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| **Create a lava lamp** | | |
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| **Stay safe** | | |
| Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for:     * ensuring that any equipment used for this activity is in good working condition * behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others     Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol: ⚠ | | |
| **Age range: 3 - 8**  **Approx time:** 10 minutes – 1 hour |  | **Key words / Topics:**   * Science experiment * Density * Changes of state/materials |
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| **Equipment** ⚠ |  |  |
| * A jar * Half a jar of sunflower oil * Water * Red food colouring * Bicarbonate of soda or an effervescent tablet * A torch |  |  |
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| **Instructions** ⚠ |  |  |
| **Step 1**  First of all, pour the sunflower oil into the jar and fill it up to about halfway.  **Step 2**  Now add the drops of food colouring to the oil. Do your best to add the food colouring as drops, rather than a stream of colour.  **Step 3**  Now fill the rest of the jar with water. To add some atmosphere and create the lamp effect, put a torch behind the jar so that the light shines through the liquid.  **Step 4**  Lastly, add a teaspoon of bicarbonate of soda to the jar. This will create bubbles and will get the liquid moving.  Now you can sit back and relax as the lava lamp goes to work! | | |
| **Science** |  |  |
| Water is more dense than oil, so it sinks to the bottom of the jar, and the oil floats on top. As oil and water don’t mix, there’s a separation boundary between the two.  Food colouring is water based, making it denser than oil too, so it also sinks to the bottom of the jar.    You’ll notice that when you add the water, the food colouring dissolves into it and both the food colouring and the water sit at the bottom of the jar with the oil on top.  When you add the bicarbonate of soda, or effervescent tablet, it reacts with the water to produce carbon dioxide gas bubbles. These stick to the water droplets. The water and gas combination together is less dense than oil! So, they rise to the top of the jar.  At the top, the gas bubbles pop and escape into the air but the dense water gets left behind and sinks back down to the bottom again. | | |
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| **The Engineering Context** film |
| Understanding the way different materials work and the properties they all hold is key to creating and developing solutions to our world’s problems. Engineers are interested in the world around them and use these different materials as the basis of every solution they create! |

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| **Curriculum links** | | | |
| **England: National Curriculum**   * **Understanding the World;** Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. | **Northern Ireland Curriculum**   * **Pre-School Education** * give children opportunities to build with construction materials; and ensure that learning is challenged as children explore their own ideas and use open-ended resources. * developmentally appropriate materials | | |
| **Scotland: Curriculum for Excellence**   * **BGE Science; Materials – Early** * Through creative play, I explore different materials and can share my reasoning for selecting materials for different purposes. | **Wales: National Curriculum**   * **Foundation phase;** Knowledge and understanding of the world | | |
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