



In the event that individual students are not attending school and are able to complete work, these are the **core topics** being covered by each subject each half term and the relevant links to learning materials to use.

## Subject: Design and Technology

Year: 9

Term	Core topic/s	Learning resources to access	Additional suggested tasks
Autumn 1	<ul style="list-style-type: none"> <li>▪ how technology push/market pull affects choice.</li> <li>▪ changing job roles due to the emergence of new ways of working driven by technological change.</li> <li>▪ product life cycle</li> </ul>	<ul style="list-style-type: none"> <li>▪ <a href="#">Car Workers and Robots Work Hand-in-Hand</a> (1:02)</li> <li>▪ <a href="https://www.youtube.com/watch?v=tpHaN2YrEiM">https://www.youtube.com/watch?v=tpHaN2YrEiM</a> (7:58)</li> <li>▪ <a href="https://www.youtube.com/watch?v=2k_NSy6buxs">https://www.youtube.com/watch?v=2k_NSy6buxs</a> (7:19)</li> <li>▪ <a href="#">Technology is replacing jobs. Are you ready?</a> (5:34)</li> <li>▪ <a href="#">Will Robots Take Our Jobs? - BBC Click</a></li> <li>▪ <a href="https://www.youtube.com/watch?v=ekVereJE1ZI">https://www.youtube.com/watch?v=ekVereJE1ZI</a> (14:38)</li> </ul>	<ol style="list-style-type: none"> <li>1. Explain the difference between technology push and market pull.</li> <li>2. Discuss the potential impact of technological change on employment.</li> <li>3. Using examples, state 3 products that have been made as a result of market pull.</li> <li>4. Outline the 4 stages of a products life cycle.</li> <li>5. Explain what happen at each stage of the product life cycle below. Introduction, Growth, Maturity, Decline.</li> </ol>
Autumn 2	<ul style="list-style-type: none"> <li>▪ positive and negative impacts new products have on the environment</li> <li>▪ continuous improvement</li> <li>▪ efficient working</li> <li>▪ pollution</li> <li>▪ global warming</li> </ul>	<ul style="list-style-type: none"> <li>▪ <a href="https://www.bbc.co.uk/news/business-42455378">https://www.bbc.co.uk/news/business-42455378</a> (1:10)</li> <li>▪ <a href="https://footprint.wwf.org.uk/#/">https://footprint.wwf.org.uk/#/</a></li> <li>▪ <a href="#">Plastic Pollution</a> (6:03)</li> <li>▪ <a href="#">Kaisan The lean experts answer</a> (2:10)</li> <li>▪ <a href="#">Toyota and Kaisan with James May</a> (6:14)</li> <li>▪ <a href="#">Carbon Footprint</a> (1:54)</li> <li>▪ <a href="#">What happens to plastics you throw away?</a> (4:03)</li> <li>▪ <a href="#">Waste to Energy</a> (2:34)</li> <li>▪ <a href="#">Better Apple Environment</a> (1:48)</li> <li>▪ <a href="#">Global Warming</a> (3:01min)</li> <li>▪ <a href="#">Deforestation</a> (2:21)</li> <li>▪ <a href="#">The true cost of Samsung.</a> (8:20)</li> <li>▪ <a href="#">Takeout creates a lot of trash. It doesn't have to.</a> (6:58)</li> </ul>	<ol style="list-style-type: none"> <li>1. Use an online carbon footprint calculator such as <a href="http://footprint.wwf.org.uk">http://footprint.wwf.org.uk</a> to work out your own carbon footprint.</li> <li>2. Study the six stages of the life-cycle assessment and carry out a life-cycle assessment on an electric kettle.</li> <li>3. Explain the meaning of the term 'carbon footprint'</li> <li>4. Many products end up in landfill sites. Explain the impact this has on the environment.</li> <li>5. Explain the impact of deforestation on the environment.</li> <li>6. Discuss how we can reduce our carbon footprint.</li> <li>7. Investigate how you could lower your ecological footprint by making small changes to the way you currently live your life.</li> <li>8. Discuss how your school could lower its ecological footprint.</li> <li>9. Describe what product designers could do to help consumers lessen their ecological impact.</li> </ol>



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Spring 1	<ul style="list-style-type: none"><li>▪ how power is generated from coal, gas and oil</li><li>▪ arguments for and against the selection of fossil fuels</li><li>▪ how nuclear power is generated</li><li>▪ arguments for and against the selection of nuclear power</li></ul>	<ul style="list-style-type: none"><li>▪ <a href="#">What Are Fossil Fuels?   National Geographic</a> (0:55)</li><li>▪ <a href="#">Coal Fired Power Station</a> (2:05)</li><li>▪ <a href="#">fossil fuels - advantages and disadvantages</a> (1:27)</li><li>▪ <a href="#">Nuclear Power</a> (4:46)</li><li>▪ <a href="#">For Nuclear Power</a> (3:47)</li><li>▪ <a href="#">Against Nuclear Power</a> (3:37)</li><li>▪ <a href="#">Nuclear Disaster</a> (2:57)</li></ul>	<ol style="list-style-type: none"><li>1. Fossil fuels are a finite resource. Define the “term finite resource”</li><li>2. Outline the advantages and disadvantages of using fossil fuels.</li><li>3. Outline the impact of fossil fuels on the environment.</li><li>4. Outline the advantages and disadvantages of using nuclear power.</li><li>5. Describe 2 disadvantage of using renewable energy to heat our homes</li><li>6. Name 6 sources of renewable energy.</li><li>7. Outline the advantages and disadvantages of wind energy.</li></ol>
Spring 2	<ul style="list-style-type: none"><li>▪ how smart materials can have one or more properties</li><li>▪ how smart materials can be significantly changed in a controlled manner by external stimuli, such as stress, temperature or moisture</li><li>▪ thermochromic pigments and photochromic pigments</li></ul>	<ul style="list-style-type: none"><li>▪ <a href="#">A guide to Smart and Modern Materials.</a> (2:53)</li><li>▪ <a href="#">Thermochromic Pigment</a> (2:51)</li><li>▪ <a href="#">Thermochromic Examples</a> (1:08)</li><li>▪ <a href="#">Composite &amp; smart materials</a> (6:41)</li><li>▪ <a href="#">Memory Alloys</a> (0:52)</li><li>▪ <a href="#">Photo and Thermochromic Plastics</a> (1:33)</li><li>▪ <a href="#">Shape Memory alloy tests</a> (2:37)</li><li>▪ <a href="#">Polymorph</a> (0:52)</li><li>▪ <a href="#">How smart materials are used in renewable energy solutions</a> (4:47)</li></ul>	<ol style="list-style-type: none"><li>1. Define the term smart material.</li><li>2. Name three stimuli that can change the properties of a smart material.</li><li>3. Name 2 smart materials and explain their use in a product.</li><li>4. Name three applications of thermo-chromic pigment</li><li>5. Using an example of a named product, describe how a smart material enhances the safety of the user.</li><li>6. Describe how the Polymorph pellets can used to make a cutlery handle.</li></ol>



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Summer 1	<ul style="list-style-type: none"> <li>▪ how composite materials are made.</li> <li>▪ the properties of carbon fibre</li> <li>▪ the properties of concrete</li> </ul>	<ul style="list-style-type: none"> <li>▪ <a href="#">Making A Fibreglass Mould</a> (8)</li> <li>▪ <a href="#">BBC - The History and uses of Carbon Fibre</a> (5:37)</li> <li>▪ <a href="#">How reinforced concrete works</a> (2:35)</li> <li>▪ <a href="#">BBC - Why is concrete so brittle</a> (3:19)</li> <li>▪ <a href="https://www.youtube.com/watch?v=WYqCnEvTRUQ">https://www.youtube.com/watch?v=WYqCnEvTRUQ</a>(3:59)</li> <li>▪ <a href="https://www.youtube.com/watch?v=8tEf_X9Rzts">https://www.youtube.com/watch?v=8tEf_X9Rzts</a> (2:07)</li> </ul>	<ol style="list-style-type: none"> <li>1. Define the term composite material.</li> <li>2. Using an example of a named product, explain how a composite material functions.</li> <li>3. State 3 properties of carbon fibre.</li> </ol>
Summer 2	<ul style="list-style-type: none"> <li>▪ Interactive textiles</li> <li>▪ microfibres</li> <li>▪ how phase changing materials (PCMs) work</li> <li>▪ the properties of Rhovyl, Nomex and Geotextiles</li> </ul>	<ul style="list-style-type: none"> <li>▪ <a href="https://www.youtube.com/watch?v=o91f2wmpJRO">https://www.youtube.com/watch?v=o91f2wmpJRO</a> (2:35)</li> <li>▪ <a href="https://www.youtube.com/watch?v=8ZEF581-U48">https://www.youtube.com/watch?v=8ZEF581-U48</a> (1:50)</li> <li>▪ <a href="#">The Story of Microfibers</a></li> <li>▪ <a href="https://www.youtube.com/watch?v=H09nOXbxuy8&amp;list=PLfxYYImUFE_GWGX3pG7qPi8MAdMHdQi5ed&amp;index=3">https://www.youtube.com/watch?v=H09nOXbxuy8&amp;list=PLfxYYImUFE_GWGX3pG7qPi8MAdMHdQi5ed&amp;index=3</a> (4:00) PCM1</li> <li>▪ <a href="https://www.youtube.com/watch?v=OnJs9EmHlzl">https://www.youtube.com/watch?v=OnJs9EmHlzl</a> (4:55) PCM 2</li> <li>▪ <a href="https://www.youtube.com/watch?v=Jyg4piwBqek">https://www.youtube.com/watch?v=Jyg4piwBqek</a> (2:15)</li> <li>▪ <a href="https://www.youtube.com/watch?v=mAdD0LkEnoQ">https://www.youtube.com/watch?v=mAdD0LkEnoQ</a> (3:10)</li> </ul>	<ol style="list-style-type: none"> <li>1. Explain the limitations of interactive textiles.</li> <li>2. Explain how we reduce microfibres from polluting the environment.</li> <li>3. Discuss how PCM can be used in a home setting.</li> <li>4. Outline the properties of Nomex.</li> </ol> <p>Outline 6 functions of Geotextiles.</p>