Lava Lunacy

Science in the home!

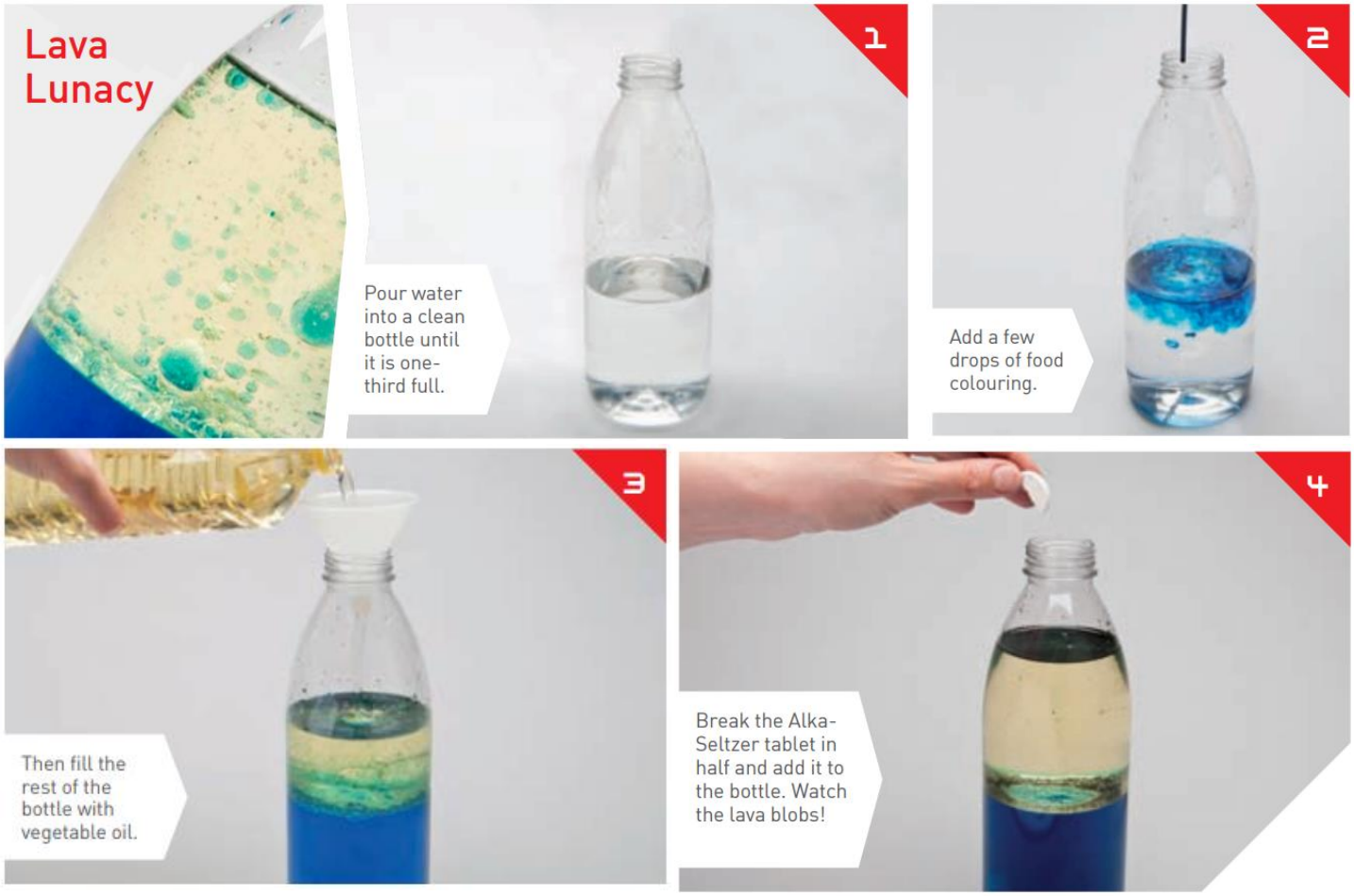
'Kitchen Science' is a collection of activities that people can do at home, with everyday ingredients available from the supermarket or chemist. We want to show that science does not have to be done in a laboratory, by people in white coats. Instead, science is involved in all aspects of people's lives.

Create a vigorous reaction inside a bottle using water and oil!

You will need

- A plastic bottle
- Funnel
- Vegetable oil
- Water
- Food colouring
- Alka- Seltzer tablet

What to do:



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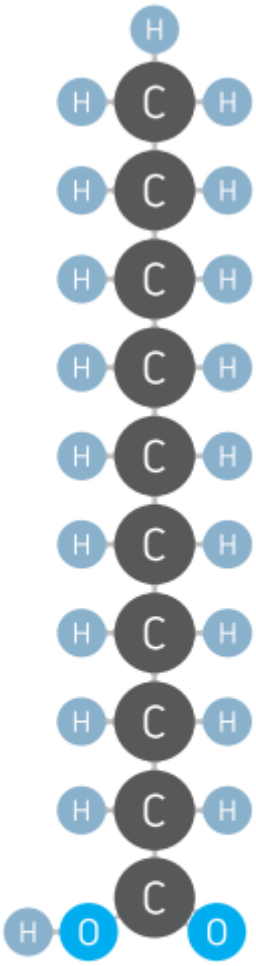
Please note:

- Instead of using Alka-Seltzer, you can put a straw in the bottle and blow bubbles into the water. Do not use yellow food colouring, as it will not show up against the oil!
- If the bottle is knocked over, mopping up may be problematic because of the oil.
- Alka-Seltzer tablets contain aspirin, so children should not be left unsupervised with them.

The science behind the experiment:

Water and oil do not mix, as you probably know!

- This is because water is denser than oil, and sinks to the bottom.
- The food colouring mixes only with the water, which is why the oil stays its normal colour.
- The AlkaSeltzer tablet falls through the oil and when it reacts with the water it creates tiny bubbles of CO_2 .
- This gas floats to the surface because it is much lighter (less dense) than both the water and the oil, carrying drops of coloured water with it.
- When the bubbles pop and the gas is released, the denser water sinks back down again.
- Real lava lamps use heat rather than CO_2 to create the effect, but the principle is the same. At the base is an electric light bulb that heats a flask filled with water. The flask also contains a blob of a waxy material which when cold is slightly denser than the water, so it sits at the bottom. As the wax warms up it expands until eventually it becomes less dense than the water and rises to the top of the flask. At the top, away from the heat of the lamp, the temperature is much lower, so the wax cools and begins to shrink. This makes it denser than the water again, so it sinks to the bottom of the flask and the process starts again. This is called convection.



An oil molecule

A water molecule

Extension: Why not experiment with the different densities of liquids by creating your own 'Density Tower'. Follow the instructions on this YouTube tutorial: https://youtu.be/qKHUNvMsF6U

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