

Grade 5 Natural Sciences and Technology Revision.

Topics that need to be studied for the test:

1. Stored energy in fuels (Pg 111)

- Fuels (Pg 112)
- Burning Fuels (Pg 118)
- Safety with fire (Pg 124)

2. Energy and Electricity (Pg 127)

- Cells and Batteries (Pg 128)
- Mains Electricity (Pg 132)
- Safety with electricity (Pg 138)

The test will be out of 50 marks and will include true and false questions, column A and B, short answer questions and longer questions where you will have to explain concepts and justify your response. Make sure to study all the keywords.



Stored energy in fuels.

People and animals get their energy from the food that they eat. This food has stored energy inside of it. This includes fruits, vegetables and meat. When we eat this food, the energy that was stored inside of it goes into our bodies so that it can be used when we do things like walk, run, breathe, talk, etc.

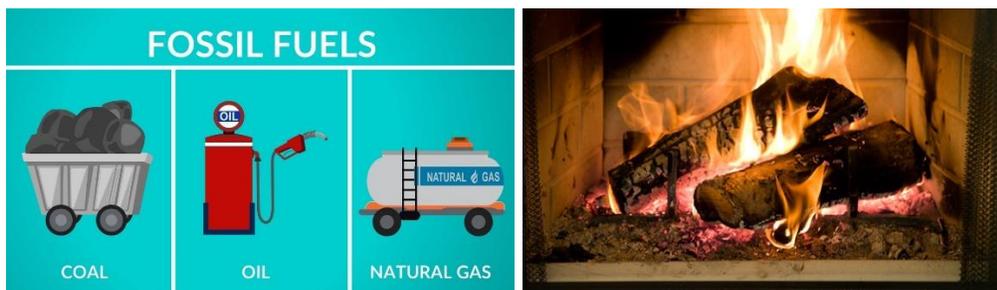
Plants get their energy from the sun through a process called photosynthesis. This energy gets stored in their roots, leaves, stems and fruit. (Grade 4).

This food is considered to be a “Fuel” for our bodies because without it we would not be able to do anything. There are many other types of fuels that we get.

But firstly, What is a “Fuel”? – **“a substance that can be eaten or burned to produce energy.”**

When we want to produce energy like movement, electrical energy, heat or light, we use fuels.

Some examples are: Wood, coal, paraffin, candle wax, natural gas and petrol.



We can use these fuels for many things such as heating our homes, cooking, lighting up a room or even making cars move.

These fuels need input energy to make them burn. Once they are burning they produce output energy that is useful to us.

For example: For a wooden log to burn we need to bring it in contact with a flame. The fire is the input energy. Once this log starts to burn it produces two types of output energy that we can use: heat energy and light energy.

Another example: when we need to burn paraffin in a lamp, we need to light a match stick and bring the flame into contact with the paraffin and it will start to burn. The output energy produced is light energy and a little bit of heat energy.

In both of these examples, heat is our input energy to make the fuels burn. If we want these fuels to keep burning we need a continuous supply of oxygen. This is a gas found in the air around us. If we cut off the supply of oxygen or the fuel runs out then it will no longer burn and produce the output energy. Firefighters are people that have been trained to put out (extinguish) uncontrolled fires. We still need to do our best to prevent fires and ensure we practice safety with fire.

Energy and Electricity:

Electricity is a type of energy. We can also call it “electrical energy”. When we use electrical appliances, electricity is considered to be the input energy. This means that we need to put electrical energy into these appliances to make them work. The electrical energy is then converted into either, light, heat, sound or movement energy.



Electrical energy can be stored in cells and batteries and used to power up TV remotes, electric toy cars, cell phones, etc. Electricity can also come from a power station. This is called “mains electricity”. Electricity is generated at a coal burning power station and it travels, through power cables/transmission lines, to a substation, where the amount of electricity is changed.

- A transformer is used to either increase the amount of electricity so that it can travel over long distances OR it will decrease the amount of electricity so that it is safe to use in our homes.

From the substation, the electricity is carried through power lines/transmission lines which are supported by pylons, into different places like homes, schools, hospitals, offices etc.

In some electrical appliances we use a switch. This controls the energy in the system. Switches can be turned on or off. When turned on, the electrical energy will be converted to another form of energy within the appliance/device. If turned off, this will not happen. The electrical energy remains stored within the battery or cell.

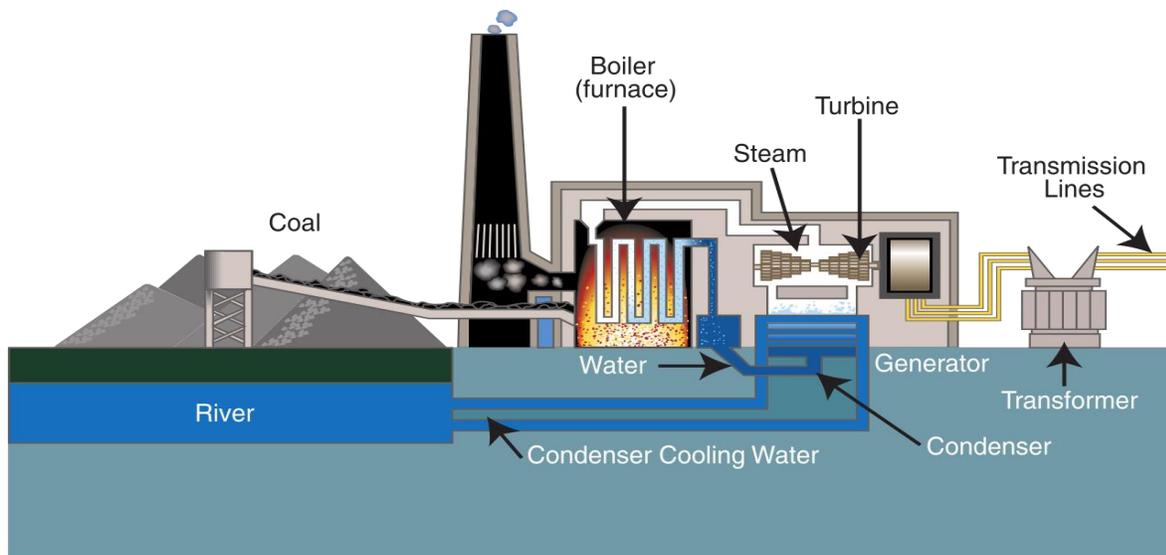
Different appliances convert electricity to different types of energy. For example:

- An electric heater converts electricity into heat energy.
- A washing machine converts electricity into movement energy
- A radio converts electricity into sound energy.
- A torch converts electrical energy into light energy.

In South Africa, most of our power stations burn coal as a source of energy. This is because coal has a lot of stored energy. It comes from plants and trees that died millions of years ago. These plants had energy stored inside of them from the sun. They were then covered by soil and rocks. Due to pressure and heat from the earth, these plants and trees turned into fossils and that is how we get coal. Coal burns for much longer than wood or paraffin and also much hotter. It is also easier to use coal in a power station.

What is the coal used for?

- Coal is mined from the ground and sent to a power station.
- At the power station, the coal is burned inside of a furnace.
- This coal is then used to boil water.
- When water boils, it turns into steam.
- This steam is channelled into a generator.
- Inside the generator, there is something called a turbine.
- Because of all the pressure from the steam, the turbine spins at very high speeds.
- When this happens it created an electrical charge.
- This is how electricity is generated.



Coal is regarded as a non-renewable resource because it takes millions of years to form under the ground and once we use it all up, we will not have any more. There are other ways of generating electricity. Nuclear power is one of these ways, but it can be very costly to build and maintain these power plants, and also quite dangerous if something goes wrong. Renewable energy sources include:

1. Solar energy
2. Wind energy
3. Hydro-electric energy

When dealing with electricity, we have to take caution. Electricity can be very dangerous if we are not careful with how we use it. You can read all about safety with electricity on Page 138 and 139 of your textbook.