

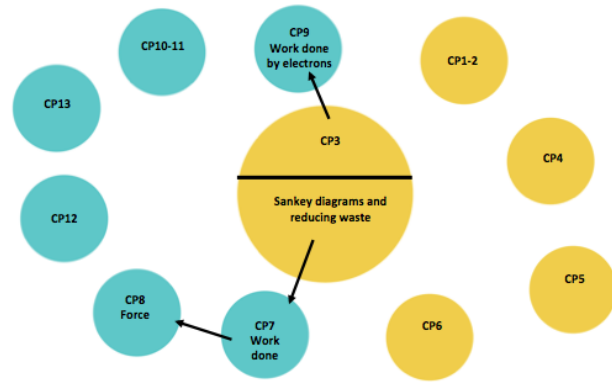
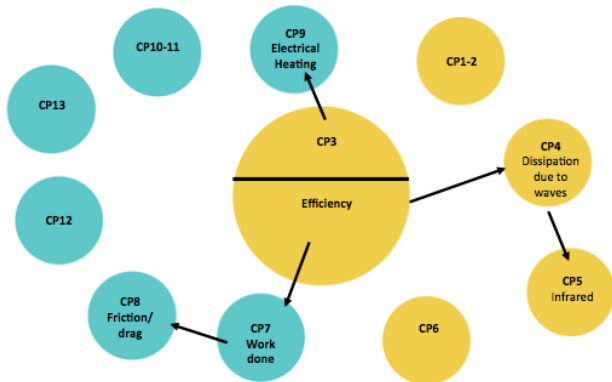
**Students Should:**

3.7	Explain that mechanical processes become wasteful when they cause a rise in temperature so dissipating energy in heating the surroundings	
3.8	Explain, using examples, how in all system changes energy is dissipated so that it is stored in less useful ways	
3.11	Recall and use the equation: $\text{efficiency} = \frac{\text{(useful energy transferred by the device)}}{\text{(total energy supplied to the device)}}$	1a, 1c, 1d 2a 3a, 3b, 3c, 3d
3.12	<b>Explain how efficiency can be increased</b>	

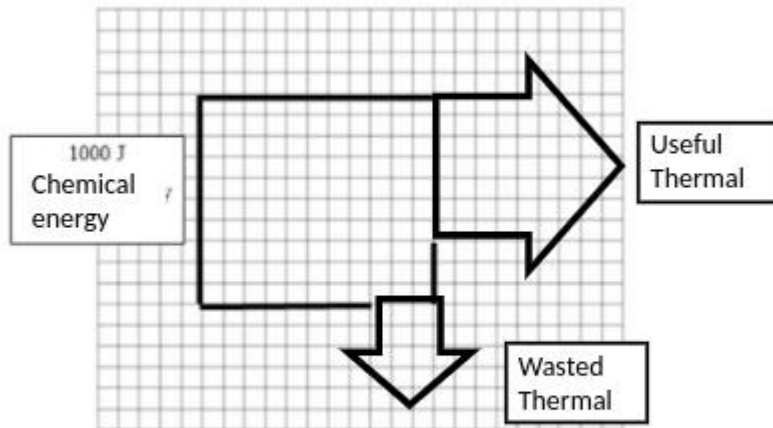
Learning Activities	Communication	Supporting Sites
<p><b>Topic: CP3 Conservation of Energy</b>  <b>What do you want students to know?</b>  <b>See above specification points</b></p> <ol style="list-style-type: none"> <li>1. What efficiency is.</li> <li>2. How to calculate efficiency</li> <li>3. Identify useful and wasted energy and draw</li> </ol> <p><b>Week 2 Learning Objective:</b></p> <ol style="list-style-type: none"> <li>1. State and use the formula for efficiency</li> <li>2. Use the idea of conservation of energy to explain what efficiency means and how it can be increased.</li> <li>3. Suggest useful and wasted energy stores and represent this in a Sankey diagram.</li> <li>4. Explain how wasted energy can be reduced to improved efficiency.</li> </ol> <p><b>Activities:</b></p> <ol style="list-style-type: none"> <li>1. Read and make notes from Combined Science Revision Guide on Efficiency – alternatively review BBC bite size website. Watch the videos and make notes on content.</li> <li>2. Complete energy efficiency worksheet. – Examples to support below.</li> <li>3. Complete at least <b>one</b> other practice worksheets in folder.</li> <li>4. Complete Sankey diagram worksheet</li>   <li>5. CHALLENGE: Draw your own Sankey diagrams of different machines to show used and wasted energy.</li> </ol> <p><b>What do you want them to practice? How?</b></p> <ol style="list-style-type: none"> <li>1. Practice worksheets.</li> <li>2. Complete practice calculations.</li> </ol> <p><b>What can they teach to someone else? How?</b></p> <ol style="list-style-type: none"> <li>1. Have a parent or family member choose different appliances from around your house and work out the input and output energy. Could you also predict how efficient it is?</li> </ol>	<p><b>Key Vocabulary (list 10 words per week)</b>  <b>Efficiency</b>  <b>Input</b>  <b>Output</b>  <b>Wasted</b>  <b>Useful</b>  <b>Energy</b>  <b>System</b></p> <p><b>What would you like them to read?</b>  Combined Science Revision Guide – CP3 Conservation of energy – efficiency. <ul style="list-style-type: none"> <li>• P156-164 in Foundation and P156-163 in Higher.</li> </ul> Download the "23 questions" app - to practice physics equations.</p>	<p><b>Signpost to:</b>  <b>Websites:</b>  BBC Bitesize  <a href="https://www.bbc.co.uk/bitesize/guides/zsb6w6f/revision/1">https://www.bbc.co.uk/bitesize/guides/zsb6w6f/revision/1</a></p> <p><b>Videos:</b>  How to draw Sankey diagrams  <a href="https://www.youtube.com/watch?v=dAOzDsluIX0">https://www.youtube.com/watch?v=dAOzDsluIX0</a></p> <p>Excellent videos and Quizzes for Edexcel Science:  <a href="https://www.kayscience.com/edexcel-biology.html">https://www.kayscience.com/edexcel-biology.html</a></p> <p><b>Share point:</b>  <b>Frog:</b></p>

**Resources needed:** Pen, lined paper.

**This will support:**



1. A kettle uses 1000 J of Chemical energy  
700 J of thermal energy is used to heat the water.  
300 J of thermal energy is wasted and lost to heat the surroundings.  
Complete the Sankey diagram to represent the energy transfer



i) How many joules does each square represent? 100 J

ii) Calculate the efficiency of the kettle. Show your working. 0.7

Another example, 'ball rolling down a hill'...

$$\text{Efficiency} = \frac{\text{useful energy output}}{\text{total energy input}}$$

