

SCIENCE FORM 1

CHAPTER 4 THE VARIETY OF RESOURCES ON EARTH

Different resources on Earth

- Human beings, animals and plants need food, water, air and shelter in order to survive.
- The Earth has the resources needed to sustain life.
- The resources are air, water, soil, minerals, fossil fuels and living things.

Air

- Air is needed by all living things to survive.
- The atmosphere is a layer of air that envelops the Earth.
- Air is a mixture of gases. Air contains gases such as oxygen, nitrogen and carbon dioxide.
- Oxygen and carbon dioxide are two very important gases that support life on Earth.
 - o Oxygen
 - Used for respiration by living things
 - Used in combustion of materials
 - Used in industries
 - Released during photosynthesis.
 - o Carbon dioxide
 - Used by green plants to carry out photosynthesis
 - Used in fire extinguishers
 - Released during respiration and combustion.

Water

- Water covers a total of about three quarters of the Earth.
- The sources of water are oceans, seas, rivers, lakes, rainfall and ground water.
- Importance of water
 - o To animals/human
 - It provides a medium for chemical process and body metabolism
 - It is the main component of the blood
 - It transports nutrient to all cell in the body
 - It carries excretory products to the kidneys for excretion
 - It helps to control the body temperature.
 - Dissolves minerals salts in the ground for absorption by the root of plants
 - Helps to support aquatic plants
 - Cool down the plant (transpiration)

Soil

- Soil refers to the outer layer of the Earth.
- Soil contains mineral matter, organic matter, air and water.
- The soil organic matter includes
 - Organic litter such as fallen leaves, twigs, fruit, animal dropping etc.
 - humus formed from the composition of organic litter.
 - Microorganism living in the soil.
- Air and water are found in pore spaces between the soil particles.

- The presence of air and water in the soil makes soil a natural habitat for various types of plants and animal.
- Importance of soil
 - Source of minerals and fossil fuel
 - Source of clay for making pottery
 - Source of sand for making glass and cement
 - Base for agricultural activities
 - Foundation for construction of houses, building, road and other structures.

Living things

- Importance of plants and animals
- Flora and fauna (plants and animals) are also natural resources that sustain life.
- Plants and animals are resources needed by human beings.
- We can obtain food, fuel, materials for making clothes and building materials from plants and animals.
- Green plants are able to make their own food by carrying out photosynthesis.
- Animal are not able to make their own food.
- Some animals for example, giraffes and elephants feed on plants.
- Some animals for example, tigers and snakes feed on other animals.
- Aquatic plants and animals are also important resources for sustaining life.

Mineral

- Minerals are inorganic substances found naturally on land and in seas or oceans.
- Examples of minerals are feldspar, quartz, iron, zinc, aluminium, tin, silver and gold.
- Some minerals for example aluminium and iron are mined because they can be used as raw materials in various industries.

Fossil Fuels

- Fossil fuels are formed from the remains of animals and plants that have died millions of years.
- There are three types of fossil fuels; petroleum, coal and natural gas.
- Coal and natural gas can be burnt as fuel directly after they mined.
- Petroleum can be separated into different parts by fractional distillation before use.
- Products of fractional distillation are petrol, diesel, kerosene and liquefied petroleum gas. (LPG).

Element

- Elements are substances that are made up of only one type of particle.
- An element cannot be broken down into any simpler substances by physical or chemical methods.
- Examples of elements are copper, carbon, iron, gold, sulphur and aluminium.
- There are more than 110 elements.
- Element can be grouped into metals and non-metal.

Properties	Metals	Non-metals
Appearance	Shiny	Dull
Hardness	Very hard or hard	Brittle
Malleability	Malleable	Non-malleable
Ductility	Ductile	Non-ductile
Heat conduction	Good conductor	Bad conductor
Conduction of electricity	Good conductor	Bad conductor
State	Solid	Solids, liquid, gases
Density	Higher	Lower

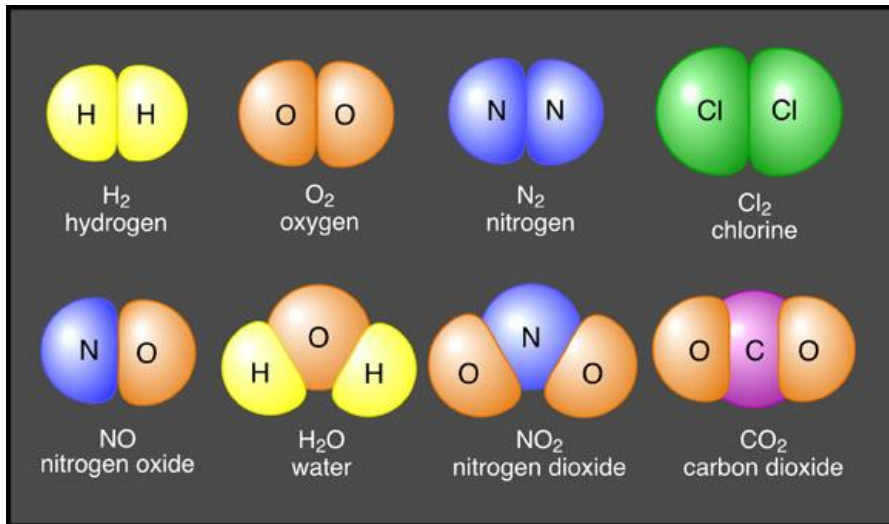
Period	IA (1)	IIA (2)	Transition Metals (Groups IIIA to VIIIA)										IIIA (13)	IVA (14)	VA (15)	VIA (16)	VIIA (17)	VIIIA (18)
1	H																H	He
2	Li	Be											B	C	N	O	F	Ne
3	Na	Mg											Al	Si	P	S	Cl	Ar
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	In	Sn	Sb	Te	I	Xe	
6	Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn

Metals
 Metalloids
 Non-Metals

- Metalloids have properties of both metals and non-metals.
- Some of the metalloids, such as silicon and germanium, are semi-conductors. This means that they can carry an electrical charge under special conditions.
- This property makes metalloids useful in computers and calculators

Compounds

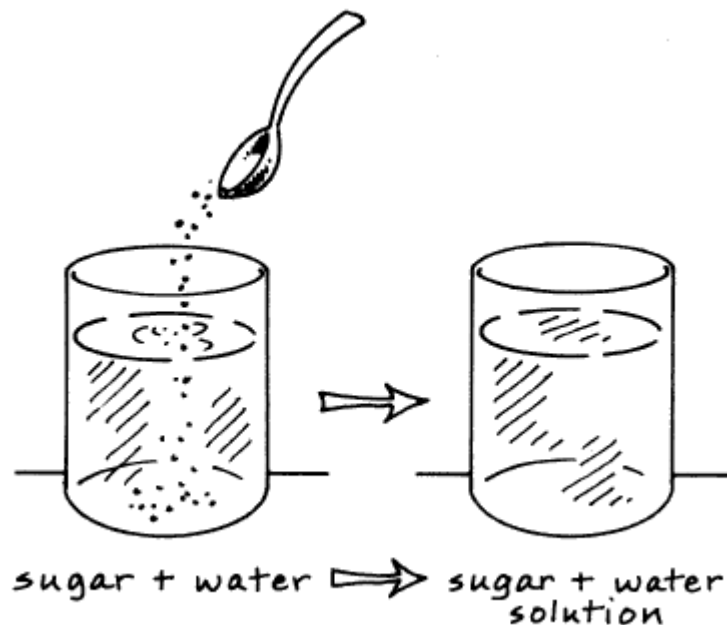
- Compounds are substances that are made up of two or more types of particles.
- These particles combine chemically according to a fixed proportion.
- has properties that are different from its component elements, and always contains the same ratio of its component atoms



- The particles can only be separated by chemical methods such as electrolysis or by using strong heat and cannot be separated by physically methods.
- For example : water made up of one oxygen particle and two hydrogen particles. Water can be broken down into hydrogen gas and oxygen gas by electrolysis.

Mixtures

- Mixtures are substances that are made up of two or more types of particles which combine physically.
- The different types of particles in a mixtures are not chemically combined and they can mix in any proportion.



- The components of a mixture can be separated easily by physical methods such as evaporation and filtration or by the use of magnet.
- Examples : blood, air, soil, coffee etc.

Components of a mixture can be separated by any of these methods.

- Filtration
- Sieving/Sifting
- Evaporation
- Distillation
- Using a magnet
- Precipitation
- Extraction
- Chromatography

Preservation and conservation of resources on Earth

- Preservation means maintaining certain areas of Earth in their natural condition.
- Preservation ensures that we do not lose our natural resources to development such as farming, industry, housing or tourism.
- Examples of efforts in preservation are the setting up of forest reserves, state parks, national parks and marine parks.
- These efforts ensure that the flora and fauna in these protected areas would still be around for the future generations to see.
- Conservation means the sustainable use and management of Earth's resources.
- Conservation also means using Earth's resources wisely and not in wasteful ways.
- Conservation of resources ensures that we maintain sufficient quantities of resources for future generation to use.

The importance of appreciating Earth's resources to human beings

- We can show that we appreciate the importance of Earth's resources by using the resources wisely and not in wasteful ways.
- You may practice reduce, reuse and recycle.
- Reducing means using less resources to ensure that will be there for our future use as well as for the future generations.
- Reusing refers to using discarded or unwanted materials to save on nature's resources.
- Recycling refers to the processing of waste materials to become useful things in order to save Earth's resources.