

Answers to Activity Sheets

Sheet 1 - What do we use electricity for?

Lamp - Heat and Light

Iron - Heat

MP3 Player - Sound (light on display?)

Washing Machine - Heat, Movement (Sound as by-product)

TV - Light, Sound (Heat as by-product)

Hairdryer - Heat, Movement (Sound as by-product)

Laptop - Light, Sound (Heat as by-product)

Torch - Light (Heat as by-product)

Vacuum Cleaner - Movement (Heat and Sound as by-products)

Sheet 2 - What is Energy

Energy is the ability to do **WORK** . It comes in many different **FORMS** .

These are heat, light, mechanical, electrical, nuclear and kinetic (movement) energy.

We use energy in everything we do, from jumping to watching television.

There are two main sources for the energy we use every day:

- Energy that is made using natural resources that can be replaced, like wind, water and sunshine, is called **RENEWABLE** energy. This is also called 'clean energy' or 'green power' because it does not pollute the air or water.
- Non-renewable energy sources are those that cannot be replaced once they are used, such as the **FOSSIL** fuels oil, natural gas and coal. Most of our electrical energy comes from burning non-renewable energy sources. Non-renewable energy sources also cause pollution.

Renewable and non-renewable energy sources can both be used to produce **ELECTRICITY**.

Sheet 3 - How long will fossil fuels last?

Oil and Gas will be depleted by the time the pupils are 50 (at current known reserves and rate of use) The other answers will depend on the pupils opinions but may include -

- no gas and oil for producing electricity - reliance on other resources
- no oil to produce petrol, plastics, chemicals, drugs etc
- Replace use of fossil fuels with alternatives (e.g. biofuels, hydrogen or electricity for cars)
- Conserve supplies by using less energy

Sheet 4 - How much energy do we use?

Results and explanations will vary from pupil to pupil.

Cost per unit can be found from an electricity bill or on most electricity companies' websites.

Variations may occur due to number of people at home, weather, occasional use of high power device etc.

Sheet 5 - Electricity travels!

The correct order is:

1. Firstly coal, gas and nuclear power stations make most of the electricity we need. The rest comes from wind farms and other types of power station.
2. All of these power stations work together to generate and supply enough electricity for the UK.
3. The electricity from all the power stations goes into a system of power lines called the National Grid.
4. The National Grid supplies mains electricity to our homes.
5. In our homes a meter measures the amount of electricity we use and this is used to work out how much we have to pay.
6. The mains electricity supply passes through fuses in our homes to prevent electrical accidents.
7. Finally the sockets in our houses are connected by wires to the mains supply so that we can plug in the TV and other electrical items.

Sheet 6 - Supply and Demand

The winter bill is invariably higher due to use of extra heating and lighting in winter - also often more cooking of hot food etc.

Sheet 8 - How a Turbine Works

Description	Name
The large tall structure which holds up the wind turbine	TOWER
These turn in the wind - there are three of them!	BLADES
This word means "turn" and describes how the nacelle and blades turn to get the best from the wind	YAW
This word describes how each blade changes shape in the wind	PITCH
This connects the rotor to the gearbox	SHAFT
This machine contains a magnet spinning inside a wire coil to generate electricity	GENERATOR

This measures wind speed and sends the information to the control room	ANEMOMETER
These are wires which carry the electricity from the turbine	CABLES
This is a pod which contains all the working parts of the turbine	NACELLE
The three blades are attached to this and it moves round and round	ROTOR
This stops turbine towers from falling over!	FOUNDATIONS

Sheet 9 - From the Wind Farm to our Homes

The correct order is:

1. Firstly, the electricity is generated at a power station.
2. This power station is called a wind farm.
3. The wind spins the wind turbines' blades.
4. The blades spin a generator.
5. Inside the generator, a magnet spins inside a coil of wire to generate electricity.
6. The electricity flows away from the wind farm along thick wires (cables).
7. Cables carry electricity to a transformer which changes the low voltage electricity to high voltage electricity to make it travel better over long distances.
8. High voltage electricity flows from pylon to pylon across the countryside.
9. In substations, the high voltage electricity is changed back to low voltage electricity because we can't use high voltage electricity in our homes.
10. Lastly, cables carry the electricity from the substation to our homes.

Sheet 10 - 18

Some of these sheets are information sheets, some describe experiments the pupils can perform and on other the answers will vary from pupil to pupil.