

Seeds 4 Schools
KS3 SoW – How a Tree Works

Overview: This creative Module is designed to help students understand the diversity and complexity of things that trees do, both for human beings and also in the wider ecosystem. Students will also explore in more detail the carbon cycle and forest lifecycles, and consider sustainability and deforestation. There is an emphasis on group learning and peer assessment, allowing students to feedback and learn from one another. They also produce several outputs that can be used to communicate their learning and findings more widely, both with other peers at their school, and also to younger audiences.

Most children will: be able to explain how important trees are for a variety of reasons, both to human beings and in wider ecosystems. They will also demonstrate a good understanding of how a tree works and its importance in the carbon cycle by using their model or role play.

Some children will not have made so much progress and will: be able to give a basic explanation of how a tree works e.g. takes in carbon dioxide and gives out oxygen. They will also be able to explain what we use wood for.

Some children will have progressed further and will also: give a sound scientific explanation of how trees work, describe the issues relating deforestation to climate change, and possess a helpful presentation style to audiences of various ages and abilities.

Learning Objectives	Cross Curricular & Other	Key Resources:
<p>To demonstrate an understanding of how a tree works in many different ways.</p> <p>To demonstrate an ability to synthesise facts in a simple and clear way, and share this information with others.</p> <p>To work as a team to produce and deliver a group presentation.</p> <p>To understand the role that trees play in the carbon cycle.</p>	<p>Art D&T English Media Studies Science Geography Citizenship Drama Music Maths RE</p>	<p>Internet connection 'A Convenient Truth' film Art and craft materials Computers Books/newspaper/magazines Peer Assessment sheet Model comments table</p> <p>Overall Outcome:</p> <p>To show an in-depth understanding of how a tree works and the importance of trees.</p>
<p>To understand how a tree reduces the amount of carbon dioxide in the atmosphere.</p> <p>To understand the different stages in the lifecycle of a tree.</p> <p>To appreciate the importance of trees in the wider forest ecosystem.</p> <p>To express a point of view about deforestation.</p> <p>To appreciate the diversity of benefits that trees provide.</p> <p>To explore the importance of trees to humans.</p>	<p>Vocabulary:</p> <p>Wildlife Soil stabilisation Deforestation Sustainable Climate change Ecosystems Carbon cycle Carbon reservoir Gigatonne Biodiversity Habitat Food webs Photosynthesis Decomposition</p>	<p>Assessment:</p> <p>Peer assessment and group feedback (see lesson plans for further details).</p> <p>Unit Extension</p> <p>Explore the use of wood as a sustainable energy material and how can it be better used than fossil fuels?</p> <p>Students may also explore the issues of sustainable management of forests, or look further into issues surrounding deforestation (e.g. Fair Trade, agriculture, fast food etc.)</p>



Learning Objectives	Key resources	Suggested Activities	Cross-curricular & other	Outcomes	Extension(s)
(1) A Living Breathing Tree					
<p>To demonstrate an understanding of how a tree works in many different ways.</p> <p>To demonstrate an ability to synthesise facts in a simple and clear way, and share this information with others.</p> <p>To work as a team to produce and deliver a group presentation.</p>	<p>Laminated tree diagram Laptop Projector A3 paper</p> <p>Laptop Projector 'A Convenient Truth' film Computer suite</p> <p>Peer assessment sheet</p>	<p>Map from Memory of a tree diagram Class is divided into small groups and each group receives an A3 sheet of plain paper. One member from each group will come to the front of the class and look at the diagram on page 4 of all of the things that a tree does http://www.forestry.gov.uk/pdf/eng-trees-and-climate-change.pdf/\$FILE/eng-trees-and-climate-change.pdf</p> <p>After 20 seconds they swap with another group member. This continues until each group member has seen the diagram at least twice. After each time that the entire group has visited the diagram, the group, as a team, has to draw a replica of what they have seen.</p> <p>Then use the 'A Convenient Truth' film clip of the schematic diagram of the tree they've just used in their memory activity to recap. http://vimeo.com/21301921</p> <p>Presentation Production In pairs, create a PowerPoint / Moviemaker presentation aimed at KS1 or KS2 showing and explaining in a simple but interesting way all of the things that a tree does based on the schematic diagram – lower ability groups may focus on 1 or 2 selected things. Overall, the groups may need to do some brief research for their presentation. They must remember to keep it simple (i.e. that their audience is KS1 or 2), use lots of pictures/images and not so many words. They may also want to narrate their presentation (i.e. write a script).</p>	<p>ICT Citizenship Geography Science English</p>	<p>Students will begin to appreciate the vast amount of uses/benefits that a tree provides.</p> <p>They will also begin to recognise that trees are useful and helpful not just to human beings, but for entire ecosystems in general.</p>	<p>Using the peer assessment sheet, each pupil records what level they think each group's presentation is at. (Bear in mind, not all of the criteria will be exactly relevant to this particular activity).</p> <p>Teacher asks pupils why they have given that level to each group and what they would need to do to improve to achieve higher levels.</p>
(2) How a Tree Captures and Stores Carbon					

<p>To understand the role that trees play in the carbon cycle.</p> <p>To understand how a tree reduces the amount of carbon dioxide in the atmosphere.</p>	<p>'A Convenient Truth' film</p> <p>Scissors Glue Card Felt-tips Toilet rolls Cardboard boxes Tissue paper Other craft materials</p> <p>Peer assessment sheet Model comments table</p>	<p>Watch 'A Convenient Truth' film clip of how a tree stores carbon.</p> <p>In the same groups, make a 3D craft model which demonstrates the role of a tree within the carbon cycle. Use a variety of boxes, toilet rolls, straws etc to produce your model.</p> <p>Display the models to the class and each group will write on a post it note what they liked about each model and what needs to be improved</p> <p>Each model and group will receive a variety of comments from its peers. Ask groups to spend some time reflecting on these comments. They can record these comments as a group onto the 'model comments table' provided for their records.</p>	<p>Science Art DT Citizenship Geography Maths</p>	<p>Students will understand the concept of carbon storage within trees.</p> <p>Students will appreciate the vast amount of carbon that trees store.</p> <p>Students will also creatively express an understanding of the complicated aspects of the carbon cycle and a tree's role within this.</p>	<p>Groups can use comments from peers to try and improve their model – give them some additional lesson time to achieve this.</p> <p>Follow-up by allowing groups to present their final models (including an explanation of what their model shows) to peers.</p> <p>Peer assessment using the level sheet.</p> <p>For higher ability groups, ask them to investigate how much 1 Gigatonne is and feedback to the class.</p>
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(3) The Forest Lifecycle

<p>To understand the different stages in the lifecycle of a tree.</p> <p>To appreciate the importance of trees in the wider forest ecosystem.</p>	<p>Books Magazines Internet access</p> <p>A place where there is room to move about</p> <p>Plain A4 paper Laptop</p>	<p>Role play of a forest lifecycle</p> <p>As a class, research/recap the lifecycle of a tree using the internet, books, magazines, etc. Students can take notes for their next activity.</p> <p>Split students into groups and ask them to create a role play which demonstrates the different stages or lifecycle of a tree. They should also consider the overall importance of a tree or woodland/forest in the wider ecosystem</p>	<p>ICT Citizenship Geography Science Drama Environment English Music</p>	<p>Students will be able to show through role playing the different stages that a tree goes through in its lifecycle. They will also demonstrate an understanding of the importance of woodlands/forests in</p>	<p>Link all of these role plays together as a mini-play which could be performed to other classes or even the whole school at an assembly.</p>
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<p>To express a point of view about deforestation.</p>	<p>Projector Paper Film clip Lined paper Large pieces of card Marker pens</p>	<p>(e.g. biodiversity, food webs, habitats, material for consumption, decomposition). They must ensure that everyone takes part in the role play.</p> <p>Groups may include the following as 'chapters' in their role plays (or perhaps each group could tackle a different component):</p> <ul style="list-style-type: none"> - from being planted as a seed, growing taller in the sunlight, photosynthesis, reproduction - storing carbon (linked into the carbon cycle) - being a habitat for wildlife and haven for biodiversity - a tree's role in food webs, i.e. how different species complement each other and rely on each other to survive - being consumed/used for material i.e. chopped down (what for? Is the tree going to be replanted? What are the impacts on the rest of the forest ecosystem?) - the process of natural decomposition from the tree itself to the leaf litter on the ground. (How does this facilitate the growth of new life?) <p>Present the role play to the class and feedback to each other.</p> <p>In small groups create a campaign song/rap about the importance of trees and the effects of deforestation. Perform this song/rap to the rest of the class and feedback on each other's performances – was the song or rap effective at getting their points of view across?</p>		<p>the wider ecosystem.</p> <p>Students will work together to creatively produce and perform a role play challenge.</p> <p>Students will collate and respect each other's points of view about deforestation and its impacts.</p>	<p>Have groups create a protest banner about deforestation of the rainforests. Can they relate deforestation to climate change?</p> <p>Walk around the school yard with the banners singing their protest songs, and start a deforestation petition to send to your local MP.</p>
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(4) The Benefits of Trees

<p>To appreciate the diversity of benefits that trees provide.</p> <p>To explore the importance of trees to humans.</p>	<p>Laptop Projector White board Sugar paper Card Magazines Internet access Marker pens</p>	<p>Overall benefits of trees</p> <p>Watch the 'A Convenient Truth' film about the benefits of trees.</p> <p>In groups, ask students to list more explicitly about the diversity of benefits (e.g. scientific, economic, social, recreational) that trees provide. The groups will then create a display</p>	<p>Science English Citizenship Geography Art Media Studies ICT DT</p>	<p>Students will consider and appreciate the diversity of benefits that trees provide, e.g. scientific, economic, social, recreational.</p>	<p>Groups may use the internet to collect information to add to the display board.</p> <p>Design challenge:</p>
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	<p>'A Convenient Truth' film Newspapers</p> <p>A4 paper Glue Felt tips Scissors</p>	<p>for the classroom wall about a tree's many uses. Each group will be given a large piece of sugar paper/card to use as their display board. On the sugar paper they could include pictures, diagrams, magazine cut outs, written information about a tree.</p> <p>Trees as a material Now focus on the material benefits (i.e. economic) that trees provide. Write a list of products in the room that are made from trees.</p> <p>In small groups, ask students to come up with ideas of what would happen if trees and woodlands/forests disappeared? Ask them to come up with their top 3 concerns.</p> <p>Back together as a class, introduce the word 'sustainable' and ask for definitions. Discuss/brainstorm about what we could use instead of wood for these products. Would these alternative materials/products be any more sustainable?</p> <p>Groups then to create posters on what it would be like to live without trees – present this as both an exploratory exercise and perhaps as a design challenge (see Extension). How would we build, write, create furniture etc? Present poster to whole class.</p>		<p>Students will then focus on wood as a material (economic) and consider its sustainable use to make many types of products.</p>	<p>Ask groups to sketch designs for new products (based on those that we use every day currently made out of wood) made out of other, sustainable materials.</p> <p>Present designs to class and vote on most interesting, realistic/feasible etc.</p>
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