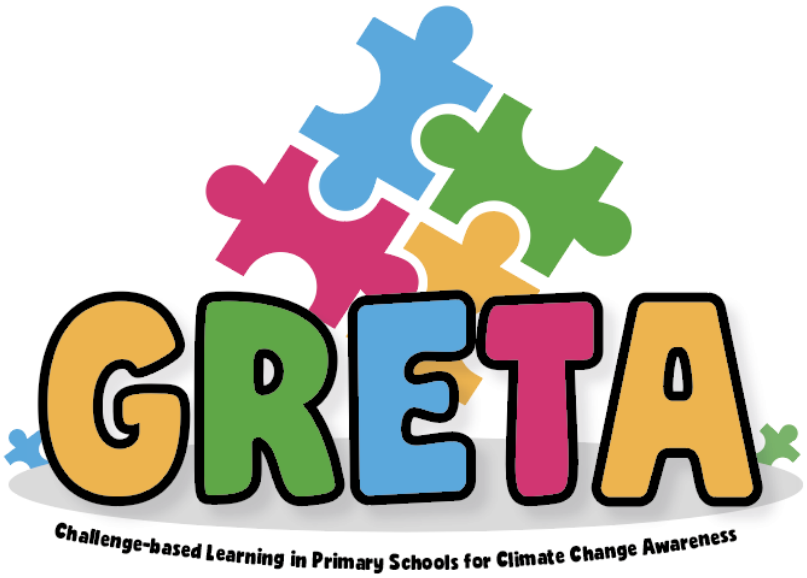
WebQuest

Advanced Level -

Fossil Fools



Co-funded by the
Erasmus+ Programme
of the European Union

TITLE OF THE WEBQUEST:	Fossil Fools
LEVEL OF THE WEBQUEST	Introductory Level

INTRODUCTION

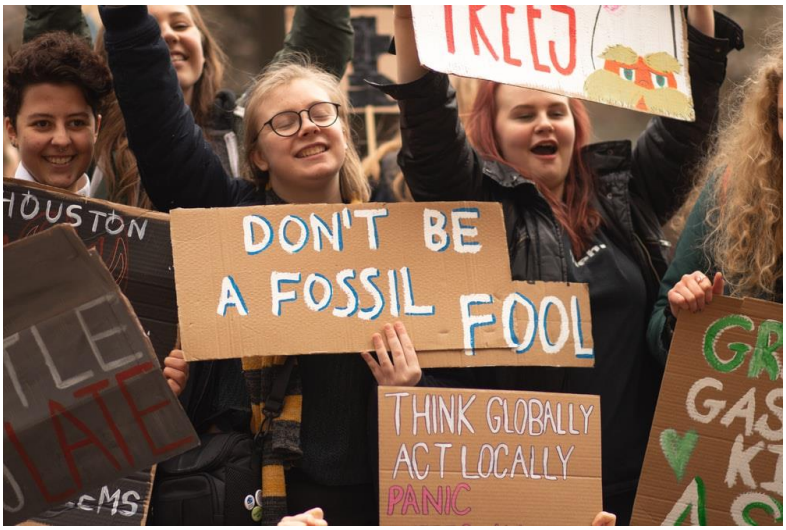
DID YOU KNOW?

Millions of years ago, even before the dinosaurs, the Earth was covered in giant tropical forests where many plants and animals lived. When these plants and animals died, their remains were exposed to pressure and heat underground in the earth's crust for millions of years, and eventually, they transformed into fossil fuels!

Fossil fuels are one of the most important sources of energy in today's world. They are burned for energy to heat our houses, provide us with electricity, and to fuel our transportation vehicles like cars, buses, planes, and boats. The main fossil fuels used by us today are coal, natural gas, and oil. These fossil fuels are located underground, and are taken out in different ways:

- Coal is a solid fuel and has to be mined from the ground
- Natural gas and oil are liquids and have to be drilled until they flow to the surface

These fossil fuels are non-renewable resources, meaning that there is only a limited amount of coal, gas and oil, and it is not possible to make more. With the growing demand of energy over time, we are running out of supplies of fossil fuels. As the energy produced from fossil fuels is essential for us to live, what will it happen when all the supplies will be used? It is important that we find alternative sources of energy that will not run out.



Co-funded by the
Erasmus+ Programme
of the European Union

TASKS

You and your classmates are going to conduct a “coal mining” experiment using chocolate chip cookies, yummy!

In small groups of 3-4 classmates, you are going to pretend to be coal miners, and you are all going to try and extract the coal (chocolate chips) from the ground (cookie). After mining for the coal, you will discuss with your groups the appearance of your cookies before and after mining for the chocolate chips, and then come up with possible negative effects of coal mining.

In this WebQuest, you will be guided through a series of steps to learn more about energy and how we can reduce fossil fuel consumption and why it is important to use renewable energy sources in the future to produce electricity and heat.

PROCESS

Step 1: Why burn them?

You might be thinking, how can energy be produced from fossil fuels?

Fossil fuels contain stored energy, so we need to burn them to create heat energy so we can use it for electricity, and light, and to power our vehicles.

Click on the links below to find out more about energy:

- What is energy? https://www.youtube.com/watch?v=1JipKb0xHrU
- What are energy sources? https://www.schule-und-familie.de/wissen-wusstest-du-dass/professor-stachel-erklaert-kindern-die-welt/was-sind-engergiequellen.html

Energy is needed for many things in our daily lives, but when we burn fossil fuels for energy, gases are released into the atmosphere. These are called greenhouse gases, and carbon dioxide (CO_2) is one of the main greenhouse gases. They are called greenhouse gases because like greenhouses, they trap heat, and do not let the warmth escape! Greenhouse gases are the reason why our earth is warm enough for us to live on, so what is the problem with burning more and more fossils fuels to release more of these greenhouse gases? Well, too much of these greenhouse gases in the atmosphere, are causing the earth to heat up too much, causing climate change.

Click on the links below to find out more about the effects of climate change:

- Climate change effects - https://youtu.be/E1ZC0FT8z24
- Greenhouse effect - https://youtu.be/5ijfVTLZFVE

Is there a better alternative? Yes, it´s called renewable energy. "Renewable energy" is the term used to describe electricity, heat and fuels that we can obtain from the sun, wind, hydropower or certain plants. This form of energy from nature is called "renewable" because its sources - the sun and the wind, for example will always be available to us humans. After all, the sun cannot be switched off and the wind does not suddenly stop blowing.

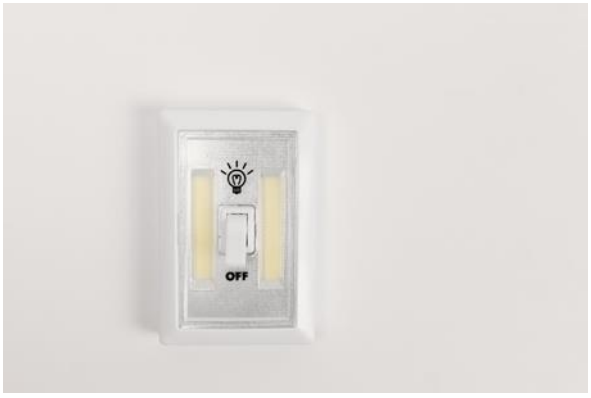
Let's learn more about renewable and non-renewable energy!

- Renewable and non-renewable energy- https://www.youtube.com/watch?v=_FcKxgfgc2k
- Reneweable energy, how it works, and its benefits - https://youtu.be/LKn1RztgS0c

Step 2: What is electricity?

In order to understand how to reduce our fossil fuel consumption, let´s first have a closer look at what electricity is. Do you know where electricity comes from? It comes from power plants. Many of them are coal power plants that burn fuel and use the heat that run a machine that makes electricity. The electricity travels in power lines to get to our homes. And this is how we can use it to turn on the lights, watch television, store food in the refrigerator, heat up water for showering and much more. These power plants that make electricity release greenhouse gases like carbon (CO_2). Too much is dangerous for the environment so if we use less electricity, the power plants will make less electricity and release less CO_2 in

the air. Your carbon footprint is the amount of carbon released into the air because of the energy you use. Do you turn your Xbox after you played? Do you turn lights, TVs, computers off when you don´t need them? If you unplug any electronic gadget when they are not in use you can help reduce the production of greenhouse gases and save the planet!



There are also special light bulbs you can use which helps save more energy. They are called CFLs and they are fluorescent! If you don´t have it, you should get one! They look cool and save a lot of energy.

- What are power plants? https://www.youtube.com/watch?v=6lMMOptZEEc
- How is our electricity generated? - https://www.youtube.com/watch?v=N5WWw0u_dNE
- Save Energy - https://www.labbe.de/blog/Energie-sparen
- Tips to help save energy - https://www.youtube.com/watch?v=GmeymL6kKeo

Step 3: Activity time!

It's time to go mining for some coal! You are all coal miners now. Your cookies are the ground, and the chocolate chips are the coal you are mining! In your groups of 3-4 students, each of you take a toothpick, and begin "mining" the chocolate chips from the cookie. You have 5 minutes to take out as many chocolate chips as you can!

Answer these questions after completing this activity:

1. Can the cookie return to its original state?
2. How has the cookie changed?
3. Are the chocolate chips a renewable source? Why?
4. Would it be good or bad for the environment if we stopped coal mining? Why?
5. What else can we use to generate electricity that doesn't require us to mine for coal?

EVALUATION

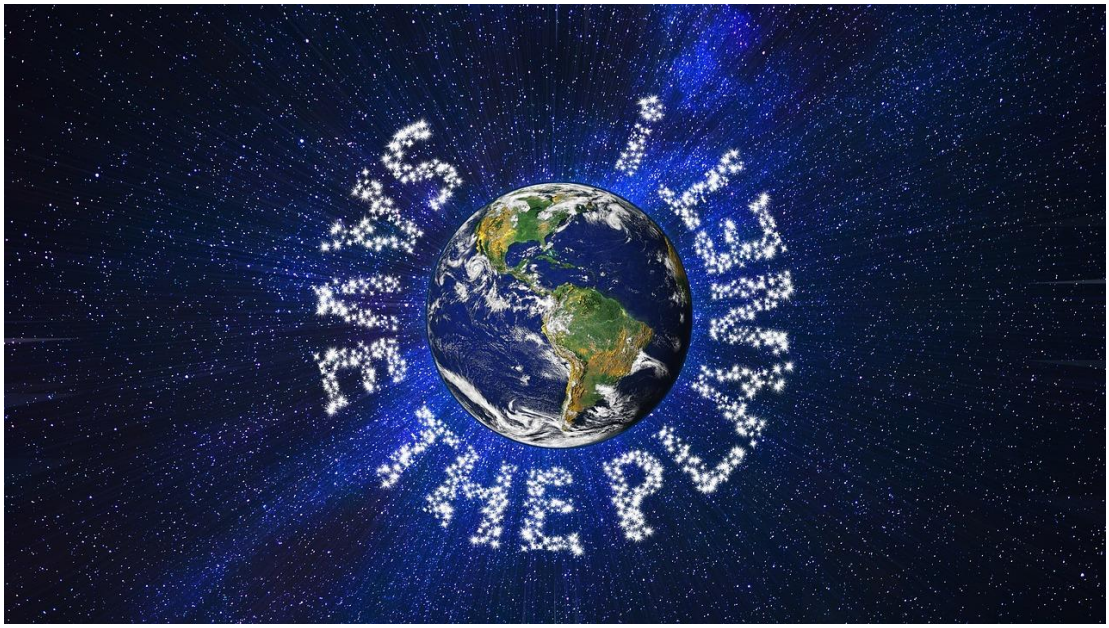
The teacher can use these questions to find out how the students felt about this WebQuest:

- What did you learn about energy?
- Why are fossil fuels dangerous for our health and the environment?
- Why is it important to reduce fossil fuel consumption?
- What are alternatives to fossil fuels?
- What are the aspects you enjoyed about the activity?

CONCLUSION

In this WebQuest you have gained knowledge about fossil fuels and why they are so important to us. Fossil fuels like coal, gas and oil are our primary source of energy. We need them to produce electricity, heat and fuel. However, burning fossil fuels to produce energy causes air pollution and global warming which is extremely dangerous for our health and the environment. They are not only harmful for the environment, they are also limited, and due to high demand of energy in the world, we are running out of supply. You have acknowledged that it is best to save energy in order to reduce fossil fuel consumption, however, in order to slow down climate change, electricity, heat and fuels should only be generated from renewable energy sources in the future. Opposite to fossil fuels, renewable sources such as wind and solar energy are inexhaustible and will always be available to us.

Save power, save the planet!



GRETA

Challenge-based Learning in Primary Schools for Climate Change Awareness

Istituto Comprensivo "Don Milani" di Lanciano

Co-funded by the Erasmus+ Programme of the European Union

"The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein."
Project Number: 2020-1-EL01-KA201-078808