



MANZI'S NEWS



A Newsletter for Manzi's Buddies

May 2018

ENERGY

Hi Friends,

I really hope that after your first term break you are ready to tackle the coming months until the mid year break. To help you guys with some of the things you will be learning about in your school career, I have decided to help you unpack the concept of Energy.

Let us start by defining the word ENERGY:

**Energy is the ability to do work, to make things happen and to cause changes.
Energy cannot be made or destroyed;
it can only be changed into different forms.**

Credit: teachengineering.org

Has the thought ever crossed your mind about where the power in your light switch comes from? Or maybe how a wind pump is able to pump water?

Well, I have a very enquiring mind, and always look at something and wonder how it works. I read up on ENERGY and discovered some very interesting facts.

Did you know that you get renewable and non-renewable sources of energy?



Have a look at the table below to discover more about these sources of energy:

Source of Energy	Definition	Examples	Advantages	Disadvantages
Renewable	Renewable energy comes from sources that naturally renew, or will not run out in our life time.	Solar energy (energy from the sun). Wind energy (energy from the wind). Hydroelectric energy (energy from moving water). Biomass (organic matter made up of plants). Geothermal (energy from within the Earth).	<ol style="list-style-type: none"> 1. Photovoltaic (PV) cells last for about 20 years. 2. Wind energy can be very efficient and can provide cheap, reliable electricity. 3. Wind turbines do not burn fuel or emit any pollutants into the air. 4. Clean energy. 	<ol style="list-style-type: none"> 1. It can be expensive to install PV cells or build a building that uses the sun for heating and natural light. 2. The sun does not always shine. 3. The wind does not always blow.
Non - Renewable	Non-renewable energy comes from sources that will run out or will not be replenished for thousands or millions of years.	Fossil Fuels such as: <ul style="list-style-type: none"> - coal, - petroleum, - natural gas. 	<ol style="list-style-type: none"> 1. Fossil fuels are a valuable source of energy. 2. Fossil fuels are relatively inexpensive to take out. 3. Fossil fuels can be stored, or moved quite easily. 	<ol style="list-style-type: none"> 1. Fossil fuels take a long time to form. 2. Burning fossil fuels harms the environment as it causes different types of pollution. 3. Burning fossil fuels releases carbon dioxide into the air and too much of this can lead to a rise in temperature.

Adapted from: www.nationalgeographic.org



When it comes to energy, there are different forms, two of which are **Potential** and **Kinetic** energy.

Potential energy is stored energy that can be used. Examples of items with potential (stored) energy include magnets, a stretched elastic band or even food.

Anything that can move on the other hand possesses **kinetic energy**. For example, moving air, a moving part of a machine or moving water has kinetic energy.

Because my passion is water, let us investigate a bit more about moving water!

Hydro power is clean power created from the kinetic energy of moving water. It was once the main source of power around the world throughout history and in many places water wheels can still be seen next to rivers. Hydro energy and hydroelectric power generation depends on the physics of falling water. Moving water (kinetic energy) falls onto the water wheel and the water wheel spins (mechanical energy). This then drives a generator which is the electrical energy.

In South Africa, there is a well known hydroelectric power station that is part of the Thukela-Vaal Water Transfer Scheme. This scheme is found in the Drakensberg Mountains. The Thukela River starts at Mont Aux Sources and naturally flows through KwaZulu-Natal into the Indian Ocean. With the construction of the scheme a certain amount of water from the Thukela River is transferred via canals, pipelines and dams into the Vaal River system.



The Thukela River flows into the Woodstock Dam and then into the Driel Barrage further downstream. A certain amount of water is pumped from the Driel Barrage into a canal which then flows via gravity into the Kilburn Dam. Water from the Kilburn Dam is then pumped underground, over the Drakensberg and into the Driekloof Dam. At peak periods (morning & afternoon) when electricity is needed, water is dropped from the Driekloof Dam, through the underground hydroelectric turbines, and into the Kilburn Dam. This power station, the Drakensberg Pumped Storage Scheme, is managed by Eskom and electricity that is produced here is fed into the national electricity grid and used in South Africa.

Do you know what is the biggest source of energy used by our planet?
THE SUN

To understand what a water wheel is, and how it works, let us make one by following the steps in the activity below.

ACTIVITY: Making a Water Wheel (NB: Please ask your parents to help with sharp items)

What equipment is needed?

1. 2 x 440ml cool drink bottles.
2. Permanent Marker.
3. Scissors.
4. Electrical tape.
5. Small precision screw driver.
6. 2 small elastic bands.
7. 1 x 25cm sosatie stick.
8. 4 x 15cm sosatie sticks.
9. 4 x milk bottle caps.
10. 1 litre measuring jug.
11. Bucket with water.

STEP 3:

Unscrew the bottle caps and make a hole in each cap, using the screw driver, big enough for the 25cm sosatie stick to fit through.



STEP 1:

Using the marker, draw a line around the middle of each 440ml bottle. Cut both bottles in half and place the bottom halves one side.



STEP 4:

Place the bottle caps back onto the bottle tops and place the sosatie stick through the holes. Put a rubber band on each end of the sosatie stick.



STEP 2:

Tape the two top halves of the 440ml bottles together using the electrical tape.



STEP 5:

Using the small screw driver, make 4 small holes in the middle of the joined bottles and place the 4 15cm sosatie sticks in the holes.



STEP 6:

Using the electrical tape, tape a milk bottle cap to each of the 15cm sosatie sticks. Make sure that the bottle caps are all facing the same direction.



STEP 7:

Take the water wheel and hold it by one end of the sosatie stick as shown. Hold it over a bucket and pour Water onto the bottle caps using the jug. As you continue to pour the water, your water wheel will turn around and around.



I hope that you have enjoyed learning about energy, and how water can be a useful way to make electricity from the kinetic energy it possesses when it moves. All the more reason for us to respect and conserve this valuable resource.

Remember, Water is Life! We need it to survive, in more ways than one!

Till next time... Your Friend, MANZI