

RSC



**THE BOY WHO
HARNESSED
THE WIND**
A **NEW** MUSICAL



SCIENCE & TECHNOLOGY
EDUCATION RESOURCE



A LIFE WITHOUT ELECTRICITY

William's family live in a home without mains electricity. Batteries are used to power things like radios but they are expensive. Kerosene lamps can provide light but the fuel, like batteries, is very expensive.

ACTIVITY - GROUP DISCUSSION ABOUT HOW DEPENDENT THEY ARE ON ELECTRICITY

In groups, discuss what the challenges of not having access to electrical power would be. Think about the different implications: short-term, such as a power cut, and long-term, such as living in a community without mains electricity.

- What would you do for lighting and heating?
- How would you keep food ingredients fresh and how would you cook meals?
- What would be the challenges of keeping in touch with friends and family?
- How would you keep yourself entertained?
- How does not having electricity affect how people work and the types of jobs they can do?

ACTIVITY - ALTERNATIVE WAYS TO HAVE "POWER"

William builds a wind turbine out of scrapyards junk. This generates electricity to power lights and a water pump. Wind turbines are an example of renewable and sustainable energy.

- What are the different types of renewable/sustainable energy that could be used in your homes and communities? How is this different for people living in rural Malawian communities?
- For each method of producing electricity, consider the pros and cons of each method:
 - What are the advantages and disadvantages of using wind energy to produce electricity?
 - What are the advantages and disadvantages of using solar panels for power?

The events shown took place in the early 2000s, before mobile phones and before the internet was widely available.

- Comparing the early 2000s with now, what are the different consequences of being without electricity?





CHALLENGE - BUILDING A WIND TURBINE

Can you follow in William's footsteps and build a [model] working wind turbine?

William had to learn about how wind turbines produce electricity. You will need to research the physics involved in generating electricity. It will be helpful to understand the following terms:

Electromagnetic induction - Generating an electric current with a magnetic field

Dynamo - A device that converts movement into electricity typically by spinning coils of copper in a magnetic field (a bicycle dynamo spins a magnet inside a stationary coil)

Motor - A device that converts electrical energy into movement

Generator - A device that converts mechanical energy into electrical energy

AC & DC - Alternating Current & Direct Current

Rectifier - An electronic device that converts AC into DC

YOU WILL NEED:

- A dynamo or small DC motor (If you use an AC generator then you will also need a bridge rectifier)
- Materials to make sails, a tower and housing for the dynamo/motor
- Wires to connect everything

It may also be useful to have access to a multimeter to see how well your turbine is producing electricity.

There are lots of resources on the internet to provide information and inspiration. Search for videos on how wind turbines work and building model wind turbines.