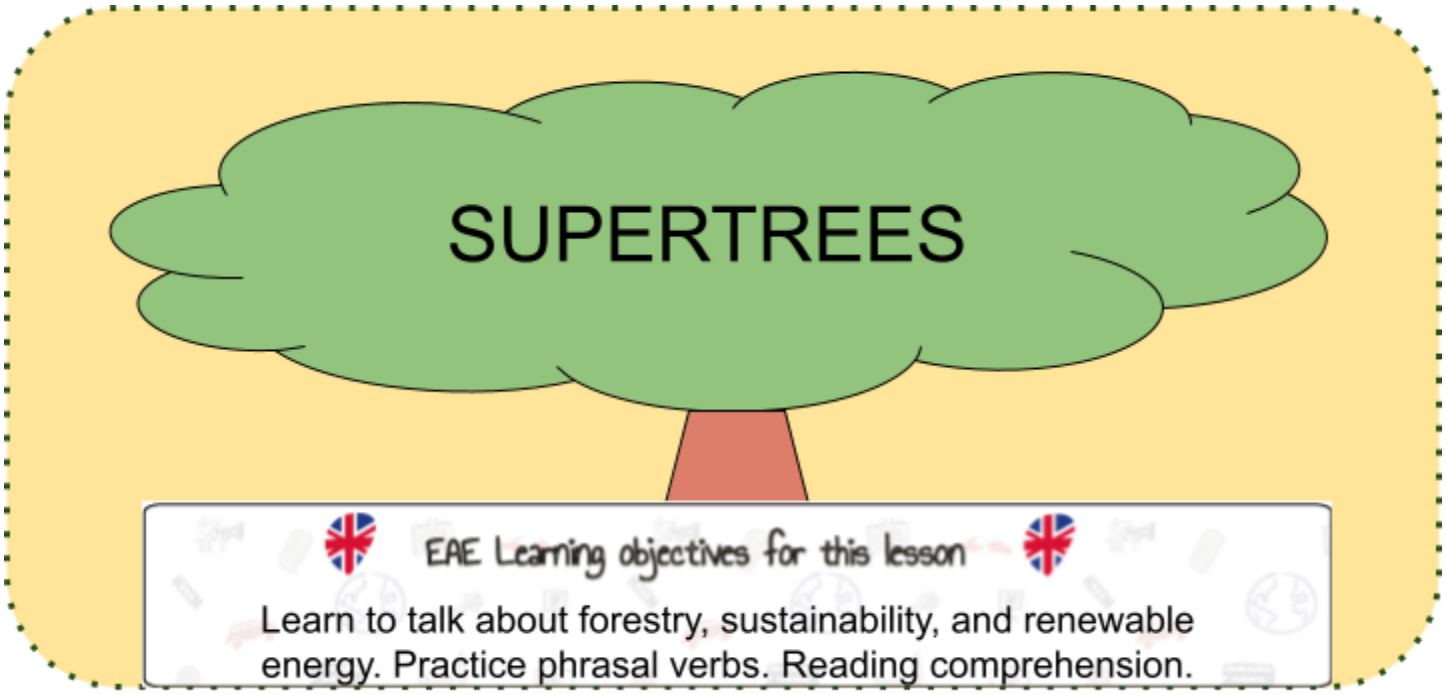


Activity 1 - Introduction



1. Is nature something that you take time to appreciate in your daily life?
2. What aspect of nature appeals to your most? Mountains, Lakes, Forests, Animals?
3. Do you often consider the consequences your actions have on the environment?
4. What do you think about when you hear the word ‘renewable’?
5. What do you think the future of renewable energy will look like in 50 years?

Activity 2 - Article

Source:
https://www.fastcompany.com/90646232/these-supertrees-are-engineered-to-capture-more-carbon

These ‘supertrees’ are engineered to capture more carbon

...But the introduction of genetically modified trees raises some difficult questions.

Part of the climate challenge isn’t just the transition to things like **renewable energy** and electric cars—it’s also about dealing with the **oversupply** of CO2 that’s already in the Earth’s atmosphere. By the middle of the century, by one estimate, the world may need to be pulling 10 billion metric tons of carbon dioxide from the atmosphere every year to be able to meet the goals of the Paris climate agreement. By the end of the century, that number could double to 20 billion tons per year.

That sparked the growth of “negative emissions” technology. Direct air capture startups, with machines that pull CO2 from the air, are **being backed by** companies like United Airlines. Capitalizing on trees’ ability to function as natural carbon capture machines, Reddit’s former CEO is now running a company that restores forests on degraded land (and recently raised $30 million in a Series A round of **funding**). Dozens of other companies are experimenting with farming seaweed, regenerative agriculture, and techniques like spreading crushed rock on the ground. And in the Bay Area, a company called Living Carbon is engineering trees that can capture and store more carbon than typical trees. The startup recently completed a stint at the prestigious tech accelerator Y Combinator.

“Planting trees alone is definitely helpful,” says Patrick Mellor, cofounder and chief technology officer at Living Carbon. “But any way that we can improve the total **drawdown** of carbon dioxide from **photosynthesis**, and also improve retention of that carbon, are ways to quite greatly increase the total drawdown potential of trees.”

If a forest can sequester more carbon than it otherwise would have, it also can help with the challenge of finding enough land for planting trees without competing with other uses such as agriculture. “What can you do so instead of planting 1 trillion trees, you only have to plant, you know, 500 billion?” says Maddie Hall, the company’s co founder and CEO. “Then you have a lot more **acreage** available for other things.”

The company plans to share more details about the technology later in the year, but it builds on previous research, including years of work from other scientists looking at how to enhance photosynthesis in other plants. Donald Ort, a scientist at the University of Illinois, “has been working for years with various collaborators to see if we can tweak photosynthesis,” says Steve Strauss, a professor of forest biotechnology at Oregon State University who is advising the startup and collaborating on research. “It is really hard to do. It’s a result of millions of dollars and decades of work trying to do this in a way where you do more good than **harm**, and most of the experiments have failed, because it’s really hard. Nature, of course, has been trying to do this for thousands of years, so you’re trying to improve on that.” (The potential harm, Strauss says, is that the trees might be more susceptible to stress and thus less healthy.)

Ort’s team focuses on tobacco, and in experiments has found that tweaking an enzyme in the plant could make it grow as much as 40% bigger than ordinary tobacco plants. For food crops, this type of photosynthesis hack could potentially help meet increased demand for food as the global population grows. For a tree, faster growth means that it can take up more CO2. Living Carbon is also developing a second innovation for the trees that slows the **rate** that the tree decomposes; the process will enable trees to take up copper and nickel, which act as fungicides. (**Fungi** speed the decomposition of wood, leading to loss of CO2.)

Planted at a large scale, the trees could make a difference. “If we could increase the drawdown potential of managed forests by 20% to 30%, and we can also increase the [CO2] retention by some similar value to that, we have made a large difference in terms of the total possible drawdown from those forests,” Mellor contends. “Improved photosynthesis, deployed in managed forests at a large scale, has the potential to get additional gigatons of drawdown over the current quantities.”

As has been the case with other **genetically engineered** plants, Living Carbon’s trees may face some challenges gaining acceptance. The company’s process, at least for some trees, means that the U.S. Department of Agriculture won’t designate the trees as GMOs; the USDA only regulates plants modified with so-called plant pests. But the Forest Stewardship Council, which certifies forests as “responsibly” managed and doesn’t allow any genetically modified trees in the forests it approves, may classify the trees differently. (Hall and Mellor wouldn’t comment on this, saying that they’re focused on their research efforts at the moment; they also note that the type of tree that they’re working with now, a poplar-aspen hybrid, can only reproduce via cuttings, and doesn’t produce **pollen** that could spread elsewhere, one of the issues that anti-GMO activists sometimes raise.)

Strauss argues that prevailing attitudes about genetic engineering are holding back other innovations that could also be critical now, such as helping trees survive changing conditions because of the climate crisis. “Why is the United States of

America so retrograde when it comes to biotech?" he asks. "Given the challenges, we should be testing **heat tolerance** in trees in the ground as we get hotter and hotter. And **drought** tolerance. There's all kinds of promising genes that we could be testing and essentially almost none of that's going on." The U.S. government should be funding this research, he says—not just Silicon Valley.

- **Vocabulary with translation**

Renewable energy = *energie renouvelable*
Oversupply = *sur approvisionner*
Be backed by = *avoir le soutien de*
Funding = *financement*
Drawdown = *abaissement*
Photosynthesis = *photosynthèse*
Acreage = *superficie, terres*
Harm = *mal*
Rate = *taux*
Fungi = *champignon*
Genetically engineered = *génétiquement conçu*
Pollen = *pollen*
Heat tolerance = *résistance à la chaleur*
Drought = *sécheresse*



Reading Comprehension Questions

- What has sparked the growth of negative emissions technology?
- What is United Airlines supporting / backing?
- What is the company 'Living Carbon' doing about the CO2 problem?
- What are the benefits of engineering trees?
- What is the potential harm of engineering trees?
- The genetically engineered trees discussed by Hall and Mellor don't produce pollen. Is this an advantage or disadvantage?
- What is holding back innovation?
- According to the article, what should scientists be testing now?
- What is your opinion on genetically modified trees?

Activity 3 = Phrasal Verbs

A phrasal verb is a combination of two or three words (a verb and a particle). A particle can be an adverb or a preposition. For example: break down, break up and break in. What is the difference between each of these phrasal verbs? As you can see, understanding phrasal verbs are so important to determine the meaning of the sentence. They are commonly used in English, so let's practice some of them today.

Now. Match the phrasal verb and their definition:

1 clean up	A find unexpectedly
2 come across	B investigate
3 cut down	C tidy
4 get away (with something)	D do without being noticed or punished
5 give in	E make something fall
6 look into	F make a calculation
7 work (something) out	G finish the supply
8 use up	H reluctantly stop

Try to make sentences using the phrasal verbs from the previous exercise. Bonus points if your examples can relate to forestry. For example: We need to work out the best way to plant more trees. NOTE: We can use phrasal verbs in different tenses, such as the past tense or the continuous ING form; For example: We are working out the best way to plant more trees / We have worked out the best way to plant trees.

Activity 4: Gap Fill

Using the phrasal verbs from the previous activity, complete the gaps in the sentences.

1. We will not _____ _____ with climate inaction for much longer!

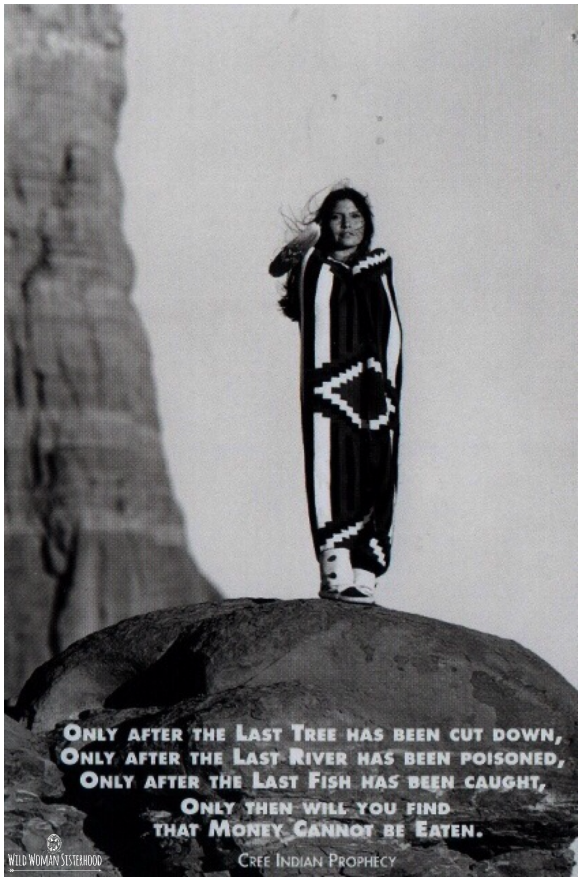
2. We need to be careful not to _____ _____ all of our resources.

3. Too many trees are being _____ _____ and not enough are being planted.

4. Environmental organisations are _____ _____ ways to save the forest

Activity 5: Discussion

Read the quote in the picture, and identify the phrasal verb used. What do you think of this quote?



Activity 7 : Listening comprehension:

https://www.youtube.com/watch?v=aY9QjlXaAAc
"How to Bring Wilderness Back to Britain | Rewilding UK"

Watch the first 1 minute 40 seconds of the video and answer the comprehension questions.

1. **What is the bisons' mission ?**
2. **Why were wolves reintroduced to the Scottish highlands?**
3. **Why is there doubt that large ecosystems can be restored in Britain?**
4. **What was the UK like in the past?**
5. **How much of the UK's land is used for agriculture?**
6. **What percentage of people are employed in agriculture?**
7. **What juxtaposition does the video speak about?**
8. **What do forecasts suggest will happen between 2015 and 2030?**
9. **What has this inspired?**

Activity 6: Song

https://www.youtube.com/watch?v=BmErRm-vApI Song: Say Something: A Great Big World Featuring Christina Aguilera

Listen to the song and identify the phrasal verbs used.

Say something, I'm giving up on you	I'm sorry that I couldn't get to you
I'll be the one, if you want me to	Anywhere, I would've followed you
Anywhere, I would've followed you	Say something, I'm giving up on you
Say something, I'm giving up on you	And I will swallow my pride
And I am feeling so small	You're the one that I love
It was over my head	And I'm saying goodbye
I know nothing at all	Say something, I'm giving up on you
And I will stumble and fall	And I'm sorry that I couldn't get to you
I'm still learning to love	And anywhere, I would have followed you
Just starting to crawl	Ooh, ooh say something, I'm giving up on you
Say something, I'm giving up on you	Say something, I'm giving up on you
	Say something

Activity 8. KEYWORDS = talking about the environment.

To deal with: to take action to do something, especially to solve a problem.

To Spark: to provide the stimulus for (an event or process).

The tipping point: the point at which a series of small changes or incidents becomes significant enough to cause a larger, more important change.

Pollution: the introduction of harmful materials into the environment.

To Allow: to give the necessary time or opportunity for.

When it comes to: when the specified subject is under consideration.

To mean: intend to convey or refer to (a particular thing); signify.

To meet a goal: to achieve something you are trying to achieve

Large scale: involving many people or things; extensive

Helpful: useful

To contend: assert something as a position in an argument. OR to struggle to overcome (a difficulty)

Greenhouse Gas: a gas that contributes to the greenhouse effect by absorbing infrared radiation. Carbon dioxide and chlorofluorocarbons are examples of greenhouse gases.

Drought: a prolonged period of abnormally low rainfall, leading to a shortage of water

Flood: cover or submerge (an area) with water in a flood.

Wildfire: a large, destructive fire that spreads quickly over woodland or brush

Use this vocabulary to give a 2-3 minute talk about the effects of deforestation.

Talk about the effects this can have in…

a forest environment
in an urban environment
in an agricultural environment
in a coastal environment.

How do we overcome the challenges posed by deforestation?

