



Objectives		Extra Information
Lesson 2 – Parent/Child Version.	<p><b>GUIDANCE</b> – This lesson will need to be held with a 90-minute break after the starter. Before the lesson you will need to mix the water and soil (any soil will do as long as it does not pose a risk to your child). Give them a shake before the lesson to ensure when children enter the contents are well mixed.</p>	
<p><b>L.O:</b></p> <p>To Separate A Mixture In Water.</p> <p>To Witness And Understand A Change Of State.</p>	<p><b>STARTING ACTIVITY – Purifying Water. (30 Minutes)</b></p> <p>Ask your child, is tap water just water or is there anything else in it (show them an example of tap water as you do this)? Take their opinion and if they do not pick up on it organically in the discussion explain there are chemicals in tap water that keep it free from bacteria – it is not pure water.</p> <p>Explain that this shows not all mixtures we can see. Explain today they are going to purify water but they are going to use some water that is a bit more obviously contaminated (direct them to their water bottle of water mixed with soil). Discuss when it is necessary to purify water?</p> <p><b>Activity Breakdown:</b></p> <ol style="list-style-type: none"> <li>1 Ask your child to start by getting all their equipment ready. They will need their contaminated water bottle, a beaker, a funnel, cotton wool, charcoal powder and sand.</li> <li>2 Tell your child to plug the funnel with a small amount of cotton wool, explain that this is to stop the filter materials from falling into our purified water.</li> <li>3 Get them to place the funnel in the beaker, they may need to support the funnel throughout this experiment depending on your set up so make sure they have everything they will need to hand.</li> <li>4 Tell your child to pour in even layers of sand, charcoal, sand, charcoal, and finally sand. It may help to display this. As they do this make sure they are doing this correctly and also aren't over filling their funnel as they will need to leave space for water to be poured on top.</li> <li>5 Tell your child to slowly pour their contaminated water into the funnel.</li> </ol>	<p><b>Materials Required:</b></p> <ul style="list-style-type: none"> <li>✓ Freezer</li> <li>✓ A water Bottle per pupil (Ask parents to help collect these the 500ml size works best)</li> <li>✓ Beaker</li> <li>✓ Funnel</li> <li>✓ Water</li> <li>✓ Soil</li> <li>✓ Sand</li> <li>✓ Cotton Wool</li> <li>✓ Charcoal Powder (you can grind up normal charcoal for this)</li> </ul> <p><b>Key Words:</b></p> <p>Filtration Filter States of Matter Solid Liquid Gas Contamination Purify Variable Insoluble Mixture Bacteria Charcoal Powder Variables Uncontrolled Variables</p>



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	<p>Explain the process as the water is slowly filtering through; the sand filters out the insoluble particles while the charcoal is very absorbent and absorbs the organic and mineral materials in the water. Take time to mention that the water is still not safe to drink! Explain that this filter is ineffective against bacteria and that boiling is necessary to further purify this water.</p> <p>Have the child/children use the original water bottle after washing with the now purified water. Explain you will be taking their water bottles to the freezer for 90 minutes and then end the first section of the lesson.</p> <p><b>MAIN TEACHING – Changes of State (Instant Ice). (10 Minutes)</b></p> <p>Tell your child they will be attempting to turn water into ice ‘instantly’ when they remove the water bottle from the freezer and hit it, it will change from water to ice in front of them. It can help if the experiment fails to either try again later or to find an example of this experiment on the internet.</p> <p>It may be a good idea to explain to your child that the following experiment doesn’t always play out as expected (the water could be too cold and freeze early, or not cold enough and stay water). Use this as an opportunity to explain uncontrolled variables in experiments (things that can influence the experiment negatively that we can’t control). Ask your child what possible uncontrolled variables might exist in this experiment. Suggest things like temperature of the room, temperature of the freezer, temperature of the water. If you have time you could also discuss the controllable variables (e.g. bottle size and shape, position in freezer etc..).</p> <p><b>MAIN TASK – (10 minutes)</b></p> <p><b>Activity Breakdown:</b></p> <ol style="list-style-type: none"> <li>1 Quickly and gently remove the bottles from the freezer, it may be best for you to do this as disturbing the bottle too much can start the reaction</li> <li>2 Once your child has their water bottle, tell them to wipe away the condensation to improve visibility and hit or slam the bottle to start the reaction.</li> <li>3 It’s entirely possible nothing happens; in which case they can place their water bottles back in the freezer and try once more at the end of the lesson.</li> <li>4 If successful the water should instantly turn to ice.</li> </ol>	<p><b>Traffic light expected lesson outcomes:</b></p> <ul style="list-style-type: none"> <li>✓ I can set up an experiment to filter water through charcoal.</li> <li>✓ I can perform and explain the charcoal/sand filtration process.</li> <li>✓ I can explain and perform a charcoal/sand filter as well as understand and explain the process of water freezing.</li> </ul>



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	<p><b>Mini-Plenary :</b> Ask your child what they think happened and why, lead them towards the idea of change of state. Ask them if they know why things change state at different temperatures. Refer to the previous lesson and explain that as a material gets colder the particles move less and so it turns into a solid.</p> <p><b>PLENARY – (10 minutes)</b> Ask your child to make a mind map of the other ‘changes of state’ they can think of. Then discuss some examples you can think of to add to their mind map - Ask your child to give their favourite example and explain what it looks like or how it happens.</p> <p>Discuss any suggestions they have made.</p>	



**Reflection**

**Child's Progress**