

# IS THE EARTH RUNNING OUT OF NATURAL RESOURCES?

YEAR 7

## The Earth's Spheres -

- Atmosphere** – The thin fragile, layer of gases that surrounds earth
- Biosphere** – Living matter on the earth including all plant and animal life
- Hydrosphere** – The water on the earth's surface in oceans, rivers, lakes and mist
- Lithosphere (Geosphere)** – The earth's crust including landforms, rocks and soil.
- Cryosphere** - Earth's surface that is frozen for some of the year. It includes snow, permanently frozen ground, glaciers, ice caps, ice sheets and sea ice.



## Weathering

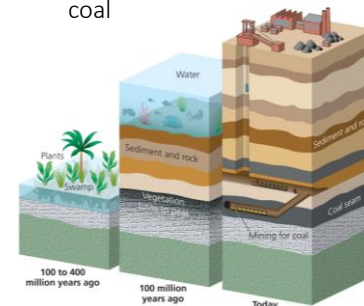
Weathering is when rocks are broken down. There are 3 types of weathering:

- Mechanical (physical)** – When rocks break up due to water entering the cracks and freezing and thawing, making the rock weak.
- Chemical** – Caused by chemical changes. Slightly acidic rainwater slowly dissolves certain rock types
- Biological** – Plant roots grow causing cracks in the rocks and animals burrow into weak rocks like sand.



## How was Coal formed?

1. Plant matter fell to the bottom of the swamp and began to decay
2. The levels of decaying matter built up
3. The plant matter became peat
4. The weight of the water compacted the peat
5. Under heat and pressure oxygen was forced out of the peat
6. Plants gradually turned to coal



## Rock Type-

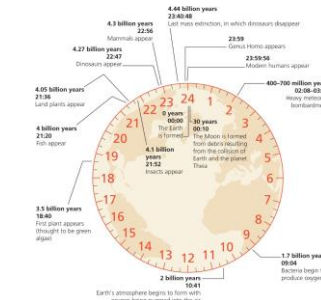
**Igneous:** This is formed from molten rock often linked to volcanoes. The molten rock may cool slowly. Igneous rocks are very hard.  
EG: Granite

**Sedimentary:** Most of these types of rocks are formed under the sea. On the sea bed they were buried by newer sediment, squeezed and cemented together over thousands of years to form new rock.  
EG: Chalk

**Metamorphic:** Existing rocks that are transformed by great heat or pressure. These changes lead to the existing minerals melting and forming new minerals. Eg: Marble

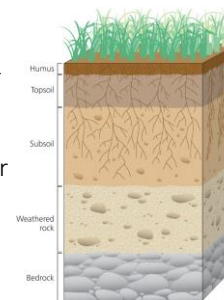
## Geological Timeline –

Geologists have created a geological timescale to explain how the planet evolved, which is divided into blocks of time. All geologists in the world work with the same timescale, so that different geological features and rock layers can be compared around the world



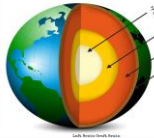
## Soil Profile:

- Humus** - This layer is 5-20cm thick. It consists of organic matter and minerals.
- Topsoil** - This is a layer of organic matter that is about 2-3cm thick and is made up of dead plant matter such as leaves.
- Subsoil** - This layer has minerals as well as organic matter which have been washed down by rainwater. Tree roots can reach into this section.
- Weathered Rock** - This layer contains rock from the lowest layer, weathered and broken into chunks. The upper soil layers have developed from this.
- Bedrock** - This layer is made of soil mass of underlying rock.



## Plate Tectonics

The crust is the solid rocky outer layer- broken in to rafts of solid rock that 'float' on the mantle. The pieces are called **tectonic plates**  
The mantle is 'plastic' and can flow very slowly  
The outer core is liquid  
The inner core is solid



## How is Oil formed?

Oil and gas were formed from the remains of animals and plants that lived millions of years ago in the sea. These remains were covered by layers of sand and silt. Heat and pressure from the Earth's core turned them into oil and gas. The oil and gas were trapped between layers of rocks.



## Ecosystem –

An ecosystem is an interconnected community of all of the living things and all of the non-living parts of the environment (e.g. soil, water and air) that they require to survive. We use the rainforest in the following ways:

- Timber
- Make up
- Medicine
- Food
- Emergent
- Canopy
- Under canopy
- Shrub



## Food Web–

- Producer** – plants which produce energy by photosynthesis
- Primary Consumer** - animals which gain energy from eating producers
- Secondary Consumer**- animals which gain energy from eating primary producers

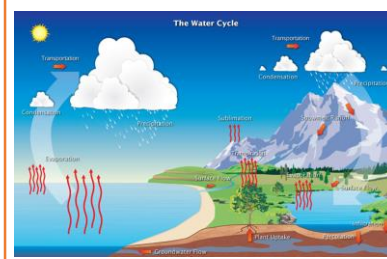


## How can we use natural resources sustainably? –

- Local** – by individuals, schools and communities, for example recycling resources
- National** – the UK Government offers incentives to companies and people to use renewable energy sources.
- International** – organisations like the United Nations are working with countries to encourage them to work together to tackle global issues.

## Water –

Water helps the earth connect all its spheres. It is continuously flowing between the ocean, atmosphere and land, powered by the Sun, through the water cycle.



## How do we use water?

- Industry (business)
- Agriculture (farming)
- Personal

**Method to reduce water consumption**



- Use a water meter (this charges people based on how much water they use rather than a 'flat' rate)
- Increase the use of grey water (any domestic wastewater produced, excluding sewage – it could be used for things like watering the garden)
- More efficient domestic appliances e.g. dishwashers
- Rainwater harvesting - Captures rainwater from a roof and stores it in a large container for use at schools.
- Build wells through digging or drilling
- Protecting natural springs –Directing the spring to flow through a pipe to protect it.

**Renewable energy:**



- Energy that can be re-made
- Solar Panels – Used to convert the sunlight to energy
  - Wind turbines – A generator converts wind into energy
  - Geothermal – uses underground heat to create steam which turns a generator
  - Biomass – Burning plants and animal waste.
  - Hydroelectricity – Uses water to turn turbines.

Advantages
<ul style="list-style-type: none"> <li>• Creates little pollution</li> <li>• Renewable energy will not run out</li> <li>• Low maintenance requirements</li> <li>• Often looks better than an energy plant</li> </ul>

Disadvantages
<ul style="list-style-type: none"> <li>• High cost to install initially</li> <li>• Not always available</li> </ul> <p>EG: if not sunny, solar panels will not be able to collect water.</p> <ul style="list-style-type: none"> <li>• Not available everywhere in the world.</li> </ul>

**Resources we need to survive –**

- Air – to breathe
- Clean Water – to drink
- Fertile soil – to grow crops
- Wood and rocks – to build
- Animals – to eat

**How can we use natural resources sustainably? –**

Actions to improve sustainability can operate at a number of levels.

- Local – by individuals, schools and communities, for example recycling resources as part of waste disposal or saving energy by using low-energy lightbulbs.
- National – the UK Government has begun to encourage sustainable use of energy by offering incentives to companies and people to use renewable energy sources.
- International – organisations like the United Nations are working with countries to encourage them to work together to tackle global issues. You will investigate actions at this scale in future units.



**Fossil Fuels-**

Advantages
<ul style="list-style-type: none"> <li>• They generate large amounts of energy quite cheaply.</li> <li>• As technology improves, more reserves can be accessed.</li> <li>• Locating where fossil fuels are is quite easy.</li> <li>• Oil and gas can be transported through pipelines.</li> <li>• The means for extracting fossil fuels is already in existence.</li> </ul>

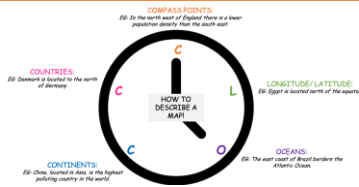
Disadvantages
<ul style="list-style-type: none"> <li>• They release carbon dioxide when they are burnt, creating pollution.</li> <li>• Mining can create ugly scars on the landscape.</li> <li>• Mining can be dangerous.</li> <li>• Oil spills can cause environmental damage.</li> <li>• Supplies are running out and new sources are harder to get to. Oil and gas are both predicted to run out within 100 years.</li> </ul>



**Describe the Distribution...**

- Compass points
- Longitude/ Latitude
- Oceans
- Continents
- Countries

When asked to describe the distribution use CLOCC. As a minimum use place names and compass points.



**Key Words-**

*Natural Resources* – Materials found in nature that we need in order to survive  
*Renewable energy* - Replaced by the natural processes of the Earth's spheres, which take place in less time than an average human life  
*Non-renewable energy* - Some resources take millions of years to be replaced naturally. Within a human's lifetime these resources would seem like they are never replaced.  
*Fossils* - Remains or traces of ancient life that have been preserved by natural processes  
*Weathering* - When rocks are broken down. There are 3 types of weathering; mechanical, chemical and biological  
*Soil* - A thin layer on the Earth's surface between the lithosphere and biosphere. It is a layer of minerals, water and organic matter that forms from the weathered rock below, and decaying vegetation above.  
*Ecosystem* - interconnected community of all of the living things and all of the non-living parts  
*Sustainable* - The ability to meet the needs of the current population without stopping future populations to meet their own needs.

**Command Words:**

- Analyse** - Take apart an idea, concept or statement and criticise it.
- Assess** - Come to a conclusion about the overall value or significance of something; discuss its positive and negative aspects to show balance.
- Compare** - Identify similarities and differences.
- Define** - State the meaning of an idea or concept.
- Describe** - Set out the main characteristics of something; DON'T EXPLAIN.
- Discuss** -Set out both sides of an argument (for and against) and come to a conclusion; there should be some evidence of balance.
- Evaluate** - Make a judgement about the effectiveness of something; discuss its strengths **and** weaknesses and come to a conclusion about its overall success or importance.
- Explain** - Give reasons why something happens.
- Give** - Produce an answer from recall.
- Justify** - Support an idea or argument with evidence; for the outcome chosen, the positives must outweigh the negatives.
- State** = name

**How to revise:**

To revise you should reduce these notes further, use colour and images. You could make a mind map/ poster/ revision cards/notes/ presentation/ song/ answer the following questions.

1. Define weathering
2. Name the 5 types of earths spheres
3. On the diagram to the right, annotate the layers of the earth.
4. State the 5 main natural resources humans need in order to survive,.
5. Is coal a renewable or non-renewable form of energy.
6. Using the picture on the right, describe a soils profile.
7. Describe the water cycle.
8. Explain the formation of coal.
9. Explain how sedimentary rock is formed
10. Identify two natural resources and describe how humans make use of them
11. Assess the importance of using renewable energy sources.
12. Evaluate whether renewable or non-renewable energy sources are more reliable.

