Sustainable Flight

EAE Learning objectives for this lesson

Comprehension and discussion to improve your vocabulary and understanding.
Confusing words section to clarify some points.





Activity 1 - Questions

1. What does it mean to be 'sustainable'?
2. What can we use solar energy for?
3. What other types of sustainable energy are there?
4. Which one do you think is the most promising for the long-term future, and why?
5. Are you aware of any recent break-throughs with sustainable technology?

Activity 2 - Are you confused yet?



Some words make people confused, like the difference between **FOR** and **SINCE** as well as **TEACH** and **LEARN.** Let's see if you can get them right with this quick gap fill with your partner.

FOR and SINCE: We use for when talking about a period of time and since for a specific date or time period

FOR: For 5 minutes / for many hours / for 10 years
SINCE: Since 1980 / since 2001 / since World War I / since I was young

When you **TEACH** you give out information. And the person receiving that information **LEARNS.**

With a Partner (Do NOT prepare at home) Let's see who can fill the gaps correctly the most quickly.

1. Running tap water ……..2 minutes uses to 11-19 litres of water.
2. A compact fluorescent light bulb uses 75 percent less energy than the regular bulb and in can ……. up to 4 years
3. Modern wind turbines have been built ……. the early 1940s
4. Water power has been used ……. grinding grain for more than 2,000 years
5. Geothermal power plants have been opening ……. 1921
6. ……. the end of 2012, the worldwide capacity of wind turbines in operation has been over 282,000 MW.
7. There is an ever increasing consumption of oil and gas. There are over six billion people on Earth now, nearly double …….. 1960
8. The United States and Europe have been consuming a disproportionate amount of energy …….. 150 years
9. …….. many years people have been trying to move to sustainable energy. It is a difficult transition, but it is vital.
10. If a typical light bulb stays on …….. 1 hour, it uses an average of 60 KWs of energy
11. We should teach our children about the importance of sustainable development.
12. Everyone has to …….. how to act in a responsible way towards our planet.
13. It's impossible to …….. someone about sustainability if they just don't want to ……..
14. Future generations have to …….. about the different techniques for sustainable energy.
15. We need to ……. future generations to respect the planet.

Activity 3 - Watch the **video** and answer the comprehension questions:

http://www.independent.co.uk/life-style/gadgets-and-tech/news/solar-impulse-plane-begins-first-sunpowered-flight-around-the-world-10095255.html

Questions



1. What is the name of the company?
2. What was the pilot's mission?
3. What is the weight of the plane equivalent to?
4. What will be the average speed of the plane?
5. What do you think about the design of the plane?
6. Is this the future of air travel? Explain your answer

Activity 4 - Vocabulary match - Please prepare at home.

Match the word to the correct definition by drawing a line from one column to the other.

WORD	DEFINITION
Arch	weak and delicate
Span	travels at low speed on the ground
Frail	long and slim
Airstrip	the piece of ground specifically for take-off and landing of aircraft
Struts	moves slowly and lightly in liquid or the air
Predawn	The time before dawn (dawn is when you see the first appearance of light in the sky)
To Don	something down successfully with great skill, effort or courage
To Taxy	a bar that forms part of the framework to help support the structure
Noses	the front end of the aircraft lifts first when taking flight
Rangy	extremely wet, all the way through
To Float	to wear proudly
Achievement	the full length of something from end to end and the amount of space it covers
Soaking	the front end of the aircraft lifts first when taking flight
Soaking up the sun	a curved shape

Activity 5 - Read about this ambitious feat - **SUSTAINABLE FLIGHT.**

The wings of the experimental aircraft **arch** more than 63 metres, the same **span** as an Airbus A340, but they look **frail**, supported on the **airstrip** by wheeled **struts**. They are covered in a patina of 11,268 photovoltaic cells, which look dark blue in the grey **predawn**. The four 10-horsepower propellers they power now start to spin silently. Bertrand Piccard a 55-year-old explorer and psychiatrist, **dons** his helmet and oxygen mask and completes his final checks. The Solar Impulse quietly **taxies** forwards. The plane is travelling impossibly slowly – 30km an hour – when it gently **noses** up and leaves the ground. With air beneath them, the **rangy** wings seem to gain strength; the fuselage that on the ground seemed flimsy becomes elegant, like a **crane vaunting** in flight. It seems not to fly, though, so much as **float**. Piccard spends the day wheeling the solar-powered plane around the Matterhorn and lands 12 hours later, after sunset. But the Solar Impulse is a plane that would fly for ever.



This summer, it limited itself to crossing the US. It took off from San Francisco in May and flew past the Statue of Liberty before landing at JFK in July, traversing the country in five stages, with Piccard and the other co-founder of the project, André Borschberg, a former fighter pilot in the Swiss air force, swapping places in the cockpit. The flight was a remarkable **achievement**: the Solar Impulse flew further than any solar-powered aircraft before.

The plane that crossed America is a prototype, with the name HB-SIA. Its successor, the HB-SIB, currently being built, will try to circumnavigate the world in 2015, using about as much power as a scooter does. With no rival, it will have the skies to itself, but on land and on sea, too, a new generation of solar-powered vehicles is making extraordinary journeys, around the world and across continents. Solar power can seem the least exciting of clean energy sources: it just sits there, **soaking** up the sun. At least wind turbines turn. Now, though, a number of projects across the globe are pushing the boundaries of technical knowledge and coupling them to **daring** and demanding adventure. That the technology involved might also one day save the planet is a nice bonus.

For Extra Work - Read the rest of the article: http://www.theguardian.com/technology/2013/aug/25/solar-power-transport-travel-technology

Activity 6: READ SOME INTERESTING FACTS

- Bertrand Piccard is the pilot
- His father, Jacques Piccard, piloted a submarine to the deepest point on Earth, seven miles underneath the sea to the Mariana Trench
- His grandfather, Auguste Piccard, a physicist and friend of Albert Einstein's, invented a balloon that he flew to a record height of 10 miles.
- All three generations of the same family are ground-breaking adventurers, determined to push the boundaries of what is possible

Activity 7 - **Solar power implementation**

You and your partner are proposing a sustainable way to save energy at your workplace. Explain what you will do and how it works?

Activity 8 - **Riddles -** Each riddle describes a sustainable or unsustainable form of energy Guess which it describes and say if that source of energy is sustainable or not.

Solar power **Wave power** **Wind power**
Oil **Gas** **Coal**

A/
Rumours say, there are wars over this,
Some people say the smell is pure bliss,
It's from dinosaur poo? No that's a prank,
Put in the nozzle and fill up the tank

B/
It's a bright beacon, so far away,
It will be out on a beautiful day,
The greenest of all, this energy is
Now we just need to harness it

C/
Think of Chicago,
What's it's nickname?
This blows and it carries,
light things away

D:/
Black as night, and hard as nails
Emits the biggest Co2 trail,
Industry bound, and mining found
Powering steam trains all through the towns

E/
Surf's up, get your board,
And go ride a big one,
But during a storm,
these sure are no fun

F/
This is produced when one must fart,
And we step on it, to make the car start
You can use this to cook, but it stinks out the room
Don't light a cigarette, or your house will go boom

Activity 9 - Role plays…

1. You work for Richard Branson and Virgin, and you propose solar air travel. You must give good arguments as Richard is not convinced it will be a viable option for future commercial air travel.
2. You are a property developer. You tell a window fitter that you want solar panels on your house. He advises against such an expensive option but you try to highlight the benefits for saving energy.
3. You live in a little town. You want to start a sustainable energy program. But there is no wind to build a wind farm, and no nearby coast for wave energy. You propose a solution to the mayor.
4. You are a large environmental organisation who has secured financial backing for the implementation of a wave energy farm to ensure that water is pumped into reservoirs and electricity can be generated for many surrounding areas. You run up against permit regulations and need to propose and argue your point in order to get permission to start the project.

