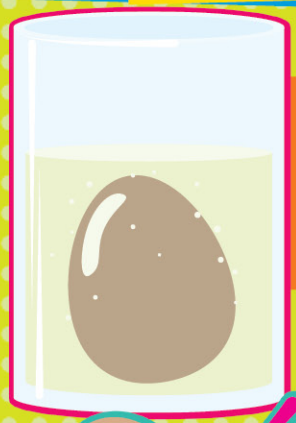
HOW TO MAKE A RUBBER EGG

Follow these instructions and find out how to make a bouncy rubber egg. This activity is a fun way to learn about the chemical reactions that occur when you put an egg in vinegar!

YOU WILL NEED

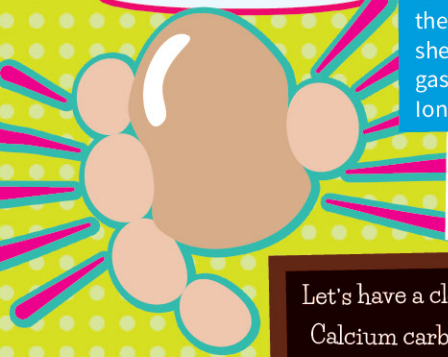
- hard-boiled egg, with shell on
- glass of vinegar

The colour of an egg's shell is not an indicator of its quality, its colour is determined by the breed of hen that laid it.



WHAT TO DO

1. Put the egg into the vinegar - you should see bubbles start to form on the egg.
2. Leave the egg undisturbed for at least a day. You should see some wonderful scum form.
3. Take the egg out of the vinegar and rinse it with water. The shell will rub off.
4. Give the egg a poke with your finger and squeeze it gently.



WHAT'S HAPPENING

Vinegar, or dilute acetic acid, 'eats up' the calcium carbonate in the egg shell, just leaving the inner membrane, or skin, of the egg behind. As the calcium carbonate is responsible for making the shell hard, the vinegar soaked egg feels soft and rubbery. When calcium carbonate (the egg shell) and acetic acid (the vinegar) combine, a chemical reaction takes place and carbon dioxide gas is released. That's why you see the bubbles. The calcium ions (Ca^{2+}) float free in the solution. Ions are atoms or molecules that have an electric charge due to the loss or gain of electrons.

The chemical reaction keeps happening for about a day until all of the calcium carbonate in the egg is used up. Calcium carbonate is in eggshells, seashells, limestone, and many other materials.

Let's have a closer look at the chemical reaction.

Calcium carbonate's formula is $CaCO_3$ and acetic acid is CH_3COOH.

So the reaction is:

$$CaCO_3 + {}_2CH_3COOH \rightarrow Ca(CH_3COO)_2 + H_2O + CO_2$$

THE ACID TEST

If you collect small rock samples and drop them in vinegar, you may see bubbles appear, like they did on the egg. The presence of bubbles indicates that calcium carbonate may be present in the sample. Calcium carbonate reacts with acids to produce carbon dioxide gas, which we observe as bubbles. This is called the 'acid test'. The 'acid test' is one of many tests that geologists use to determine the identity of a rock sample.