

# Powering The Future Lesson 2 | Lesson Outline



## Learning intention:

To carry out an investigation into the quantities of carbon dioxide released from a chemical reaction, and to gain an understanding of carbon capture technology.

<b>Meta Skills</b> Initiative Collaborating Sense making Critical thinking	<b>Resources</b> Introductory Video – <b>Carbon Capture</b> Worksheet 2a – <b>Capturing Carbon</b> Worksheet 2b – <b>Capturing Carbon Extension</b> Answers – <b>Worksheet 2a &amp; 2b</b>	<b>Per group</b> 250ml plastic bottle 2 teaspoons bicarbonate of soda Teaspoon Approximately 120 mL water Lemon juice Tablespoon Tray Balloon Tape measure, or string and ruler				
<b>Hook into the lesson</b>	Play <b>Introductory Video – Carbon Capture</b> . The video introduces the idea that technology can be used to capture carbon dioxide released from industry, and that this carbon dioxide can be stored or used in further industrial processes.					
<b>Activity</b>	Give pupils <b>Worksheet 2a – Capturing Carbon</b> . It's recommended that this is run as a group activity, with group sizes of 2 or 3. Give out resources needed for the investigation, listed above. For each group, allocate a number of tablespoons of lemon juice that they will use for their investigation, ranging from 1 – 10 tablespoons. Pupils will combine bicarbonate of soda with different volumes of lemon juice inside plastic bottles. They will capture the carbon dioxide released with balloons, and measure the circumference of the balloon containing the carbon dioxide. They will be asked to consider the chemical reaction that has occurred, and to repeat the experiment with a different volume of lemon juice for comparison.					
<b>Plenary</b>	Use the following questions as prompts for class discussion, asking pupils to consider their viewpoints on each of the following issues: <b>Q. How do you feel about the continued use of fossil fuels, if carbon capture technology is used to capture carbon dioxide released?</b> <b>Q. The UK Government want to delay building carbon capture technologies until the 2030s because it's currently expensive.</b> <b>Discuss this viewpoint. Do you agree that the UK should be waiting for the technology to be cheaper before it is used on a large scale?</b> <b>Q. The activity we explored today used our science thinking skills, but there are lots of different skills and opportunities for you to work within the energy industry. With everything you've learned so far, do you see a career in the energy industry as a possibility for yourself, and why/why not?</b>					
<b>Extention</b>	Give pupils <b>Worksheet 2b – Capturing Carbon Extension</b> . Ask groups to share the result of their investigation. Populate a table showing the results obtained by each group. Make sure the table is visible throughout the activity. <table border="1" data-bbox="325 1666 1342 1783" style="margin: 10px auto;"> <thead> <tr> <th>Volume of lemon juice (tablespoons)</th> <th>Circumference of balloon (cm)</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table> Pupils will complete a graph showing the class results. The worksheet will ask them to consider the limitations of the experimental design, and how the properties of carbon dioxide need to be considered in carbon capture.		Volume of lemon juice (tablespoons)	Circumference of balloon (cm)		
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