

Year 7 Science: Home Learning Week 13

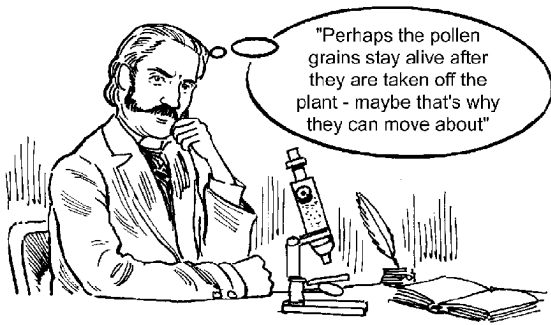
Hello Year 7, there are no BBC Bitesize science lessons this week or next week but I've still put some activities together for you to complete, based on the work of Robert Brown.

I've included instructions for you to make Oobleck, as always, remember to get permission from an adult before doing any practical activities and clean up after yourself when you're finished!

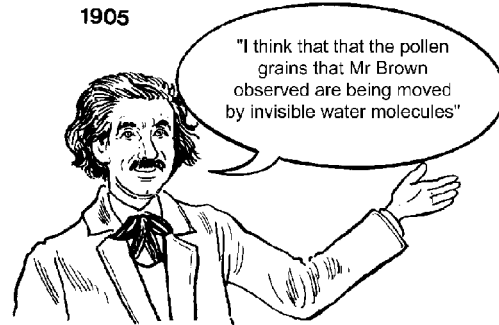
Take care & stay safe

Miss Johnston ☺

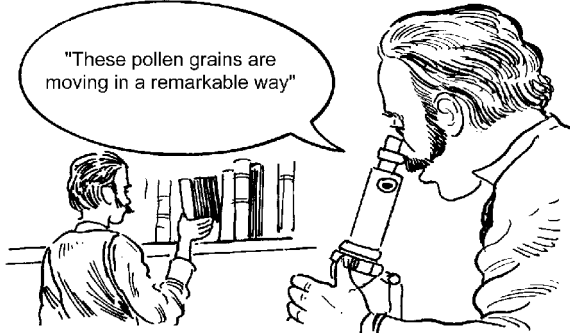
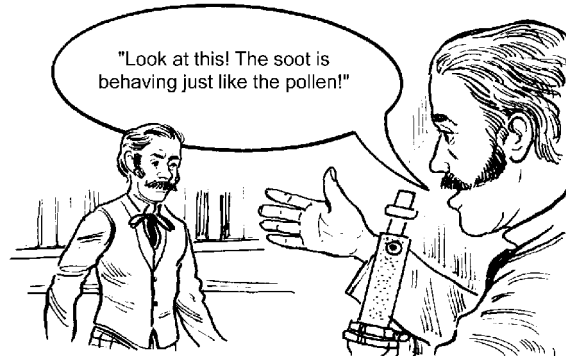
Task	Description
1	Watch this clip about Brownian Motion: https://www.youtube.com/watch?v=4m5JnJBq2AU
2	<p>Read the following biography text:</p> <p>Robert Brown was a Scottish scientist who studied botany – the science of plants. One day in 1827, he was using his microscope to look at some pollen grains that were floating in water. To his surprise, he noticed that the pollen grains were moving in a strange, zigzag way. He checked his observations carefully using other samples and found that they were correct.</p> <p>Brown knew that pollen came from living plants. He thought at first that the pollen itself might be alive, and capable of moving on its own. He tried the experiment again, but instead of pollen he used something that he knew definitely couldn't be alive – soot from a fire. The zigzag motion was still there! This really baffled Brown, who reported his results, but could not explain why the pollen and soot moved in this way. The experiment was then forgotten as no one knew about particles or how they move and so no one could come up with a convincing explanation.</p> <p>Nearly eighty years later, in 1905, Albert Einstein came up with a theory to explain Brown's observations. He suggested that the pollen grains were being bombarded on all sides by individual water particles. The water particles were too small to be seen. The effect of lots of the water particles added together was just enough to push the pollen grains around.</p> <p>In 1908, Jean-Baptiste Perrin used Einstein's theory to calculate the size of a water particles. This estimate suggested that water particles were less than 0.000001 millimetres in size.</p>
3	<p>a) Cut out the pictures on the next page. Put them in the correct order so that they tell the story and stick them in your book.</p> <p>b) Which frame or frames in the story show scientists:</p> <ul style="list-style-type: none">i. making predictionsii. planning experimentsiii. making observationsiv. drawing conclusions and thinking of theories? <p>c) Which scientist first made the observations of the moving pollen grains?</p> <p>d) Who successfully explained the observations?</p> <p>e) How many years were there between the observations and the conclusion?</p> <p>f) What was Robert Brown's first explanation for the movement of the pollen grains?</p> <p>g) Scientists knew that bacteria could be found in water. How could you plan an experiment to show whether or not bacteria were responsible for moving the pollen grains around?</p>
4	OPTIONAL PRACTICAL ACTIVITY: Make oobleck

A**B**

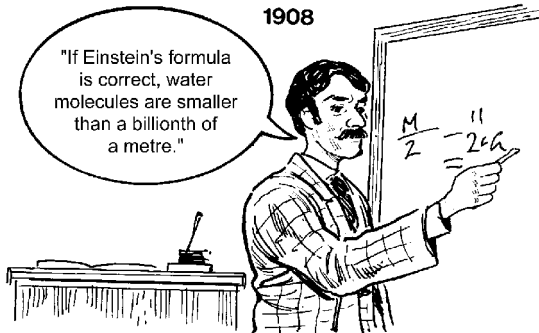
1905

**C**

1827

**D****E**

1908

**F****G****H**

Practical details:

Making Oobleck Slime

Why do this?

Fancy making a weird slimy concoction that acts like a liquid but behaves like a solid when you hit it? Most liquids behave in a predictable manner, but non Newtonian liquids like oobleck slime do not stick to the rules and acts in a very curious way, crossing the boundaries between solids and liquids.

Safety

- This activity is hands-on and rather messy, so make sure you're not wearing your best clothes!
- When you've finished, do not pour the slime down the sink as this could clog the pipes, instead spoon the mixture into a zip-lock bag, fasten it tightly and dispose of it in a bin.
- Don't eat the slime, it won't taste very nice and could be full of bacteria if you've put your hands in it.

Equipment & materials

- | | |
|---------------------|---------------------------------|
| • Large mixing bowl | • Water |
| • Measuring jug | • Spoon |
| • Cornflour | • Clear re-sealable storage bag |

Method

To make the oobleck:

1. Place some cornflour into a large mixing bowl
2. Little by little, add water and use your hands to mix it into the cornflour.
3. Keep mixing until the cornflour and water have blended together and the slime is the consistency of thick honey.

Once you've made your slime, try out a few experiments to see how your slime reacts. Do you think your slime is a liquid or a solid? Why not try the following? Test out:

- Punching the slime and drawing back your hand quickly
- Scooping some of the slime into your hand and rolling it into a ball between your palms
- Leaving your slime out over a few days/overnight and seeing if you can you make it slimy again once it has dried out
- Spooning some of the slime into a re-sealable storage bag until its two-thirds full, and then gently pushing a delicate object (e.g. a biscuit) into the mixture. Then try dropping the bag from a tall height (around 2m) and see how high you can you drop it from before the object breaks

Expected observations and results

You should find that oobleck behaves like a liquid when handled gently, but like a solid if handled forcefully. This is because the cornflour doesn't actually dissolve into the water, so the oobleck is a mixture of water particles and the very small cornflour particles. The mixture binds together tightly under stress.

Background notes

- Make sure you add the water slowly and carefully otherwise the cornflour might clump together or the mixture could be too runny.