



WebQuest
Introductory level-

Fossil Fools





TITLE OF THE WEBQUEST:

Fossil Fools

LEVEL OF THE WEBQUEST

Introductory Level

INTRODUCTION

Fossil fools: *Those who use fossil fuels without caring about the impact on the environment*

Fossil fuels or mineral coals, oil, coal, natural gas, were created millions of years ago by plant or animal organisms buried under tons of soil and rock. We find them by digging deep into the earth, we bring them to the surface, we process them, and we burn them to power our machines. The factories, the transportation, and the heating systems in our homes all use fossil fuels. You should know that even when you turn on the lights or your computer in your home, a factory far away is using oil, gas or coal to generate electricity to run the appliances in your home. We know that our whole life today depends on burning fossil fuels.

But this comes at a very high price: our planet is polluted every day because the burning of fossil fuels releases large quantities of substances that are harmful to the environment and to human health. Scientists now know that exhaust fumes are the cause of many of the world's diseases, that our planet is overheating, that the ice at the poles is melting, that sea levels are rising, that areas of the earth are being flooded, and that there are long periods of drought or catastrophic storms.



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Yet we continue to behave foolishly: although we are aware of the devastating effects of the reckless use of fossil fuels on life on our planet, we persist in this reckless use. In this way, day after day, we look as if we are moving toward an abyss, ignoring the danger that lies ahead.

How can we behave more intelligently in the face of this situation? Can we do without machines that consume fossil fuels? This web exploration will help you provide answers ...



TASKS

The negative effects of burning fossil fuels in all the countries of the world are prompting the leaders of the countries to hold urgent meetings. In Brussels, the representatives of the countries of the European Union propose the creation of wind farms in the European seas in order to produce green energy to replace the generation of electricity from fossil fuels. For this reason, European countries are launching a contest for the best design of a wind turbine that floats in the sea and produces cheap electricity (<https://bit.ly/3jJrdWu>).

You and your classmates decide to enter this contest, in which you are asked to:

- Present a model of a wind turbine that will float in water and is made of simple materials.
- Accompany the wind turbine with a showcase to explain to the world:
 - o (a) What are fossil fuels and why burning them has a negative impact on the environment and climate
 - o (b) What are renewable energy sources and what are their benefits
 - o (c) What exactly does your wind turbine do and how did you build it.

Good luck! The future of renewable energy in the European Union is in your hands ...



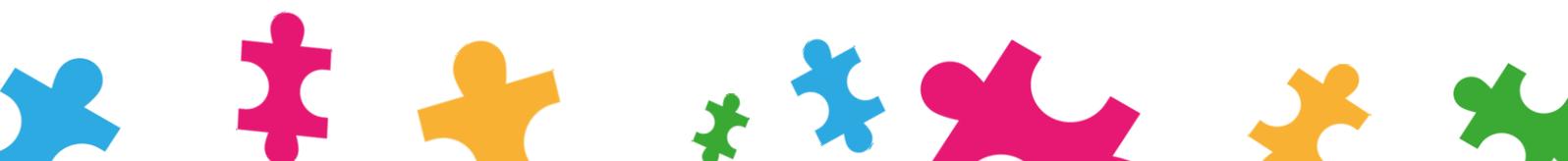
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PROCESS

STEP 1. I discover the floating wind turbines

First you study images from the floating wind turbines as well as related videos:

- <https://bit.ly/3CBD8OY>
- <https://bit.ly/2VB0YtA>
- <https://www.youtube.com/watch?v=sgCA5e7K7r8>





- <https://www.youtube.com/watch?v=C-y9dEzKcF8>
- How to set up a wind turbine: <https://www.youtube.com/watch?v=RjfWNN1FrUY>

You then examine drawings depicting different types of floating wind turbines as well as some technical details of them:

- <https://bit.ly/3IJMoKS>
- <https://bit.ly/3izwiRQ>

Different types of wind turbines:

- <https://bit.ly/3fL715u>

STEP 2. Why floating wind turbines?



In a second stage you seek to discover what floating wind turbines offer and why they are considered today an important solution against climate change.

First, you should know that floating wind turbines, like all ordinary wind turbines, generate electricity with the power of the wind. The wind turns a blade that is connected to a special machine (electricity generator). In this way, electricity is generated that goes to the switches and outlets in our homes. And because the power of the air can continuously move the electricity generator, it is preferable to the generators we run on fossil fuels, oil, coal or natural gas. They are even preferable for another very important reason: For a generator to run on fossil fuels, oil, coal, or natural gas must be burned, which releases large amounts of harmful gases into the atmosphere. Since this is the only way, we have ever known to generate electricity, the burning of fossil coal has polluted the atmosphere so much that it has changed the climate of the entire planet.

(a) Fossil fuels and the harmful effects on the environment

Follow the links to learn more about fossil fuels, which we also call non-renewable energy sources because the more we use them, the more they are depleted until they are completely exhausted at some point in the future.

- <http://www.allaboutenergy.gr/Piges22.html>
- <https://sites.google.com/site/energeiakaperiballonalexk/symbatikes-peges-energeias>





- <https://www.sutori.com/story/me-ananeosimes-peges-energeias--U4ZzJ1Aj5yY59wdgXwHPd8Ed>

The following links present the harmful effects of the burning of fossil coals on the environment:

- <https://bit.ly/37zTeKF>
- <https://bit.ly/2U67ZBH>
- <https://bit.ly/3AwBfB0>

(b) The advantages of renewable energy sources

"Renewable Energy and Climate Change: Everything You Need to Know": <https://bit.ly/2VB7u2Z>

Videos about the advantages of renewable energy sources:

- <https://www.youtube.com/watch?v=T4xKThjKaE>
- <https://www.youtube.com/watch?v=RjfWNN1FrUY>
- Video on the advantages of wind energy (Greek language only):
<https://www.youtube.com/watch?v=nLccPozW1lY&t=58s>

(c) The advantages of floating wind turbines

Floating wind turbines have more advantages than the usual wind turbines that are placed on land. First, they can be placed on the open sea where strong winds blow and provide a lot of clean energy. Secondly, precisely because they can be placed far from land, they are not visible and therefore do not interfere. And finally, they cost less to build. Consult the links below.

- <https://www.kathimerini.gr/society/348724/lysi-me-plotes-anemogennitries/>
- <https://bit.ly/3yB5l0z>
- <https://energy-world.gr/pos-tha-moiazoun-oi-plotes-anemogennitries-tou-mellontos/>

STEP 3. Construction of a floating wind turbine model

The biggest challenge in building the floating wind turbine is not only keeping the impeller on a floating platform, but also withstanding the waves of the sea. But the challenges are for the engineers! Equipped with the materials described below, build a model of a floating wind turbine that:

- can float in the water
- can set its impeller in motion with a stream of air generated by a fan
- does not sink due to the waves

Good luck!

(a) Materials available

- Cardboard





- adhesive tape
- weights
- plasticine
- craft sticks
- double nails
- straws
- aluminum foil
- pencils
- string
- floating materials such as plastic bottles, cups, corks, ping pong balls
- container with water to test the floating windmill

Here are some templates and instructions to draw a winged pinwheel yourself or simply print it out and assemble it:

- <https://sie.ag/3s3Cy7A>
- <https://www.easy-crafts-for-kids.com/paper-windmill.html>
- <https://www.firstpalette.com/printable/pinwheel.html>
- <https://www.pbs.org/parents/printables/pinwheels>
-

(b) Design

Design how you imagine your floating wind turbine model

(c) Build

Build the floating wind turbine with the materials available and according to your design

(d) Test

Put your wind turbine in the water and test its tolerances. Do not be disappointed if it does not make it... You will most likely need to make improvements.





(e) Improve

Improve your design as often as necessary to get your hands on a truly reliable floating wind turbine!

STEP 6. Create awareness

Now is the time to let the world know what efforts you have made for the environment! Talk about how foolish it is to use fossil fuels and that we can use our minds and creativity to get rid of them and protect the environment. Prepare a presentation to display in the hallway of your school that includes your model, information about the problems fossil fuels cause for the environment, the benefits of renewable energy sources, and how you designed the floating wind turbine model that can produce abundant and clean electricity.

Here are links that can give you some ideas on how to set up your display:

- <https://www.sprep.org/sites/default/files/images/news/migrated/P1070289.JPG>
- <https://bit.ly/2U4px11>
- <https://www.greenwichschools.org/north-street-school/pta/whatwedo/stem-fair/stem-fair-2016-highlights>

EVALUATION

Together with your teacher, evaluate your presentation using the rubric found at the following link:

<https://www.rcampus.com/rubricshowc.cfm?sp=true&code=UX548B6>

Choose rubric language by right clicking on it.

CONCLUSION

Congratulations on your efforts and the amazing result! Your work conveyed a strong message to the school community against the use of fossil fuels. The model of a floating wind turbine you built shows the future of using clean energy sources. This Web Quest concludes with the hope that your design will be used to improve living conditions and counteract the negative effects of burning fossil fuels, which have now accumulated to dangerous levels for humanity.

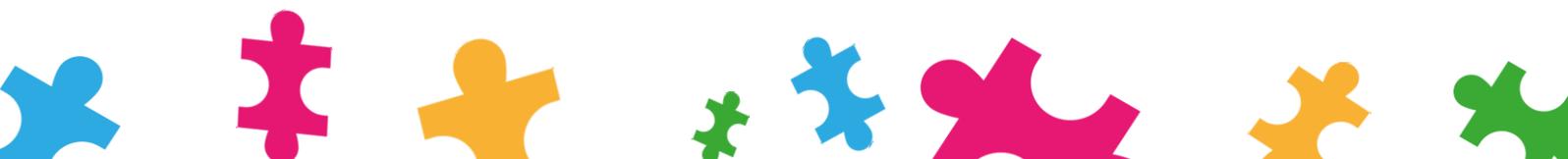
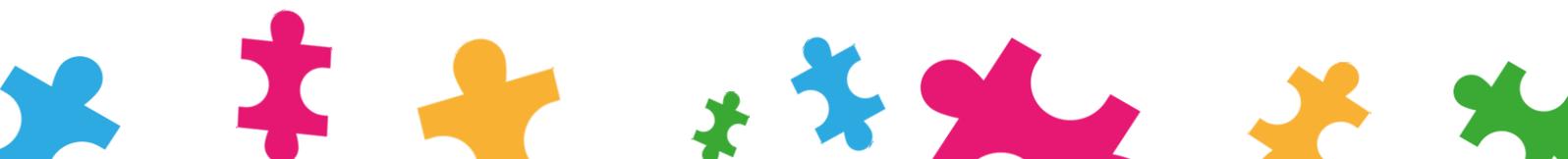




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GRETA

Challenge-based Learning in Primary Schools for Climate Change Awareness



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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

