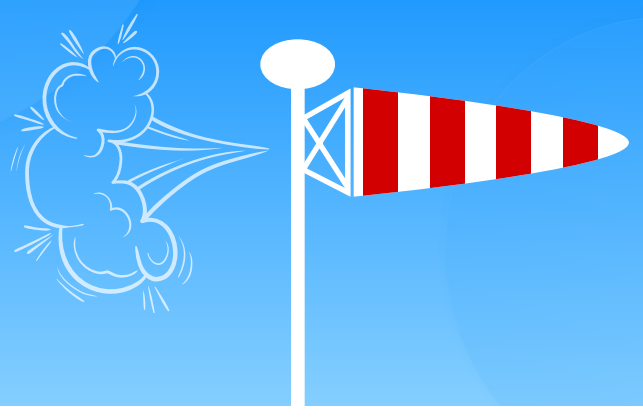
Energy in the wind



Our main sources of energy today are fossil fuels. They formed millions of years ago from dead plants and animals. There are three main types of fossil fuels: coal, oil, and natural gas. All fossil fuels are non-renewable resources. It took millions of years to form fossil fuels and we are currently using it up faster than it is being made. To remove fossil fuel energy from Earth, companies have to drill, mine or frack (break) the Earth. Next, they have to refine (make ready) the energy so that we can use it in our cars, homes and more. A challenge to using non-renewable energy sources is that they can cause pollution of our land, air, and water. Burning fossil fuels throughout the world releases millions of tons of carbon dioxide ($C0_2$) into the air and this causes global warming.

Renewable energy comes from natural resources that can be more easily replenished. Wind, which we will never run out of, is a renewable source of energy. William Kamkwamba, from Malawi, when he was 14, built an electricity-producing windmill from spare parts and scrap. Working from rough plans he found in a library book by McGraw-Hill Education's called Using Energy and then modifying them to fit his needs. The windmill he built powers four lights and two radios in his family home.

Context

Wind is air in motion. Just as a fan moves air, the earth has a natural movement of air in the atmosphere. Have you ever felt a really strong wind? Wind can work for us by moving things around. **Wind power** is low carbon, plentiful and it will never run out, making it an important and reliable energy source.

Have you ever thought...

How is the wind formed?

What do we use wind for?

What are the advantages and disadvantages to wind power?

Have a look

Watch the **video** to understand what William achieved

"The boy who harnessed the wind"

Play Video

Investigate...

Find out about wind turbines and windmills

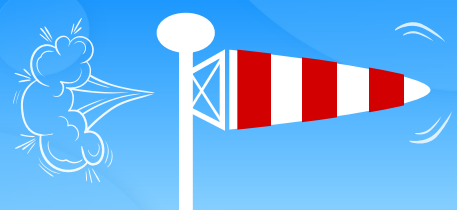
How do they work?

Are there any differences between the two?

Extension

William Kamkwamba built his wind turbine from scraps. People who live off grid with no mains power often use wind power to generate electricity. Find out what wind turbines cost to build.

How much money do they save?



Explore

Design a wind turbine or windmill.

What will you use as wind?

What resources will you use?

Challenge

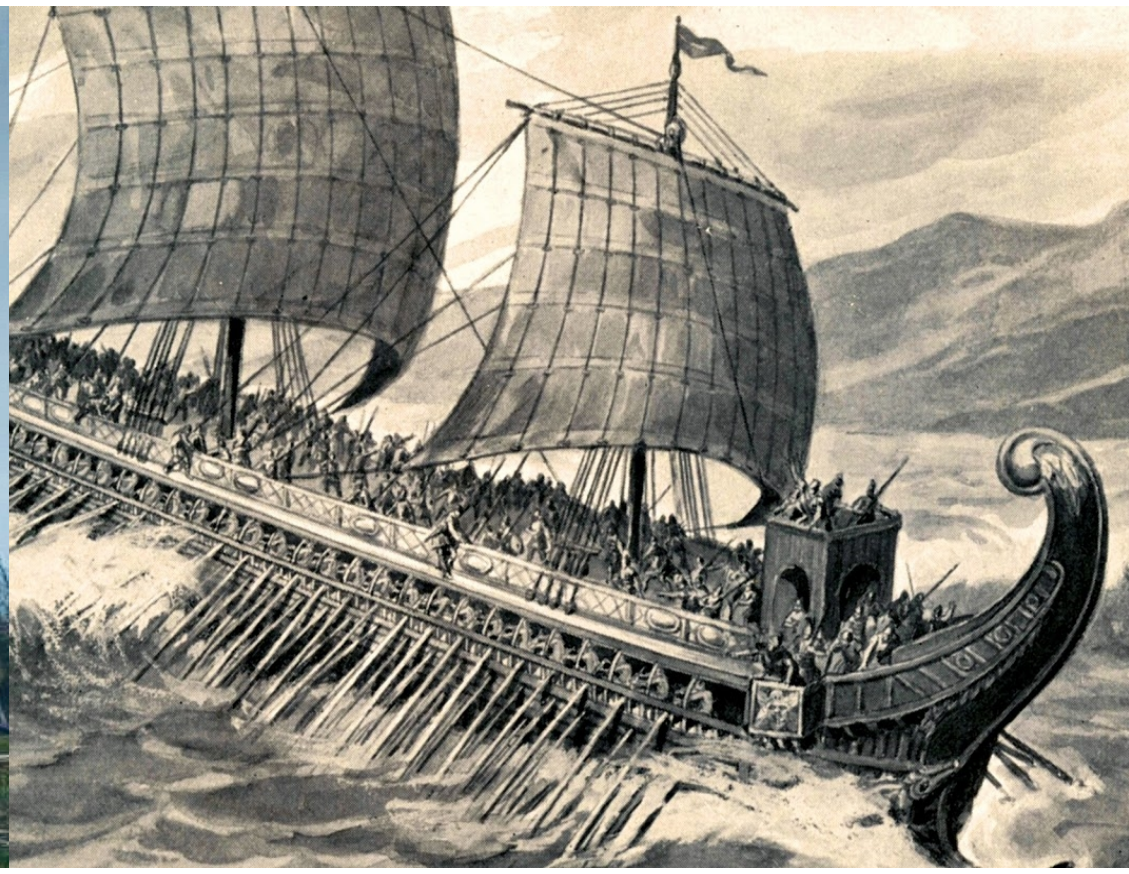
Make a wind powered machine that can lift a weighted cup off the ground

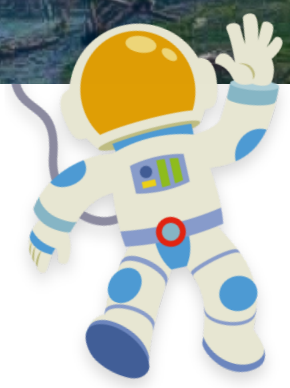
[Practicalaction.org - Wind Power challenge]

Here are materials to reinforce a lesson on renewable energy, focusing on wind power. Students then explore how life for people in the rural mountainous regions of Peru is different as they live without access to mains electricity. They learn how small scale wind turbines have changed people's lives, as with a supply of electricity people are able to light their homes, their school and run small businesses.

Did you know?

This may BLOW your mind!
Wind power is not new. Windmills have been in use since 2000 BC. Ancient mariners used wind power to sail to different lands. You can even find windmills in the game of thrones.





The mathematics

The students through investigation and exploration will be problem solving, conjecturing and applying mathematical thinking. Knowledge and application of measures concepts will be deepened.