



ASSIGNMENTS AND RESOURCES



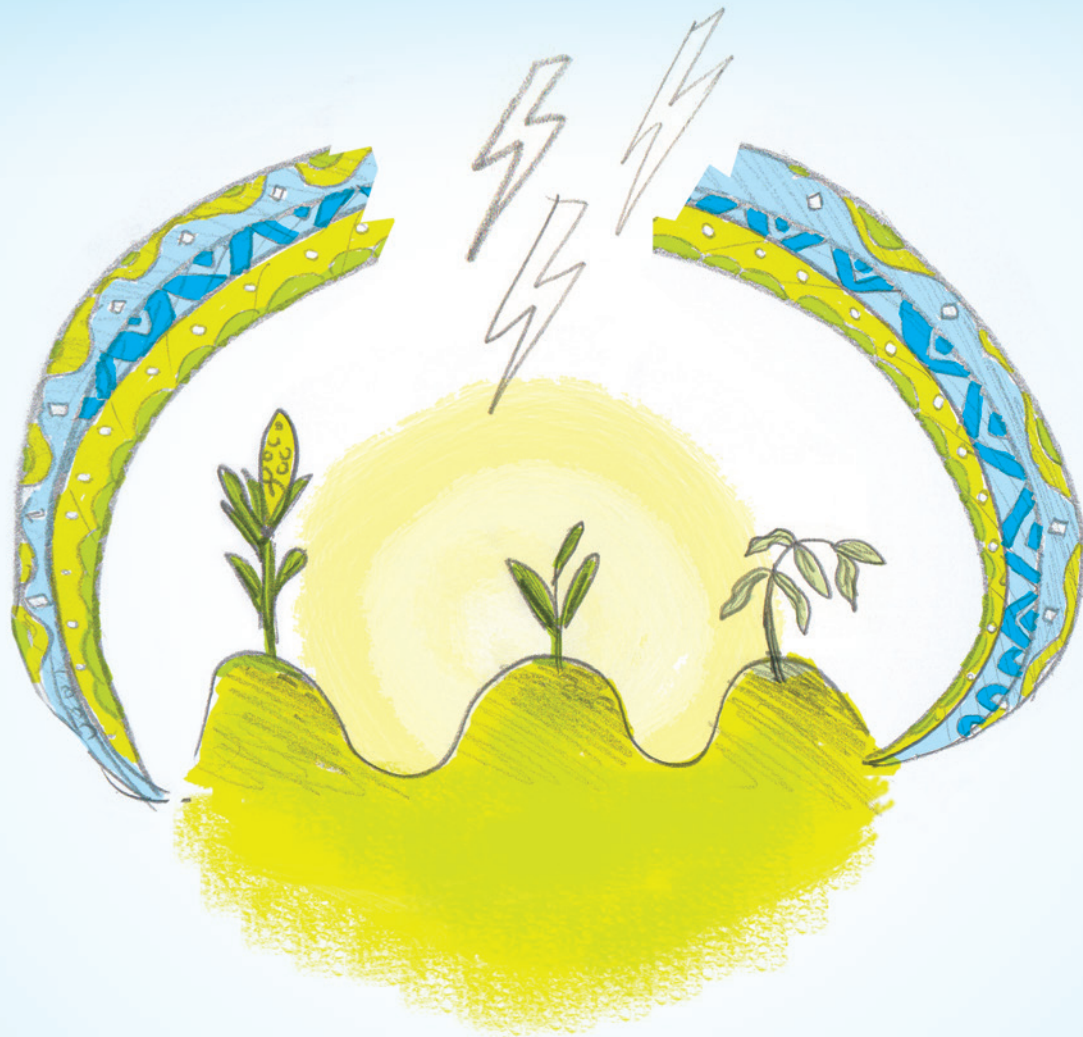
CLIMATE JUSTICE

**MORE TREES
PLEASE!**

Explore the **wonder and science of trees** and to discover the benefits there are in planting and protecting them in the **fight against climate change.**

selfhelpafrica.org/ie/education

CLIMATE JUSTICE



This activity series has been devised by Self Help Africa, an Irish international development organisation focused on supporting and empowering farming communities across Africa. SHA's vision is an economically thriving and resilient rural Africa, free of poverty.



**Self Help
Africa**

In March SHA launched a new campaign 'One Million Trees', aiming to plant 100,000 native trees in Ireland and one million in Africa.

Links to the One Million Trees campaign are in the further reading section, but for now to set the context of the work of SHA please take a look at this short video: 'Two ways to look at Africa.'



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Bush fire at Captain Creek central Queensland Australia

In response to climate change and towards the aim of sustainable development, the importance of trees and the urgent need to plant more has become a global focus. Even more so after the recent images of the Amazon and Australian wildfires.

Trees are vital for a sustainable future for a wide variety of reasons including: promoting biodiversity, improving air quality, providing food crops, fuel and materials and as a carbon store. Hence, tree planting is going on around the world at an unprecedented rate, and we have work to do here in Ireland, as we have the lowest percentage of land covered by trees in the EU (native tree cover is less than 2%). So tree planting is a significant part of Ireland's commitment to international climate commitments such as: The Paris Agreement 2015 and the UN Global Goals 2030.

KEY TERMS

It may be worth considering and defining these key terms to ensure you feel confident of their meaning:

<https://www.wikipedia.org/>

SUSTAINABLE DEVELOPMENT

BIODIVERSITY

CARBON STORE/SINK

NATIVE TREES

EXERCISES

So lets get started thinking about trees:

Consider these poetic quotes:

"The earth laughs in flowers." Ralph Waldo Emerson

"Trees are poems that the earth writes upon the sky"
Kahlil Gibran

Q: How do these sentences make you feel?

Q: What pictures are generated in your mind?

Q: How do you feel about laughter and artistic creations?

Q: Are they emotions/objects that are delicate, vulnerable, deserving of preservation or protection?

Q: Have you ever been in a wood and looked up through the tree canopy at the sky? If not, perhaps you should. You might notice how the branches do not touch, do you know why?

Perhaps trees are shy?

Check out the below link on 'crown shyness'
<https://www.thisiscoolossal.com/2017/08/the-phenomenon-of-crown-shyness-where-trees-avoid-touching/>

So it seems there is more going on in woodlands and with trees than we fully understand. Here is a quick pop quiz to discover how familiar we are with the world around us.

Draw out the below table in your copy and generate three lists under the following three headings (don't think too hard! And don't 'Google it' just write as many as come to mind. It's just for fun.)



List clothing & shoe brands	List takeaway restaurants	List tree species

Q: How did you get on? With the tree species not the takeaways!

If you managed more than ten before you were struggling, then well done! But how many were native Irish trees? Go back and tick your native trees.

Check here to be sure:

<http://www.irishwildflowers.ie/AZ-more.html#Trees>

Trivia knowledge to impress the folks at home/online!

Number of tree species in the world = possibly as many as **60,000**

Number of native tree species in Ireland = **23**

Q: Can you offer some ideas to explain why Ireland has, relatively, so few tree species?
 And also why such little woodland left?

Nature and wild places like woods/forests seem like they are random and peaceful places, away from the ordered and busy world we have created, but there is a lot more going on than it seems.

Here's a question; think of a woodland as a construction site with trees going up all the time but with no builders, how does a huge tree build itself? What could we build without; moving, noise, deliveries of materials or scaffolding? We couldn't build a tree without these things. So how does a tree do it?

Specifically where does the mass of a tree come from?

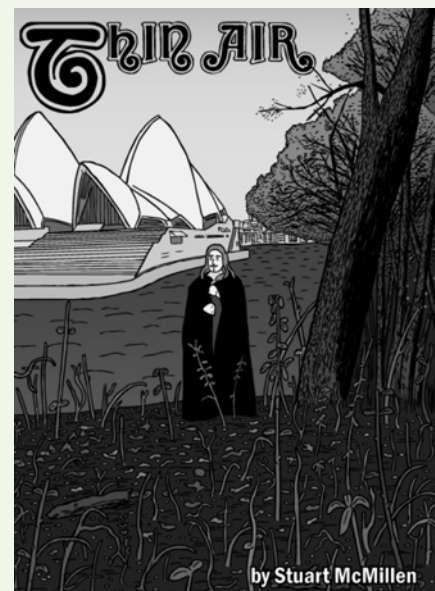
Write your ideas down first and then enjoy this comic:

<http://www.stuartmcmillen.com/comic/thin-air/>

Q: So what do you think of 'Thin air' and what trees accomplish?

Q: Did you learn something new?

Q: How effective was the medium of a comic to share the information?



Here is a totally different way to appreciate trees, an animation from the California Academy of Sciences

<https://www.calacademy.org/educators/travel-deep-inside-a-leaf>

How was that journey? Did you watch with the subtitles on? It is worth watching with and without the additional information. There is a lot happening in every leaf of every tree and plant, and we haven't even considered how trees get water from the ground to their crowns or what is going on in their roots! (see additional videos on the same website.)



Q: So why are trees important to us?

They are not just beautiful, highly evolved and possibly shy!

List their values, functions and uses;

(do this by drawing a mature tree and then adding your list around it, like a brainstorm or mind map exercise)



Trivia fact: It is estimated that a single mature Oak tree is a habitat (home) to 284 different species of insect alone!

Once you have created your tree values/uses diagram, take a look at the image in the further reading section (at the end of this document) and for greater detail visit: <https://www.treepeople.org/tree-benefits>

Q: Describe a benefit that surprises you and why?

One of the great benefits to us of trees is how they capture, absorb and store carbon. Carbon being a greenhouse gas contributing to global warming.

So lets get scientific! And also a chance to go outside. (taking all sensible precautions and following the current guidelines regarding physical and social distancing.)

Let's work out how much carbon a tree can absorb from the air, all the while releasing oxygen.

Methodology

This activity is adapted from a Green Schools resource

1. Pick a tree, a large one if you can and try to identify what species it is.

Tree Species: _____

2. Measure the circumference of the tree at standard chest height with measuring tape. (If you don't have a measuring tape what will you do? Use a piece of string and measure that)

Circumference of Tree (cm) : _____

3. Calculate the biomass of the tree:

Biomass is dry mass of a tree in kg including roots, trunk, branches and leaves. You can use the table below to approximate the biomass of your tree. Use the nearest value to the circumference of your tree.

Circumference (cm)	Tree dry weight (kg) (Biomass)
50	106
100	668
150	1,964
200	4,221
225	5,771
250	7,641
275	9,842
300	12,410
325	15,350

Biomass of your tree = _____ Kg

As trees photosynthesise, they use sunlight to combine carbon dioxide (CO₂) from the atmosphere with water and nutrients from the ground to form carbohydrates which make up the tree's biomass. CO₂ is taken in at a certain rate and builds the mass of the tree over time. Biomass is a measure of the dry mass of woody and leaf matter in kg.

Methodology (continued)

4. Calculate the tree's carbon content by dividing it's biomass by 2:

Biomass of Tree _____ kg ÷ 2 = **Carbon Content** _____ kg

5. Find out how much CO₂ the tree has absorbed in its life by multiplying the carbon figure by 3.67

Carbon content in Kg x 3.67 = CO₂ the tree absorbed in its life in Kg

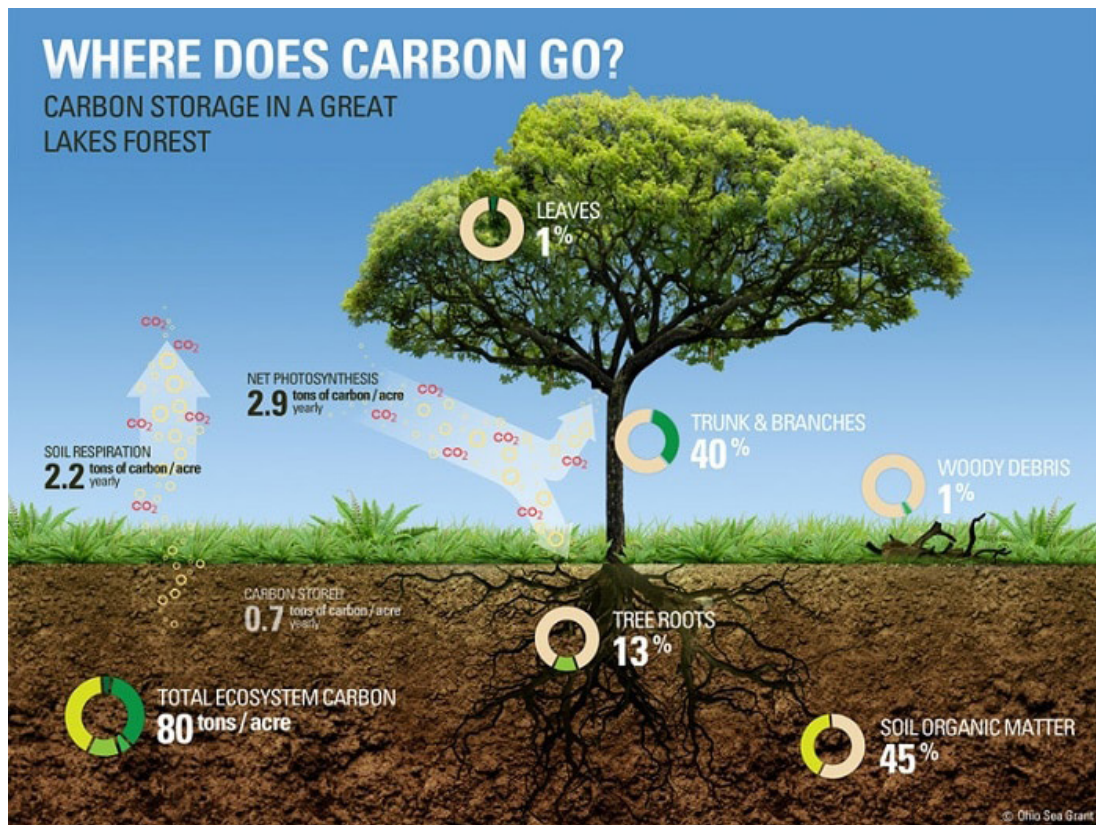
Result for your tree of CO₂ absorbed = _____ kg

The carbon content of a tree is approximately 50% of its biomass (dry mass). The other 50% is made up of hydrogen, oxygen and nitrogen and other elements.

Very roughly speaking, a tree absorbs up to 20 kg CO₂ per year = about 1 tonne of carbon by age 40.

FOOD FOR THOUGHT

Currently, an Irish person's lifestyle emits on average about 13 tonnes of CO₂ a year. A mature tree contains on average 5 tonnes of CO₂. We can now say that we each must plant between two and three trees per year to be carbon neutral. However, bear in mind that it takes quite a few newly planted trees to be the equivalent of one large tree. On the flip side young trees absorb carbon more quickly than old trees and with careful management the rate of absorption can be further increased.



So we need more trees!
For all the reasons you have listed and calculated.



TIME FOR ACTION

There is a popular quote; “the best time to plant a tree was twenty years ago, the second best time is today.” But it is very hard for most of us to plant trees, especially when hardly able to leave the house! So what action can you do? Well right now you can make a change that not only plants trees but is quite a radical statement; you can stop ‘Googling’!!

Consider changing your default search engine on your computer and phone from Google to ‘Ecosia’. Check out: <https://www.ecosia.org/>

You can also look into and raise awareness of Self Help Africa’s ‘One Million Trees’ campaign: <https://selfhelpafrica.org/onemilliontrees/>

And if you like yoghurts, ask whoever is doing the shop to look out for the Glenisk yoghurt products that partner and contribute to the fundraising effort.

Also make a point of learning about the UN Global Goals 2030 and telling people about them: www.globalgoals.com

CONCLUSION

Finally, to nail home the importance of trees, watch this to see the economic and health value of one tree, a SHA video:

Mary’s Mango:

<https://www.youtube.com/watch?v=sD4qcxczVvY>

And then multiply that impact up to billions of trees! Watch Africa’s Great Green Wall <https://www.bbc.com/news/av/magazine-41391844/why-is-africa-building-a-great-green-wall>

Let’s end with a positive, feel good tree quote:

Pick one from: <https://treesgroup.org/tree-quotes/>

Write it down and tell us why you chose it?

**WARNING: there may well be an online class quiz via the website Kahoots! Your teacher will share the link with you soon!*





Values & uses of trees

FURTHER READING/EXPLORATION

www.thisiscolossal.com

Endless examples of stunning art, science, & design

<http://www.stuartmcmillen.com>

Many thought-provoking and challenging comics

<https://www.calacademy.org/educators/travel-deep-inside-a-leaf>

Scroll down for further reading on the animation and to bottom of page for more great videos

www.treesgroup.org

Look in references for tree quotes, poems, music and jokes

<https://leafireland.org/>

Learning about Forests Ireland

<https://rgsgeogy.wordpress.com/mrcs-tree-carbon-content-calculator/>

How to work out the biomass and carbon content of a tree

<https://www.irishtimes.com/culture/heritage/native-trees-cover-just-2-of-ireland-how-can-this-be-increased-1.3553824>

History of Irish deforestation and attempts to replace lost forests

<https://selfhelpafrica.org/ie/>

Self Help Africa (SHA) website

<https://selfhelpafrica.org/onemilliontrees/>

SHA's One Million Tree Campaign

www.globalgoals.org

UN Sustainable Development Goals 2030