



Forestry and carbon sequestration.

Teacher Overview

During this lesson, students will acquire skills in selecting appropriate research sources and data pertaining to the topic of carbon sequestration and storage in forests. A number of links from different sources have been included to introduce the principles of carbon utilisation in forestry and the advantages of this biological process. Students need to view the links and make decisions about the main points of the sources to include in their tabulated notes and finally in a group poster display on the topic.

Stage

Year 11 Agriculture

Syllabus Links

Outcomes

A student:

P2.1 describes the biological and physical resources and applies the processes that cause changes in plant production systems

P4.1 applies the principles and procedures of experimental design and agricultural research

Students learn about:

Recent research findings that contribute to plant production systems

Students learn to:

Use a range of sources to gather information about a specific agricultural problem or situation in plant production systems.



Lesson Overview

Introduction:

Students will be introduced briefly to the topics of; the greenhouse effect, climate change, carbon storage and carbon sequestration.

Activity One: Graphing task.

Students will view a link of a diagram that details the percentage of carbon contained in a tree and convert this diagram into an alternative graphical form.
(Approx 5-10 minutes)

Activity Two: 3 point data collection

Students will access a series of sources (multimedia, websites, research abstracts) and complete a table by selecting what they believe to be the 3 most important points related to the topic. It is encouraged that the teacher selects one of the sources as a class example and demonstrates the summary of main points. Students will need to choose at least one of their own source types to add to this activity. (Approx 30-40 minutes).

Activity Three: group poster presentation

Students should form pairs/groups and initially have a discussion to compare their main points (at this time that may decide to adjust their selections). The groups should then use this data to create a poster display on their topic. Teachers may decide to design a marking criteria or feedback sheet for this task.
(Approx 20-30 minutes).



Resources

- a) Student Worksheet
- b) Online Sources (links provided on the worksheet)

Activity One

<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74107.html>

Activity Two

	Source
1	http://ipm.ucanr.edu/PMG/PESTNOTES/pn74107.html Forestry Corporation sponsored website
2	http://ipm.ucanr.edu/PMG/PESTNOTES/pn74107.html (4.22) multimedia
3	https://www.youtube.com/watch?v=f5ANUD0cN0o (view until 4.47) multimedia
4	http://www.chiefscientist.gov.au/2009/12/which-plants-store-more-carbon-in-australia-forests-or-grasses Research journal abstract
5	http://timbernsw.com.au/timber-in-the-carbon-economy/ Timber NSW website
6	http://forestlearning.edu.au/images/resources/How%20carbon%20is%20stored%20in%20trees%20and%20wood%20products.pdf Forest learning student activity
7	Student choice Must be a different type than above.

Activity Three

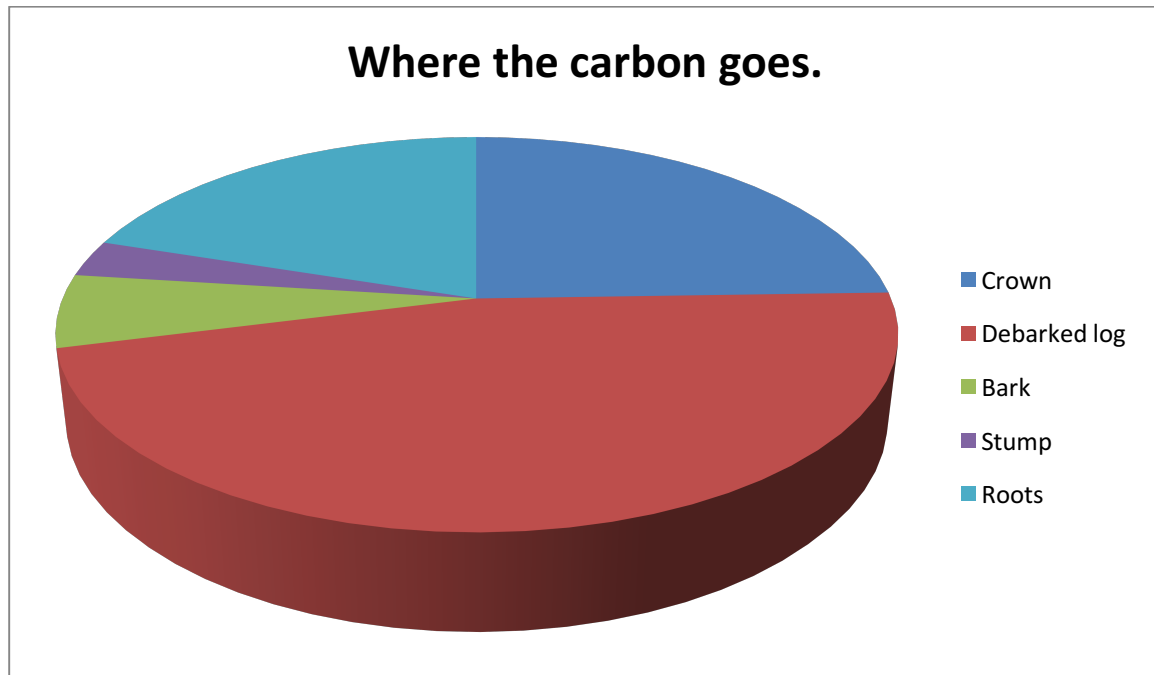
http://www.forestrycorporation.com.au/_data/assets/pdf_file/0009/437733/forests-carbon-cycle.pdf



Sample Answers

Activity One

(Other forms of graphs can be used to represent this data)



Activity Two – 3 point data collection

Source number	Source type	3 points (Answers will vary with individual student)
1	website	<ol style="list-style-type: none"> Growing trees absorb carbon dioxide from the atmosphere and store the carbon so efficiently that approx half the dry weight of a tree is carbon. Carbon sequestration decreases in rate with the age of a tree but the tree will store the carbon for hundreds of years. More than four million tonnes of carbon is stored in plantations and native forests owned by Forestry Corporation forests.



2	multimedia	<ol style="list-style-type: none"> 1. When a forest is harvested the carbon is in the product eg pulp, saw logs etc, some is emitted through burning of the site, and decaying residues and the new regenerated forest will sequester a lot of carbon. 2. Forest management is about balancing the growth and the harvest. 3. The carbon footprint of turning wood into products is relatively low compared to aluminium and steel and concrete (timber is a 10th).
3	multimedia	<ol style="list-style-type: none"> 1. One of the ways to decrease the ecological footprint of a building is to exploit the carbon in wood products. 2. Despite the positive carbon characteristics of timber some of the limitations are that you cannot build skyscrapers only 3-5 stories. 3. Wood has better insulating costs compared to other building materials.
4	Research journal abstract.	<ol style="list-style-type: none"> 1. One strategy to combat global warming and climate change is to utilise plant types to store carbon dioxide. 2. Based on data, forests are typically more than 10 times as effective as grasslands at storing carbon on a hectare per hectare basis. 3. Australian forests store about 10.5 billion tonnes of carbon.
5	website	<ol style="list-style-type: none"> 1. International climate panel "in the long term a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks while producing an annual sustained yield of timber, fibre or energy from the forest will generate the largest sustained mitigation benefit". 2. Forests have the potential to absorb about 10-20 percent of the total global emissions projected for the first half of the 21st century.



		<p>3. As one of the world's highest carbon emitters Australia also has a strong and growing need to develop markets for carbon abatement and renewable sources like wood waste.</p>
6	Student lesson plan	<p>1. Australian forests and wood products store or sequester approximately 57 million tonnes of carbon dioxide which offsets around 10% of the total greenhouse gases emitted in Australia. This takes into consideration a loss of carbon from forests each year of approximately 4.4 million tonnes due to prescribed burning, wildfires and wood harvested for energy</p> <p>2. For framing in our homes this carbon storage is life is around 100 years, around 30 years in furniture, 30 years in railroad ties and around 6 years in pallets and paper. Carbon stored in wood is only released back to the atmosphere when the wood product is burnt or decays.</p> <p>3. The amount of carbon stored in trees depends on a number of things including tree species, growth conditions in the environment, age of tree and density of surrounding trees. There are a number of ways you can calculate the CO₂ stored in trees and in wood products depending on the available information</p>
7.		<p>1. Students own answers.</p>



Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/).

Forest Learning

Is an initiative of Forest and Wood Products Limited and these resources have been developed by qualified educators and designed to assist teachers deliver the Australian Curriculum.