ROCKS AND SOILS

Rock can be hard, soft, permeable or impermeable, depending on what type of rock it is. Slate, marble, chalk and granite all have different uses.

Different plants grow better in different types of soil.

Characteristics of rocks

Some rocks are harder than others. For example, granite is a very **hard** rock, but some sandstones are much softer rocks and wear away easily.

Some rocks, such as some types of sandstone, let water soak through them. They are called **permeable** rocks.

Other rocks, such as marble and slate, do not let water soak through them. They are called **impermeable** rocks.

Uses of rocks

Slate

Because slate is a hard, impermeable rock, which splits easily into thin sheets, it is ideal for making roofing tiles.

Limestone

Limestone is a rock that is formed mostly from the hard parts of many sea creatures. It wears easily when it comes into contact with water and it is in this type of rock that many caves form.

ROCKS AND SOILS

Marble
Marble has an attractive texture and colour and can be cut and polished. Because of this, it is used to make floor tiles and wall tiles. Some statues are made from marble too.

Granite
Granite is a coarse-grained rock that is hard and impermeable. It is often used to make steps and roads as it is a rock that doesn't wear away easily.

Titanic Memorial, Belfast; the statues are carved from marble that stands on a granite plinth.

Soils
Soils are a mixture of tiny particles of rock, dead plants and animals, air and water.
Different plants grow better in different types of soil.

Sandy soil is pale coloured with lots of small air gaps. Water drains through sandy soil easily so it usually feels quite dry.

Clay soil is an orange or blue-ish sticky soil with very few air gaps. Water does not drain through it easily. When it rains, puddles stay on top of clay soil for a long time.

Chalky soil is a light brown soil. Water drains through it quickly.

Peat is actually not a soil at all and does not contain any rock particles. It is made from very old, decayed plants and is dark, crumbly and rich in nutrients.

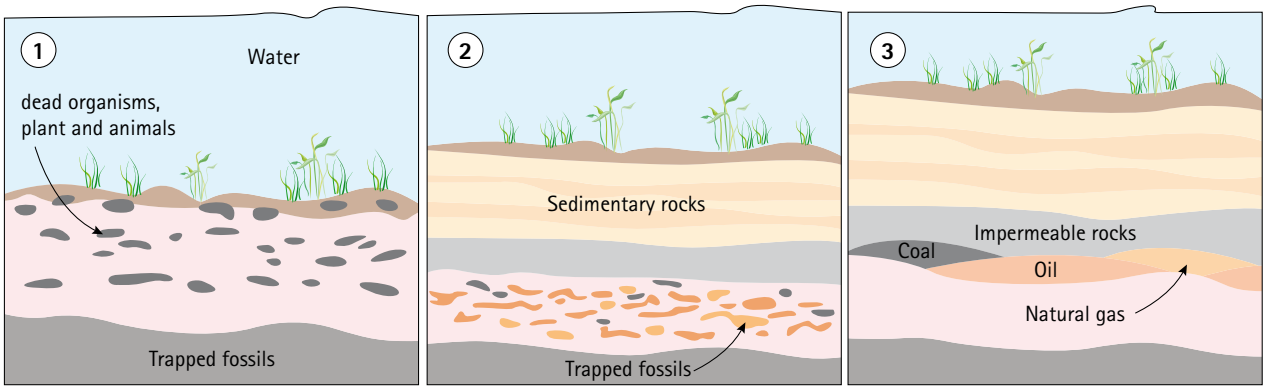
NON-RENEWABLE ENERGY

What is non-renewable energy?

Energy exists freely in nature. Some exist infinitely (never run our, called RENEWABLE), the rest have finite amounts (they took millions of years to form, and will run out one day, called NON-RENEWABLE).

Non-renewable energy is energy from fossil fuels (coal, crude oil, natural gas) and uranium. Fossil fuels are mainly made up of Carbon. It is believed that fossil fuels were formed over 300 million years ago, when the earth was a lot different in its landscape. It had swampy forests and very shallow seas. This time is referred to as 'Carboniferous Period'.

Fossil fuels are usually found in one location as their formation is from similar process. Let us take a look as the diagram below to see how fossil fuels are formed:



1. Millions of years ago, dead sea organisms, plants and animals settled on the ocean floor and in the porous rocks. These organic matter had stored energy in them as they used the sun's energy to prepare foods (proteins) for themselves (photosynthesis).
2. With time, sand, sediment and impermeable rock settled on the organic matter, trapping its' energy with the porous rocks. That formed pockets of coal, oil and natural gas.
3. Earth movements and rock shifts creates spaces that force to collect these energy types into well-defined areas. With the help of technology, engineers are able to drill down into the sea bed to tap the stored energy, which we commonly know as crude oil.

ENERGY — WHERE DOES OUR ENERGY COME FROM?

Where does our energy come from for...?

- Electric light
- Mobile phones
- Power for your mp3 player
- TV
- Hot water

Energy for these things come from energy resources that are converted into energy that we can easily use.

Electricity is the main form of energy that we use and can power or charge what we need energy for.

Energy resources can be divided into two categories:

1. Non-renewable resources
   For example – coal, oil, gas, uranium or lignite.
   Once used these resources CANNOT be used again.

2. Renewable resources
   For example – wind, water or solar.
   These resources can be used over and over again.

Renewable resource: WIND

What is it?

- It is the movement of air.

How much left in the world?

- Endless.

Advantages?

- No pollution.

Disadvantages?

- Winds change all the time, it is not predictable.

ENERGY — WHERE DOES OUR ENERGY COME FROM?

Renewable resource: SOLAR

What is it?

- Energy from the sun.

How much left in the world?

- Endless.

Advantages?

- No pollution; it can be used in remote areas.

Disadvantages?

- Can be expensive; it, needs sunlight.
- At night it doesn't work!

Renewable resource: NATURAL GAS

What is it?

- Formed underground from decaying animal and plant material.

How much left in the world?

- About 60 years.

Advantages?

- Clean, least polluting of all non-renewables.
- Easy to transport.

Disadvantages?

- Some air pollution.
- Danger of explosions.

ENERGY — WHERE DOES OUR ENERGY COME FROM?

Renewable resource: BIO-ENERGY

What is it?

- Biomass and Biogas.
- Fermented animal or plant waste.
- Vegetation from sustainable sources.

How much left in the world?

- Endless.

Advantages?

- Good availability.

Disadvantages?

- Can be expensive to set up.

Renewable resource: HYDRO

What is it?

- Movement of water drives a turbine.

How much left in the world?

- Endless.

Advantages?

- No carbon dioxide emissions; it can control flooding and provide a good water supply to an area.

Disadvantages?

- Large areas may need to be flooded to form reservoirs. Visual and water pollution.

ENERGY — WHERE DOES OUR ENERGY COME FROM?

Renewable resource: GEOTHERMAL

What is it?

- Heat from the ground — often used to heat water.

How much left in the world?

- A lot.

Advantages?

- No carbon dioxide emissions.

Disadvantages?

- Expensive and can only be used in certain parts of the world.

Renewable resources: WATER and TIDAL

What is it?

- Movement of sea drives turbines.

How much left in the world?

- Endless.

Advantages?

- Can produce a lot of electricity; it produces no carbon dioxide emissions.

Disadvantages?

- Not many suitable sites.

Where does our energy come from?

- From renewable and non-renewable energy sources.
- Renewable energy sources are now increasingly being used.
- Renewable energy: the future of energy, today!