

**Seeds 4 Schools**  
**KS3 SoW – Why Trees are Important**

**Overview:** This cross-curricular and creative Module provides students with an immersive learning experience, from understanding the principles and processes of photosynthesis, to planning for sustainable forest management. The aim is to help students make linkages between the biology and ecology of trees and forests and issues surrounding climate change and using wood for biomass fuel. They will also gain an insight into how increasing our use of wood can still occur in a sustainable way.

**Most children will:** understand how photosynthesis works and why it is important to the carbon cycle, explain how using wood more in our everyday lives is good for the planet and climate change, and that increasing our use of wood can be done in a sustainable way.

**Some children will not have made so much progress and will:** understand the basic processes involved in photosynthesis and that trees store carbon, appreciate that using wood products and wood for energy can help the planet, and that trees removed from a forest need to be replanted.

**Some children will have progressed further and will also:** be able to critically assess any pros and cons of using wood for energy and practicing sustainable forest management.

Learning Objectives	Cross Curricular & Other	Key Resources:
<p>To understand the complex processes of photosynthesis and why it is important.</p> <p>To recap the process of carbon storage within trees and forests.</p> <p>To understand the potential uses of wood to secure our future.</p> <p>To investigate the advantages of using wood biomass for energy.</p> <p>To consider the linkages between using wood biomass for energy and climate change.</p>	<p>Geography            English            Maths            DT            Art            ICT            Science            Horticulture            Citizenship            History</p>	<p><b>Key Resources:</b></p> <p>IWB            Computer and projector            Internet            Craft material            Drawing paper, pens, pencils            'A Convenient Truth' film            Books/Magazines/Newspapers            Poster materials            Sustainable Forest Management questionnaire</p> <p><b>Overall Outcome:</b></p> <p>To demonstrate an enhanced understanding of why trees and forests are important and how they can be used in a sustainable way to help preserve and protect planet Earth.</p>
<p>To investigate the causes and impacts of deforestation, both in the UK and around the world.</p> <p>To consider the solutions to avoiding deforestation, both in the UK and around the world.</p> <p>To investigate what is considered sustainable forest management and how it works.</p> <p>To investigate and understand why we need sustainable forest management.</p>	<p><b>Vocabulary:</b></p> <p>Words related to photosynthesis            Biomass            Words related to climate change            Deforestation            Sustainable management            Reforestation            FSC</p>	<p><b>Assessment:</b></p> <p>Have students been able to understand/explain how photosynthesis occurs and linkages to the carbon cycle? Have students been able to make linkages between using trees for wood products and energy and climate change? Can students demonstrate a clear understanding of sustainable forest management?</p> <p><b>Unit Extension</b></p> <p>Follow on from this unit into the Tree Planting SoW.</p>

Learning Objectives	Key resources	Suggested Activities	Cross-curricular & other	Outcomes	Extension(s)
<b>(1) Carbon Stores</b>					
<p>To understand the complex processes of photosynthesis and why it is important.</p> <p>To recap the process of carbon storage within trees and forests.</p>	<p>IWB Computer and projector Internet</p> <p>Craft material</p> <p>Drawing paper, pens, pencils 'A Convenient Truth' film</p>	<p>Either as a whole class or in teams, ask students to investigate the process of photosynthesis in plants using books and/or the internet. (If as a whole class, use an IWB and the sites below to get them started. Otherwise, allow teams individual access to the internet). <b>Ensure that they know vocabulary related to photosynthesis.</b></p> <p><a href="http://www.growingthenextgeneration.com/teachers-guide-games-explained.html">http://www.growingthenextgeneration.com/teachers-guide-games-explained.html</a> <a href="https://www.ext.vt.edu/resources/4h/virtualforest/modules/photo.html">https://www.ext.vt.edu/resources/4h/virtualforest/modules/photo.html</a></p> <p>Teams must then produce their own interpretative 3D craft model showing how photosynthesis works. Teams must be able to explain their model in their own words.</p> <p><b>See Activity (2) 'How a Tree Captures &amp; Stores Carbon' in the KS3 SoW 'How a Tree Works'.</b></p> <p>Ask students to recap how trees store carbon by drawing a simple sketch of a tree's role in the carbon cycle and ask them to use labels. Reinforce learning by showing 'A Convenient Truth' film clip of how a tree stores carbon <a href="http://vimeo.com/21301921">http://vimeo.com/21301921</a></p>	<p>Science ICT Horticulture Art DT</p>	<p>To understand the concept of carbon storage within trees.</p>	<p>Ask teams to present their photosynthesis models to the class. Class to provide feedback and perhaps an overall vote to select the one which best displays photosynthesis.</p> <p>Higher ability students might be paired with lower ability so that the complex science behind photosynthesis is understood by all.</p>
<b>(2) Wood – the Smart Material</b>					
<p>To understand the potential uses of wood to secure our future.</p>	<p>Internet access Books Magazines Newspapers</p> <p>Poster materials</p>	<p>Pose the question: <i>Why is wood a smart material?</i></p> <p>Split students into groups and ask them to investigate this question, thinking about different possibilities of how wood can be used, e.g. fuel,</p>	<p>ICT Horticulture DT English Science</p>	<p>Students may evaluate the scientific facts and issues this question will raise.</p>	<p>The class may produce a critical /non-critical article reviewing their findings.</p>

		<p>building materials, furniture etc.</p> <p><b>They must find an answer to why using wood as a material is 'smart'.</b></p> <p><b>HINT:</b> Wooden buildings and the future – investigate the theory behind 'designing future buildings to use more wood instead of concrete, plastic and steel may result in a significant drop in greenhouse gas emissions'. <b>Why?</b></p> <p>Once groups have started to understand this hint, ask them to prepare their findings in a poster to show why using wood is 'smart'. Groups may then present their posters to one another and give each other feedback.</p>		<p>Students will show their research results as poster art and explain their findings to fellow pupils.</p>	<p>Design a blue-print of a home that uses wood as building <b>and</b> heating material.</p>
<b>(3) Why Using Wood for Fuel is Good for the Planet</b>					
<p>To investigate the advantages of using wood biomass for energy.</p> <p>To consider the linkages between using wood biomass for energy and climate change.</p>	<p>Internet access Books Magazines Newspapers</p> <p>Paper, pens, pencils</p>	<p>Building on the theme of the last activity, play: <a href="http://www.youtube.com/watch?v=DcoyTXN99R">http://www.youtube.com/watch?v=DcoyTXN99R</a> <b>Q (Note: you may need to download this at home before the lesson).</b></p> <p>In the same groups, ask students to investigate biomass energy. Some helpful websites that might use include: <a href="http://en.wikipedia.org/wiki/Wood_fuel">http://en.wikipedia.org/wiki/Wood_fuel</a> <a href="http://www.youtube.com/watch?v=c-SSOt7md3o">http://www.youtube.com/watch?v=c-SSOt7md3o</a> <a href="http://www.biomasswoodenergy.com/">http://www.biomasswoodenergy.com/</a> <a href="http://www.treehugger.com/files/2007/05/a_new_twist_on_wood.php">http://www.treehugger.com/files/2007/05/a_new_twist_on_wood.php</a></p> <p>Groups may then research the possibility of their school converting to wood biomass energy (e.g. interview Headteacher, caretakers, parents, Local Authority staff etc.) and ensure that they think about the costs involved. Ask the class what is the significance of using wood as a fuel in terms of climate change, and to consider this, as well.</p> <p>Ask them to finally produce a 1 page brief/action</p>	<p>Science Geography Maths Citizenship English ICT</p>	<p>Students will understand the process and benefits of using wood biomass for energy.</p> <p>Students will also be able to relate using wood biomass back to the carbon cycle and make linkages to why its use is important for climate change.</p>	<p>Students may write a petition to ask if their school may be converted to wood biomass energy, following up from the knowledge they gained through their research and brief/action plan.</p> <p><b>Or-</b> Students could produce a news story for their local promoting that their school already uses wood biomass energy and encourage others to consider using wood fuel, too.</p>



		plan to promote and plan for the possibility of using wood fuel at school. <b>(Note: if your school already uses wood biomass energy, ask groups to devise an awareness raising campaign about the benefits of using this type of fuel for fighting against climate change).</b>			
<b>(4) Deforestation and Forest Loss</b>					
<p>To investigate the causes and impacts of deforestation, both in the UK and around the world.</p> <p>To consider the solutions to avoiding deforestation, both in the UK and around the world.</p>	<p>Computer &amp; projector 'A Convenient Truth' film</p> <p>Internet access</p> <p>Paper, pens, pencils</p>	<p>Play 'A Changing Landscape' from the 'A Convenient Truth' film <a href="http://vimeo.com/21301921">http://vimeo.com/21301921</a></p> <p>Conduct a debate/Question-Time style activity 'The economic dilemma for all stakeholders' designed by the Prince's Rainforests Project. Download from: <a href="http://www.tes.co.uk/teaching-resource/The-economic-dilemma-for-all-stakeholders-6311205/">http://www.tes.co.uk/teaching-resource/The-economic-dilemma-for-all-stakeholders-6311205/</a></p> <p>Assign students their roles (they may even want to fully get 'into character' and make costumes, names etc.) and then allow research time ahead of the debate. Play 'Ancient Forest Destruction' <a href="http://www.youtube.com/watch?v=MnqMgNkwxr4">http://www.youtube.com/watch?v=MnqMgNkwxr4</a> <b>(Note: you may need to download this at home before the lesson).</b></p> <p>Run the debate and compile outcomes as a class on the whiteboard. Class may then write up a proposal to put to the British Prime Minister as a petition to conserve trees and woodlands, both in the UK and around the world, as well as to promote tree planting.</p> <p><b>(See also Activity (3) 'The Forest Lifecycle' in the KS3 'How a Tree Works' SoW).</b></p>	<p>Geography English History Science Citizenship ICT</p>	<p>Students will gain an appreciation of why the world's forests are in trouble.</p> <p>Students will also learn to consider other points of view and realise that problems can have many possible impacts and solutions.</p>	<p>Groups may also investigate specific linkages of deforestation on flooding frequency (as this is a problem all over the world).</p> <p>Follow-up by asking groups to produce a collage of the destruction that is caused by floods – are there any locations in their local environment at risk? How can we help to avoid future flooding from deforestation? Are there particular plants or trees that can help?</p>
<b>(5) Sustainable Management</b>					
To investigate what is	Blank paper for planning Pens, pencils	In light of previous learning, ask students, in their groups, how <b>they</b> would manage a forest	Geography English	Students will have a raised awareness to	Ask groups to also consider the



<p>considered sustainable forest management and how it works.</p> <p>To investigate and understand why we need sustainable forest management.</p>	<p>Poster materials</p> <p>Sustainable Forest Management questionnaire</p>	<p>sustainably for using wood as a material and for making energy on large scales.</p> <p>Ask groups to consider things like and plan for on their paper:</p> <ul style="list-style-type: none"> <li>- Mapping their forest (where is it in the landscape/on maps)</li> <li>- Inventory their forest (what species are there, how many of each; are there other resources in the forest, e.g. water?)</li> <li>- Harvesting their forest (what infrastructure, manpower, technology, transport required, where does the timber go, fuels used in harvesting/transporting timber etc.)</li> <li>- Reforestation (how will they plant new trees to replace the ones removed? Where does the seed come from, who re-plants, when does re-planting occur? Will all of the resources originally there still be there when the new forest is grown? How will their new forest be taken care of, e.g. weeding, pruning, thinning etc.)</li> <li>- Should their forest become FSC accredited? (May want to give them a snapshot of information from <a href="http://www.fsc.org/about-fsc.html">http://www.fsc.org/about-fsc.html</a> )</li> </ul> <p>After they've had time to consider these issues and any others they think of, ask groups to design a poster depicting a forest management cycle. To wrap-up this section, ask each student to fill in the 'Sustainable Forest Management' questionnaire</p>	<p>Science Art Citizenship</p>	<p>the business side of the industry and the understanding of sustainable forest .management</p>	<p>pros and cons of sustainable forest management.</p>
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