. You should be able to see a noticeable difference between the protected and unprotected parts of the egg.

The fluoride in the toothpaste protected the half of the egg which was soaked in it. This is similar to the protection given to teeth by fluoride.



Step 9 After several hours in the vinegar, the eggshell has become softened

Look here!

For more information about how fluoride helps teeth visit the animated-teeth website: <http://tinyurl.com/pv9bmr>

Health and Safety Raw eggs can be a source of salmonella (food poisoning). Wash your hands after handling them.