

Microbe Magic Experiments

<http://microbemagic.ucc.ie>

Explore your body – The swap shop in your lungs!

What you will need

A clean glass jar or bottle
200mls water
Food colouring (any colour)

What to do:

- Make sure the jar or bottle is dry and totally clean (you can run them through the dishwasher or wash them well in hot soapy water and rinse very well in cold, clean water).
- Place the jar on a level, solid surface.
- Add the 200mls of water to the jar or bottle.
- Add two drops of food colouring to the water.
- Let it stand, do not touch the jar or bottle.
- What do you see?

What's happening?

When you add the food colouring to the water, it begins to diffuse, that is, it spontaneously spreads out and fills the entire space that the water occupies. You don't have to mix it or shake the water for this to happen, it just does it by itself. The food colouring will continue to diffuse until it has spread itself evenly around the water. The intense colour the drops of food colouring have when you first add them to the water end up a much lighter colour as they are diluted in the water.

Water molecules and the food colouring molecules (like all molecules) are moving all of the time. These movements are so tiny you can't see them even if you squint really hard!

This movement is responsible for the diffusion across membranes when your cells receive oxygen from your blood and carbon dioxide is removed in the alveoli. In biology, this process of diffusion is better known as 'passive transport' because it doesn't require any energy from the cells to occur! In the 'swap shop' in your lungs, oxygen just cost the same amount of carbon dioxide – a good deal as your body doesn't need carbon dioxide anyway!