# Eco-friendly water bottle instructions (pupil)

## Safety note

You will be using some chemicals in this activity which can harm you if eaten. These have a star next to them in the equipment list. To prevent you accidentally transferring these chemicals to your mouth during or after the activity, please wear gloves while handling these chemicals, and wash your hands with soap and water once the activity has been cleared away.

## Equipment

* 1 bowl containing 950ml of water
* \*1 bowl of calcium lactate solution (pre-prepared by teacher)\* See SAFETY NOTE
* 1 small bowl containing sodium alginate solution and food colouring (pre-prepared by teacher)
* Mixing spoon
* Small measuring spoon e.g. tablespoon, or soup spoon
* Disposable gloves
* Timer
* 2 labels and pen

## Method

1. Put on gloves.
2. Collect together your equipment.
3. Label each of your bowls as ‘alginate’, ‘calcium bath’ and ‘water bath’.
4. Using the small measuring spoon, slowly lower a spoonful of the alginate into the calcium bath. Hold the spoon just under the surface of the liquid in the calcium bath for about 30 seconds, then slowly turn the spoon upside down to gently add the alginate to the calcium bath. Repeat this until everyone in your group has had a turn.
5. Use the mixing spoon to very gently stir the calcium bath.
6. Allow the calcium bath to react with the alginate for around 3 minutes.
7. Very gently (with gloves on), scoop the alginate bubbles out of the calcium bath with your hands. Lower these bubbles into the water bath to stop the chemical reaction.
8. Leave the bubbles to rest in the water bath for 1 minute before removing them to investigate.
9. If you have any alginate left, repeat steps 4-8 until you have used your alginate solution.

## What is happening?

The alginate is mixed with water, forming a solution which is then immersed in small quantities into a bath containing calcium lactate. The calcium lactate reacts with the alginate, to form a skin of gel around the bubble of water. This bubble of water can then be carried like a water bottle.