

## Name of Lesson: Properties and Changes of materials

Key Stage Level: KS2


Subject: Science

Prepared By: Diane Green

Time: 45-60mins

<p><b><u>Overview &amp; Purpose:</u></b></p> <ul style="list-style-type: none"> <li>• To identify common materials and compare and group them based on their properties.</li> <li>• What types of materials are recyclable and how they are used and reused?</li> <li>• Why some materials are more recyclable than others.</li> <li>• The energy it takes to recycle certain materials.</li> <li>• What happens to materials that cannot be recycled?</li> </ul> <p><b>(NOTE: This lesson plan can be tailored to various needs)</b></p>	<p><b><u>Education Standards Addressed:</u></b></p> <p>This lesson covers recyclable and non-recyclable materials, their properties and uses. What effect recycling has on materials and how much energy it takes to produce a recycled item compared to a new item. It covers how the treatment of some materials results into the formation of a new material and if this kind of change is permanent.</p>
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	Teacher Guide	
<p><b>Site Tour</b> <b>10-15 mins</b></p>	<p><b><u>Site Tour</u></b></p> <ul style="list-style-type: none"> <li>• For Health and Safety Reasons, they can only go as far as the Control Room.</li> <li>• Will need to split into groups.</li> </ul> <p><b>(NOTE: This ONLY applies if the group are visiting the facility)</b></p>	<p><b><u>Materials Needed:</u></b></p> <ul style="list-style-type: none"> <li>• Different types of plastic bottles and containers</li> <li>• Glass bottle, recycled glass bottles glass items</li> <li>• Aluminium drink cans and other non-iron metal items</li> <li>• Food cans, iron nails other iron items</li> <li>• Newspaper</li> <li>• Magnets</li> </ul>
<p><b>Discussion</b> <b>5 mins</b></p>	<p><b><u>Recycling</u></b></p> <p>Recycling can save energy as it eliminates the need to make new materials from scratch.</p> <ul style="list-style-type: none"> <li>• Recyclable items can be broken down and made into new items.</li> <li>• (Show video if necessary)</li> <li>• Non-recyclable items cannot, for example, wrapping paper with glitter or metallic looks (can use newspaper instead) – recycling contamination.</li> </ul>	

	<ul style="list-style-type: none"> <li>Another example is plastic cutlery, which cannot be recycled as it cannot be broken down (can use metal cutlery instead).</li> </ul>	<ul style="list-style-type: none"> <li>Sand</li> <li>Plastic chips</li> <li>Wooden objects</li> <li>Fleece fabric</li> <li>Copper pipe</li> <li>1p and 2p coins</li> </ul>
<b>Video</b> 2 mins	<p><b>Videos</b></p> <p><b>Animation:</b> <a href="https://www.ubbgloucestershire.co.uk/education">https://www.ubbgloucestershire.co.uk/education</a></p> <p><b>Facility Film:</b> <a href="https://www.ubbgloucestershire.co.uk/resources">https://www.ubbgloucestershire.co.uk/resources</a></p>	<p><b>Bin Sort Activity:</b></p> <ul style="list-style-type: none"> <li>Pictures of waste items and recycling bin sheet</li> <li>Use the version according to which borough their school is located in.</li> </ul>
<b>Activity</b> 10-15mins	<p><b>Magnet Game</b></p> <ul style="list-style-type: none"> <li>Which metals are ferrous/non-ferrous?</li> <li>Grouping materials, for example, Aluminium is non-ferrous, and Steel is ferrous.</li> </ul> <p><b>(Use of magnets)</b></p>	
<b>Discussion</b> 5-7 mins	<p><b>Metals</b></p> <ul style="list-style-type: none"> <li>Magnetic metals – any metal with iron in is ferrous, for example, steel. Non-ferrous metals include copper and aluminium.</li> <li>Link to reversible and irreversible changes would work well here.</li> <li>Link to quiz: <a href="https://www.educationquizzes.com/ks2/science/changing-materials/">https://www.educationquizzes.com/ks2/science/changing-materials/</a></li> </ul>	
<b>Activity</b> 10-15 mins	<p><b>4 R's challenge</b></p> <ul style="list-style-type: none"> <li>Reduce, Reuse, Recycle, Recovery.</li> </ul>	<p><b>Additional Notes:</b></p>
<b>Activity</b> 10 mins	<p><b>Bin Sort Game</b></p> <p>Split into the same groups to do a 'Bin Sort' using pictures of recyclable materials and then place them on the sheet in the various recycling bins, boxes or bags etc for their local council recycling.</p>	<p><b>Animation:</b></p> <ul style="list-style-type: none"> <li>A film to demonstrate how an Energy-from-Waste plant works, and the journey to show how the non-recyclable waste (rubbish) travels.</li> </ul>
<b>Discussion</b> <b>(following the Bin Sort</b>	<p><b>Where can the remaining items go?</b></p> <ul style="list-style-type: none"> <li>Recycling centre – large appliances, car batteries, electrical items, garden furniture</li> </ul>	<p><b>Facility Film:</b></p> <ul style="list-style-type: none"> <li>A film on how the different areas of the plant work, as explained by the</li> </ul>

<p><b>Game Activity)</b> <b>5 mins</b></p>	<ul style="list-style-type: none"> <li>• Textile bank – clothes and shoes</li> <li>• Soap bottle pumps – cannot be recycled</li> <li>• Batteries – collection points</li> <li>• Black plastic – can be recycled, but not scanned by the machines</li> </ul>	<p>Operations and Maintenance team at Urbaser Environmental Ltd.</p> <p><b>Site Tour:</b></p> <ul style="list-style-type: none"> <li>• Groups must be in a maximum of 10 pupils.</li> </ul> <p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>• To be discussed with teachers.</li> </ul>
<p><b>Activity</b> <b>10 mins</b></p>	<p><b>Quiz</b> Links to other quizzes: <a href="https://www.educationquizzes.com/ks2/science/properties-of-materials/">https://www.educationquizzes.com/ks2/science/properties-of-materials/</a> <a href="https://www.educationquizzes.com/ks2/science/materials-vocabulary/">https://www.educationquizzes.com/ks2/science/materials-vocabulary/</a></p>	
<p><b>Task</b></p>	<p>Health and Safety Poster. Information sheets will be given out. <b>(NOTE: This also ONLY applies if the group are visiting the facility)</b></p>	