



Scheme of Learning	Y7 Science: Energy and Heat Transfers
<ol style="list-style-type: none"> <li>1. End Product</li> <li>2. Subject content</li> <li>3. Skill set: Ability to describe energy and transfer</li> </ol>	<ol style="list-style-type: none"> <li>1. I know that energy is needed to do work.</li> <li>2. I can state that energy can be stored by objects or transferred from one object to another.</li> <li>3. I can describe the energy transfers in some devices.</li> <li>4. I can calculate the efficiency of energy transfer</li> <li>5. I know that fuels release energy when they are burnt.</li> <li>6. I can describe the difference between heat and temperature.</li> <li>7. I can explain the transfer of energy by conduction.</li> <li>8. I know that heat energy will flow more easily through good thermal conductors and less well through poor conductors (insulators).</li> <li>9. I know that most metals are good thermal conductors.</li> <li>10. I know that liquids and gases are poor thermal conductors.</li> <li>11. I can explain the transfer of energy by convection.</li> <li>12. I can use the idea of particles moving apart to make a fluid less dense and to explain simple applications of convection.</li> <li>13. I know that heat can be transferred through empty space by infrared radiation</li> <li>14. I know that radiation does not require the movement of particles. Any hot or warm object gives off or emits radiation.</li> <li>15. I know that infrared radiation travels as waves. It can be reflected and it can also be focused.</li> <li>16. I know that when something takes in heat energy from radiation, it is said to absorb it.</li> </ol>
Key Question	How can physical processes be explained using energy analysis?
Knowledge	<ul style="list-style-type: none"> <li>• energy as a quantitative tool rather than energy being a substance</li> <li>• explanations that explore processes rather than rely on energy</li> <li>• start and end points in energy analyses</li> <li>• quantifiable terms</li> <li>• heating (as a process) rather than 'heat' as a substance</li> <li>• differences as the cause of change</li> </ul>

## NHSG Key Stage 3 Unit Overview for Y7 Science: Energy and Heat Transfers



	<ul style="list-style-type: none"> <li>dissipation and ideas from the second law</li> </ul>
Ongoing Assessment	<ul style="list-style-type: none"> <li>Retrieval questions at the start of every lesson.</li> <li>Worksheets in booklet format for all major concepts to be used for self and peer assessment.</li> <li>Revision checklist at beginning of handout pack and retrieval questions at the end.</li> <li>Misconceptions: avoid suggesting that energy is a substance that can exist on its own, avoid spurious, invented 'forms' of energy</li> </ul>
End Product Assessment	<p>Assessment of graph skills following practical work</p> <p>End of topic test, 30 marks in 35 minutes. Including a mixture of MCQ, short answer and long answer questions.</p>
Clear sequencing of content	<p>Narrative: comparing the starting with the final conditions of a system and describing increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions</p> <p>At Key Stage 4, students will start to carry out calculations. At Key Stage 3, it is useful to introduce a way of talking about energy that can lead to calculations (even if they do not perform those calculations at KS3)</p> <ul style="list-style-type: none"> <li>the terminology of energy stores</li> <li>defining a start and end point in an analysis</li> <li>introduce the idea of heating as a pathway</li> </ul>
Career pathways	Engineering
Diversity and Inclusion	<ul style="list-style-type: none"> <li>Take the opportunity to give examples and images for energy analyses to be diverse and inclusive.</li> </ul>

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Intervention support	Handout packs including learning checklist provided for every student, some students are provided with CGP revision workbooks.
Challenge	<ul style="list-style-type: none"><li>• Stretch challenge question on end of topic test.</li><li>• Stretch and challenge question sheet.</li></ul>