Suva Sangam College

Year 9 Basic Science Notes

Strand: Living Things and the Environment

Sub Strand: Biodiversity, Change and Sustainability

Week 1 5th – 9th, July , 2021

Achievement Indicators:

- Define the term Biodiversity and its importance

- Identify the impact of habitat destruction on organism.

Biodiversity and its importance

- The varieties of living things in different ecosystems refer to the diversity of life in an area.
- It can also be describe in terms of its genetics composition, species diversity and ecosystem.

Genetic Diversity

- refers to the variety of genetic information contained in all individual plants, animals and micro- organisms

Species Diversity

- Refers to the variety of living species

Ecosystem Diversity

- Relates to the variety of habitats, communities and ecological processors and the diversity that is found within them

Importance of Biodiversity in an Ecosystem

1. Provides humans and organisms with food , medicine and shelter.

2. Helps to keep our water clean.

3. Helps to form and maintain soil structure and keeps the soil moist and rich in nutrients

4. Nutrient storage and recycling

5. Breaking down and absorption of pollutants created by human activities such as oil spills, rubbish and waste water.

6. Contribute to stability in climate

Changes in the ecosystem

- Changes in ecosystem cause threats to the biodiversity of that ecosystem.
- This results in:

i. Using up natural resources before they can be renewed. Eg overfishing in oceans, overharvesting of trees on land.
ii. Habitat destruction like clearing forest or draining wetlands for new developments and agricultural purposes
iii. Releasing invasive species into foreign ecosystems like African tulip in forest and tilapia in Rewa river.
iv. Any kind of pollution
v. Failure of food chains

How can you help Biodiversity?

- Do not use pesticides- they kill plants and animals

- Use cloth napkins

- Recycle old newspapers and buy recycled paper products

- Always use eco- friendly cleaning products

Effects of changes on organism

- Decrease in the number of species (endangered)

- Decrease in food supply

- Loss and degradation of habitat

Human activities that contribute to these changes in the ecosystem

- Improper waste disposal ands polluting of environment

- Reclamation of land for use through development

- Burning and deforestation/logging

Exercises

1. List some short and long term effects change in biodiversity in the table below

Short Term Effects	Long Term Effects

2. Compare and contrast the following

i) Exotic and Native species

_____
_____
_____
_____

ii) Overharvesting and Sustainable yield

_____
_____
_____
_____

3. Distinguish between the two terms

i) Biodegradable and non- biodegradable

_____
_____
_____
_____

ii) Conservation and Destruction

_____
_____
_____
_____

Week 2 12th – 16th July, 2021

Achievement Indicators

- Explain the work of Bio-security Authority of Fiji

The work of Bio-security Authority of Fiji

Bio-security authority of Fiji is mandated to:

1. Protect Fiji agricultural sector from the introduction and spread of animal and plant pests and diseases

2. Manage quarantine controls at our boarders to minimize the risk of exotic pests and diseases entering the country.

3. Provide import and export inspection and certification to help retain Fiji's favourable animal, plant and human health status and wide access to overseas export markets.

Natural solution on biodiversity conservation and protected areas

- Fencing
- Marine protected areas
- Community involvement

Exercises

1. Identify human activities that lead to the destruction of loss of habitat?

_____
_____
_____

2. Distinguish between the two term

i) Endangered and Threatened

_____
_____
_____
_____

ii)Endemic and Extinct

_____
_____
_____
_____

3. Identify ways in which human pollute the environment and explain the effects of pollutants on biodiversity

_____
_____
_____
_____

Week 3 – 19th – 23rd , July 2021

Achievement Indicators

- Define the terms sustainability and conservation

- State the different conservation groups.

Sustainability and the need for conservation

Sustainability

- Means taking no more from nature than is naturally replaced in the long run.

- Sustainable use can keep going for a long time

Conservation

- is the protection of valuable resources and management of forests, oceans, swamps and many more.

- it is the protection of our planets biodiversity and the things that we consider very useful.

Types of Conservation

1. Wildlife conservation

2. Soil conservation

3. Energy conservation

Need for Conservation

- Planting a tree

- Picking up rubbish

- Encouraging people to help with conservation

- Promoting conservation

Wildlife Conservation

- is where people protect various endangered species from becoming extinct

- this includes both plants and animals that have been identified as being at risk.

Factors that lead to extension of such species

- Deforestation

- Overharvesting

- Various types of pollution

Conservation groups in Fiji

There are a number of conservation groups both government and non-government organisation which play a role in the conservation of biodiversity of plants(flora) and animals(fauna) in Fiji

1. Wold Wildlife Fund (WWF)

- is one of the world top organizations in preserving wildlife.

- it works with several countries over the world and uses the best scientific knowledge available to protect ecosystems and to come up with various developments options with regards to preservation, efficient use of natural resources and to deal with other environmental issues that have great impact on the lives of endangered species.

2. Birdlife Fiji

- works with the communities of Natewa Peninsula (Island of Vanua Levu) to promote conservation of avifauna and biodiversity.

3. Mareqeti Viti (Nature Fiji)

- this was Fiji's first NGO, established in 2006 for terrestrial conservation

- it works for the conservation and sustainable management of Fiji's unique natural heritage.

. Its role is:

i) raising the level of conservation and environmental awareness and education in all aspects of wildlife conservation and management.

ii) Providing opportunities for children to learn of the remarkable natural heritage of our islands and seas.

iii) Recognise the key role of Fiji's indigenous landowners and promote to them a better understanding and awareness of Fiji 's Wildlife.

iv)Assist in conservation projects, wildlife management and island restoration projects.

Exercise

1. Tagimaucia is a flowering plant found only on the island of Taveuni is an example of _____.

A. native species C. exotic species

B. invasive species D. endemic species

2. The conservation organisation formed in 2006 for the conservation and sustainable management of Fiji's unique natural heritage is the _____.

A. Birdlife Fiji C. World Wildlife Fund

B. Nature Fiji D. Wildlife Conservation Society

3. Which of the following is a role of Bio-security Authority of Fiji? _____

A. Protect endangered plants

B. Protect endangered animals

C. Assist in wildlife conservation

D. Quarantine control to reduce risk of pests and diseases

Week 4 – 26th – 30th , July 2021

Strand: Matter

Sub Strand: Investigating Matter

Achievement Indicators:
- Define Matter

- Explain the structure and properties of atoms

- Calculate number of protons, electrons and neutrons in a given atom.

Matter

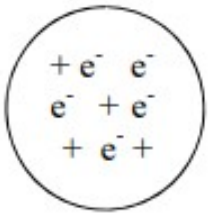
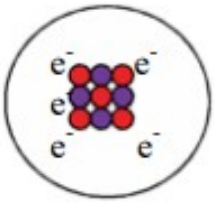
- matter is everything around us or anything that takes up spaces and has mass

- matter is made up of tiny particles called atoms

- matter has three states namely solids, liquids and gases

Structure and Properties of Atoms

Different modes of Atoms

Model	Structure
Dalton's model (1807): Model shows the atom as a hard dense sphere.	
Thomson's model (1903): Model shows the electrons scattered throughout the atom.	
Rutherford's model (1911):Model shows the atom with a dense nucleus, made up of protons and neutrons and surrounded by negatively charged electrons.	

Atoms

- are building blocks of all matter

Composition of an atom

-an atom consists of a central nucleus that contains protons and neutrons

Protons

- are positively charged (+) particles

- present in the nucleus of an atom

Neutrons

- have no electrical charge

- present in the nucleus of an atom

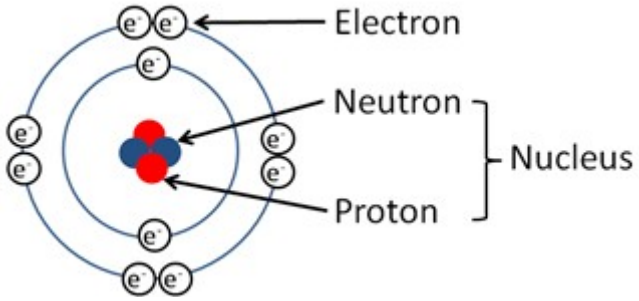
Electrons

- have a negative(-) charge

- electrons are arranged in shells orbits of different energy levels around the nucleus

Number of protons in an atom is equal to its number of electrons

The Structure of an Atom



The Atomic Number(Z)

- it gives the number of protons in the atom

- it also determines which element the atom is

Example:

Atom	Number of Protons
Hydrogen	1
Helium	2
Carbon	6
Oxygen	8

The mass number (A)

- is the number of proton plus the number of neutrons in an atom

Example:

Magnesium has:

- 12 protons

- 12 neutrons

- (A) 12 + 12 = 24 a.m.u

Symbol of an element

$_{12}Mg^{12}$

Exercise

1.Find the atomic number, mass nuber, protons, electrons, and neutrons in the following.

i) $_{7}Li^{3}$

Number of proton= Number of electron=

Number of neutrons=

Z= A=

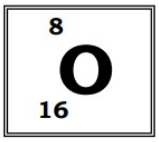
ii) $_{39}K^{19}$

Number of proton= Number of electron=

Number of neutrons=

Z= A=

2. Use the chemical symbol of an element given below to answer the questions that follow.



(i) Name the element and state its mass number.

Name _____ Mass number _____

(ii) State the number of neutrons present in the above element.

_____

_____

(iii) State one use of above element.

_____

Week 5 – 2nd – 6th , August 2021

Achievement Indicators:

- Explain the structure and properties of matter.
- Explain the different states of matter.

Structure and Properties of matter

Three states of matter:

i) Solids

ii) Liquids and

iii) Gases

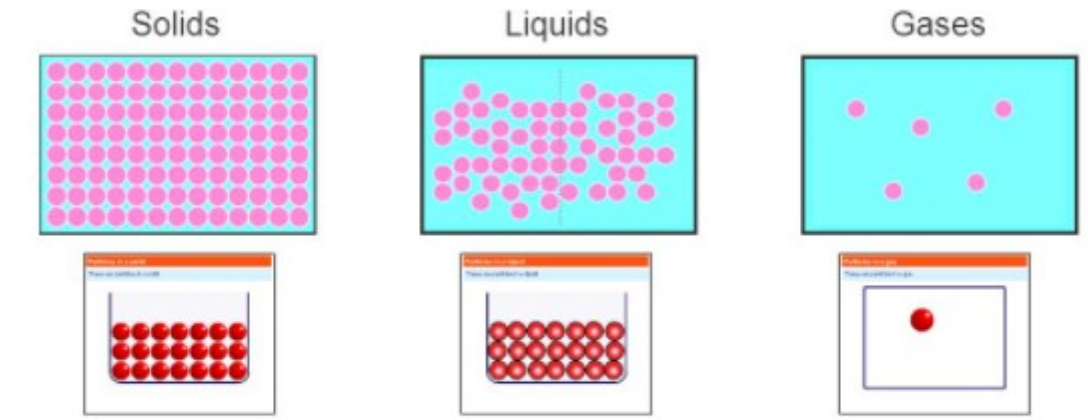
Particle Theory of Matter

- states that everything is made up of particles which are in constant motion
- these particles vibrate or move
- the movement of particles depends on how much energy they have
- the higher the amount of energy in the particles the faster the particles move

Properties of Matter

- to understand the properties of solid, liquids and gases is to imagine what is it happening to the particles they are made up of.

Particles in solids, liquids, and gases



State	Solid	Liquid	Gas
Arrangement of particles	Close together Regular pattern	Close together Random	Far apart Random
Movement of particles	Vibrate on the spot	Move around each other	Move quickly in all directions

Properties of Matter

- matter is recognised by their properties

- common properties of matter which are closely observed included colour, size and shape

- other physical properties includes:

. Elasticity

. Strength

. Hardness

. Solubility

. Density

. Melting point

. Electrical and Heat Conductivity

Physical Properties	Explanation
Elasticity	The ability of a material to return to its original shape and size after being stretched or compressed.
Strength	The ability of a material to support a mass or heavy load without breaking or collapsing.
Hardness	The ability of a material to withstand scratches and wear.
Solubility	Is the maximum quantity of a substance that can dissolve in a given quantity of the solvent (e.g 10g/100g water).
Melting point	The temperature at which a substance changes from solid to liquid.
Electrical conductivity	A measure of how readily electric current flows through a substance. Substances that allow electricity to pass through them are called conductors. Those that do not allow electric current to pass through them are called insulators.
Heat conductivity	A measure of how readily heat flows through a substance.

Exercise

Identify the physical properties you should look for in materials to make the following products

i) Furniture

_____

_____

ii) Airplane body

_____

_____

iii) Electrical plug cover

_____

_____