



UPDATED SCIENCE CONCEPTS

BY UNEB

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SOUND ENERGY

- ↘ Sound is a form of energy produced by vibrations of a material.

Sources of sound in the environment

- ↘ Radios
- ↘ Humans speaking
- ↘ Gun shot
- ↘ Motorcars
- ↘ Birds
- ↘ drums
- ↘ Guitars
- ↘ Thunderstorm
- ↘ bow harps
- ↘ bells
- ↘ Blowing wind
- ↘ panpipes
- ↘ Whistles
- ↘ Rainfall
- ↘ tube fiddles

Sources of sound

- ↘ Natural sources of sound
- ↘ Artificial sources of sound

Processes of storing sound

1. Digital recording.
2. Analog recording.

Methods of Storing Sound

There are three primary methods of recording and storing sound:

1 Mechanical (physical) Method

This is a method where physical mechanisms like grooves are used to record, store and play back sound.

Examples of devices under mechanical method include:

- ↘ Phonograph records (vinyl records)
- ↘ Cylinder records
- ↘ Gramophones
- ↘ Wire recorder
- ↘ Early tape recorders

2 Magnetic Method

This is a method where magnetic fields are used to record and store sound.

Examples of devices under magnetic method include:

- ▾ Cassette tapes
- ▾ Floppy disks
- ▾ Magnetic tape recorders
- ▾ Magnetic drum memory
- ▾ Hard disk drives (HDDs)

3 Electromagnetic Method

This is a method where electromagnetic waves are used to record and store sound.

Examples of devices under this method include:

- ▾ CDs (Compact Discs)
- ▾ Digital audio players (e.g., MP3 players)
- ▾ DVDs (Digital Versatile Discs)
- ▾ Blu-ray discs
- ▾ Solid-state drives (SSDs)
- ▾ USB drives
- ▾ Flash drives//hard drives
- ▾ SD cards
- ▾ Hard discs
- ▾ Smartphones

Methods of Writing Music

There are two primary methods of writing music:

▾ **Staff Notation:** A visual representation of music using symbols and notes on a staff.

▾ **Solfa Notation:** A system of representing music using syllables (do, re, mi, etc.) to indicate pitch.

(a) Advantages of using mechanical (Physical) Method of storing sound (Vinyl Records)

- ▣ Devices last long if taken care of
- ▣ No electricity is needed
- ▣ Devices produce warm and rich sound

(b) Advantages of using magnetic Method of storing sound (Tapes and Cassettes)

- ▣ Devices can store a lot of music
- ▣ Sound stored is easy to edit and change
- ▣ Devices are portable and easy to carry
- ▣ Devices are relatively cheap.

(c) Advantages of using electromagnetic Method of storing sound (CDs and DVDs)

- ▣ Devices produce high-quality sound
- ▣ Devices last long
- ▣ Devices resist scratches
- ▣ Devices are easy to play and navigate
- ▣ Sound takes up less space on devices.

Some advantages of using one method of storing sound over another.

- ▣ Magnetic method devices store more sound than electromagnetic method devices.
- ▣ Electromagnetic method devices produce more quality sound than physical method devices.
- ▣ Electromagnetic method devices are more(durable)resistant to scratches than physical method devices.
- ▣ Electromagnetic method devices are more portable and easier to carry than physical method devices.
- ▣ Magnetic method devices like magnetic tapes store more sound than electromagnetic method devices such as CDs.

Ways of reproducing sound

- ▣ Playing using computers
- ▣ Playing using smart phones
- ▣ Playing using subwoofers
- ▣ Playing using CD players
- ▣ Playing using MP3 players
- ▣ Playing using gramophones
- ▣ Playing using cassette players.

Importance of sound

- ▣ Helps animals to communicate
- ▣ Helps to provide evidence in courts of law.
- ▣ Helps to entertain humans.

FOOD

Food is any substance consumed to provide the body with nutrients.

Classes of food//food values

- ▣ Proteins
- ▣ Carbohydrates
- ▣ Vitamins
- ▣ Minerals
- ▣ Fats (and oils)

NB

✓ The sum of the above food values makes a balanced diet.

- ▣ A balanced diet is a diet that contains all food values in their right amount.

State the reason why babies need more protein rich foods than adults.

- ▣ To build and grow their bodies while adults need it to maintain and repair the body tissues.

State any two reasons why people consume foodstuffs.

- ☑ To build the body//To grow
- ☑ To repair worn-out body tissues
- ☑ To replace worn-out body cells
- ☑ To keep the bones strong
- ☑ To keep the teeth strong
- ☑ To get energy
- ☑ To improve body immunity
- ☑ To keep healthy/To be healthy (To prevent deficiency diseases)

Importance of eating food

- ☑ It builds the body//It helps the body to grow.
- ☑ It repairs worn-out body tissues
- ☑ It replaces worn-out body cells
- ☑ It keeps the bones strong
- ☑ It keeps the teeth strong
- ☑ It helps the body to get energy
- ☑ It improves body immunity
- ☑ It keeps the body healthy(It prevents deficiency diseases)

DEHYDRATION AND DEMINERALISATION

(a) Dehydration

- ☑ This is a condition where the human body doesn't have enough water.

(b) Demineralization

- ☑ This is a condition where the human body doesn't have enough mineral salts.

(b) Rehydration

- ☑ This is replacement of water and mineral salts in the human body.

Give any four causes of dehydration in humans

- Severe (prolonged) vomiting
- Severe (prolonged) diarrhoea
- Severe (prolonged) burns
- Severe (prolonged) scalds

Reject

✓ Severe sweating

Mention any two signs of dehydration in humans

- Dry skin
- Sunken eyes
- Reduced urine output (Little or no urine is passed out)

State any two ways of preventing dehydration in humans

Mention any two methods of rehydration

- Giving plenty of SSS
- Giving plenty of ORS
- Giving plenty of fruit juice.

Name the group of people who are given ORS/SSS.

- Dehydrated people

When should ORS/SSS be given to dehydrated person?

- Every after passing out stool
- Every after vomiting

Give the time ORS takes to expire

- 24 hours.

Components of ORS and SSS

- ☑ Water
- ☑ Sugar
- ☑ Salt

Give the function of each component of SSS in the human body.

Water

- ☑ Replaces the lost water in the human body.

Salt

- ☑ Replaces the lost mineral salts (during demineralization that takes place at the same time with dehydration)

Sugar

- ☑ Provides energy to a dehydrated person.

SEX CHARACTERISTICS (As guided by Mr. Cale Santus, NCDC Specialist)

- ☑ These are any features used to identify the sex of an individual.
- ☑ These are features that define sexual development of an individual.

Groups of sex characteristics

- (a) Primary sex characteristics
- (b) Secondary sex characteristics.

(a) Primary sex characteristics

- ☑ These are the physical features present at birth that show the sex of the child.
- ☑ These are physical features a baby is born with.

Examples of primary sex characteristics include:

- ☑ Presence of testes
- ☑ Presence of epididymis
- ☑ Presence of vas deferens

- ✘ Presence of seminal vesicles
- ✘ Presence of prostate gland
- ✘ Presence of the penis.
- ✘ Presence of ovaries
- ✘ Presence of fallopian tubes
- ✘ Presence of uterus and cervix
- ✘ Presence of the vagina.
- ✘ Presence of the clitoris.

(b) Secondary sex characteristics

- ✘ These are features that occur during puberty.

✓ They are composed of physical body changes

All secondary sex characteristics are caused by hormones called

✓ Oestrogen in females

✓ testosterone in males

Examples of secondary sex characteristics

- ✘ Growth of facial hair
- ✘ Appearance of beard mustache, and sideburns.
- ✘ Deepening of the voice in boys
- ✘ Broadening of shoulders
- ✘ Increase in muscle mass and bone density
- ✘ Growth of pubic hair
- ✘ Growth of hair on the chest
- ✘ Growth of hair under armpits and legs.
- ✘ Breast development
- ✘ Growth and enlargement of breasts

- ↘ Widening of hips
- ↘ Softening of skin and hair
- ↘ Smoother skin and hair.
- ↘ Enlargement of the penis
- ↘ Enlargement of the testicles
- ↘ Enlargement of the uterus/womb
- ↘ Enlargement of the ovaries
- ↘ Production of the sperms
- ↘ Production of ova

Groups of body changes at puberty are only three

- ✓ Physical body changes
- ✓ Emotional body changes
- ✓ Social body changes

Examples of body changes at puberty

Physical body changes

- ↘ Growth of facial hair
- ↘ Appearance of beard mustache, and sideburns.
- ↘ Deepening of the voice in boys
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- ↘ Enlargement of the ovaries
- ↘ Production of the sperms
- ↘ Production of ova

Emotional body changes

- ↘ Attraction to opposite sex
- ↘ Desire to be independent

(Increased independence)

- ↘ Adolescents get attracted to members of opposite sex

(Increased romantic interests)

- ↘ Adolescents become angry very fast

Social body changes

- ↘ Mood swings
- ↘ Adolescents want to be identified socially.
- ↘ Adolescents start making romantic relationships
- ↘ Adolescents start seeking for peer approval.

ESSENTIAL DRUGS AND NON ESSENTIAL DRUGS

Groups of drugs are only two;

- ▾ Essential drugs
- ▾ Non essential drugs

Essential drugs.

- ▾ Essential drugs are drugs that are commonly used by people in a society.

Classes// groups of essential drugs

- | | |
|-------------------------|----------------------|
| ▢ 1 Contraceptive drugs | ▢ 3 Preventive drugs |
| ▢ 2 Curative drugs | ▢ 4 Pain killers |

State three examples of essential drugs

- | | |
|------------------------|-----------------------|
| ▾ Paracetamol | ▾ Birth control pills |
| ▾ Yellow fever vaccine | ▾ Quinine |

Characteristics (uses) of essential drugs

Mention any two importance of essential drugs in the community

- ▾ They cure diseases
- ▾ They reduce signs and symptoms of diseases in humans
- ▾ They prevent unintended//unwanted pregnancies
- ▾ They prevent immunizable diseases
- ▾ They reduce pain
- ▾ They boost body immunity.

Non essential drugs

- ▾ These are drugs that are not commonly used by people in a society.

A TIPPY TAP

A tippy tap is foot operated hand washing facility used for cleaning hands.

The parts of a tippy tap and their functions:

☑ Container (water reservoir)

✓ It holds/keeps water for washing.

☑ Spout or outlet

✓ It directs water flow.

✓ It directs water to the hands.

☑ Stick or lever

✓ It operates the tap, allowing hands-free use.

✓ It holds the container/water reservoir.

✓ It turns water flow on or off without touching the tap.

✓ It controls water flow.

☑ Hinge or pivot point

✓ It enables the container to tip(invert itself) and pour water.

NON FLOWERING PLANTS (As guided by Senior Cale Santus)

☑ These are plants which do not bear flowers.

Groups of non flowering plants are only three

☑ Algae

☑ Spore bearing plants

☑ Seed bearing plants

Algae

✓ Algae are simple plants that do not bear flowers.

NB: They mostly live in water or very wet places.

State the way algae reproduce

- By means of fragmentation
- By means of spores.

Mention the mode of feeding in algae.

- Algae make their own food by photosynthesis.

Give any two characteristics of algae

- They make their own food.
- They reproduce by means of fragmentation or spores.
- They live in water (like ponds, lakes, and oceans) or on damp places.
- They have no flowers, stems, or roots.

Mention one example of algae

Accept

- Thallopytes

Reject

- Brown algae
- Spirogyra (pond weeds)
- Blue green algae.

Give any two importance of algae in the environment

- Source of food to aquatic animals.
- They add oxygen in the environment through photosynthesis

Reasons why algae is not grouped under spore bearing non flowering plants

- Algae are aquatic while spore bearing non flowering plants are not
- Algae reproduce by means of spores and fragmentation while spore bearing non flowering plants by spores only
- Algae has simple leaves, simple stems and roots while spore bearing non flowering plants have true roots , stems and leaves

Seed bearing non flowering plants

✓ These non flowering plants that reproduce by means of seeds.

✓ They are conifers.

Examples of conifers (seed bearing non flowering plants)

- Pine
- Ginkgo
- Cedar
- Podo
- Fir
- Cypress

State two characteristics of seed bearing non flowering plants (conifers)

- They reproduce by means of seeds.
- They have cones
- They store seeds in their cones
- They make their own food.

Importance of seed bearing non flowering plants(conifers)

- They provide soft wood for making furniture.
- They are used as live fences
- They help in making matchsticks.
- They are used for making paper products.

Spore bearing non flowering plants

These are non flowering plants that reproduce by means of spores.

Mention any two examples of spore bearing non flowering plants

- Ferns
- Liverworts
- Mosses

Mention any two characteristics of spore bearing non flowering plants

- ▣ They reproduce by means of spores.
- ▣ They make their own food.
- ▣ They have simple leaves.

Give any two importance of spore bearing non flowering plants in the environment*

- ▣ Source of food to some animals
- ▣ Shed leaves helping in soil formation.
- ▣ They add oxygen in the environment through photosynthesis

JOINTS

(places where two or more bones meet in the human body)

Meaning of term "types of joints"

- ▣ These are different classifications of connections between two or bones in the human body.

Types of joints in the human body

- ▣ Movable joints
- ▣ Immovable joints.

Movable joints

- ▣ These are types of joints that allow movements in the human body.

Examples (types) of movable joints

- ▣ Pivot joints

(Allow rotation of axis on atlas bones)

- ▣ Hinge joints

(Allow 180°movement/allow movements in one plane)

- ▣ Gliding joints

(Allow short bones to slide over each other)

- ▣ Ball and socket joints.

(Allow 360°movement/allow movements in three planes)

Immovable joints

- ▣ These are types of joints that allow no movement in the human body.

Examples of immovable joints

- ▣ Suture joints.

These are immovable joints found between skull bones.

Importance of joints in the human body

- ▣ Make the human body flexible
- ▣ Supports body movement .

ENERGY

Energy is the ability to do work

Forms of energy

▣ **Sound energy**

- ✓ Form of energy produced by vibrations of a material.

Recorded and Stored through

- ✓ Mechanical (physical) method
- ✓ Magnetic method
- ✓ Electromagnetic method

▣ **Mechanical energy**

- ✓ Form of energy that sums up potential energy and kinetic energy.

Types of mechanical energy

- ✓ *Potential energy*

Type of mechanical energy a body due to its position.

- ✓ *Kinetic energy*

Type of mechanical energy a body has due to its movement.

NB;

✓ A passenger in a moving vehicle possesses both kinetic energy and potential energy.

Reason

👉 A passenger's height from the ground is above 0. therefore potential energy.

A passenger also possesses kinetic energy.

Reason

👉 He is being displaced from one position to another.

☑ **Light energy**

✓ Form of energy that enables humans/animals to see.

☑ **Heat energy**

✓ Form of energy that flows from a hot point to a cold point.

☑ **Electrical energy**

✓ Form of energy produced by electrical charges. Commonly flows through electric conductors

☑ **Magnetic energy**

✓ Form of energy that enables magnets to attract magnetic materials.

✓ *Earth and lodestone* are examples of natural substances possessing magnetic energy.

✓ *U shaped magnets, Electromagnets, bar magnets , induced magnets and needle magnets* are examples of artificial temporary or permanent substances possessing magnetic energy.

Characteristics of forms of energy

☑ They make work possible (enables us to do work)

☑ They can be changed from one form to another.

Elements of PHC as recommended by WHO

- 1 Health education
- 2 Proper nutrition
- 3 Safe water and sanitation
- 4 Maternal and child health
- 5 Immunization
- 5 Disease prevention and control
- 5 Treatment of common illnesses
- 6 Access to essential medicines

STEMS

What is a stem

- ↘ A structure that provides support and connection between roots and leaves.

Types of stems

- ↘ Aerial stems
- ↘ Underground stems

a) Aerial stems are plant stems found above the ground.

Examples of aerial stems

- ↘ Upright(erect) stems

They are common in plants such as

- ✓ Maize plants
- ✓ Mvule plants
- ✓ Orange plants

- ↘ Weak stems

They are common in plants such as

- ✓ Cowpeas
- ✓ Cucumbers
- ✓ Beans
- ✓ White yams

Examples of weak stems

Stolons

Twiners

Creeping stems

b) Underground stems are plant stems found underground (in the soil).

Examples of underground stems

Rhizomes

These are horizontal underground stems with nodes capable of growing into new plants

Examples of rhizomes

✓ Ginger

✓ Turmeric

✓ Zoysia

Stem tubers (By Mr. Jamie Humphrey, Sure Key Examinations)

These are swollen underground stems with stored food.

Examples of stem tubers (biological classification)

✓ Irish potatoes

Corms

These are short, vertical underground stems with stored food.

Examples of Corms

✓ Gladiolus

✓ Crocus

✓ Cocoyams

Bulbs

These are underground small stems with swollen fleshy leaves.

Examples of bulbs

✓ Onions

✓ Garlic

✓ Tulips

DOCKING

Docking is the removal or shortening of the female sheep's tail.

Importance of docking female sheep.

▣ Helps to keep the sheep clean

How?

✓ By preventing the tail from getting into contact with dung and urine of a female sheep.

✓ By preventing soiling of the dung around the vulva of the sheep.

▣ Helps to prevent fly strikes.

How?

✓ By reducing the accumulation of dung and urine around the vulva that would attract fly strikes.

✓ By preventing soiling of the dung around the vulva of the sheep that would attract fly strikes.

▣ Helps to ease mating during adult stage of the female sheep.

How?

✓ By exposing the vulva to the male sheep.

Reasons for docking

✓ To prevent fly strikes

✓ To keep the sheep clean

Method of heat transfer (As guided by Mr. Cale Santus)

▣ This is the transfer of thermal energy from one body to another due to temperature difference.

Methods of heat transfer are only three

(a) Conduction method

(b) Convection method

(c) Radiation method

(a) Conduction method of heat transfer

This is the transfer of heat by vibrations of particles.

This is method of heat transfer through particle-to-particle contact.

It occurs in solids, liquids and gases.

Name the state of matter through which heat transfer by conduction is;

(I) fastest

Solids.

Reason

✓ Particles are closely packed to each other.

(II) Slowest

Gases

Reason

✓ Particles are widely spaced. (This reduces direct contact and energy transfer between particles)

(b) Convection heat transfer method

This is the transfer of heat by movement of whole material.

This is the heat transfer method by movement of the whole material.

It occurs in fluids(liquids and gases).

Name the state of matter through which heat transfer by convection is

(I) fastest

Gases.

Reason

✓ Gases have well widely spaced particles.

(II) Slowest.

Liquids

Reason

✓ Liquids have moderate spaced particles.

State the reason why gases transfer heat faster than liquids by convection.

☑ Gases expand more than liquids when heated.

☑ Gases have more widely spaced particles than liquids.

(There is more free movement of the whole mass in gases than liquids).

State any one difference between heat transfer by conduction and convection (02 marks)

☑ Conduction occurs in solids, liquids and gases while convection occurs in liquids and gases only.

☑ Heat is transferred through direct particle to particle contact within a material through conduction while in convection, heat is transferred through movement of the whole fluid due to density differences.

(c) Radiation heat transfer method

☑ This is the diffusion of heat.

☑ This is the method of heat transfer through electromagnetic waves in a vacuum.

It occurs through a vacuum (space without matter/molecules)

Name the fastest method of heat transfer

☑ Radiation.

Reasons

☑ It travels at the speed of light.

☑ It doesn't need a medium for transmission.

State the reason why conduction and convection cannot occur in the vacuum.

☑ There is no matter in the vacuum.

☑ There is no molecules in the space without matter.

LEAVES

Leaves are mostly green and flat parts of the shoot system of plants that make food.

Importance of leaves

- ✓ Leaves make food for the plant.
- ✓ Leaves carry out exchange of gases in plants.

Types of leaves.

Simple Leaves

✓ These are leaves that have a single blade or lamina attached to the stem (or branch) by a petiole/ leaf stalk.

Characteristics of simple leaves

- ✓ Their lamina is undivided.
- ✓ They have single blades.



Examples of plants with simple leaves

- | | | |
|--------------------|------------------|---------------------|
| ✓ cassava plants | ✓ Coffee plants | ✓ watermelon plants |
| ✓ mango plants | ✓ pumpkin plants | ✓ guava plants |
| ✓ oak plants | ✓ pawpaw plants | ✓ avocado plants |
| ✓ Jackfruit plants | ✓ coconut plants | ✓ banana plants |

Compound Leaves

✓ These are leaves that have their blade/lamina completely divided to form the leaflets.

Characteristics of compound leaves

-  They have many leaflets each having a small stalk attached to the main central leaf stalk.
-  Their blade/lamina is completely divided to form these leaflets.

Examples of plants with compound Leaves

- ✓ palm trees
- ✓ Oxalis plants
- ✓ Acacia plants
- ✓ bean plants
- ✓ Mimosa plants
- ✓ locust trees
- ✓ pea plants
- ✓ Moringa trees

Note

Regarding cassava leaves, they are have *simple leaves*, not compound leaves or compound digitate.

Cassava plants

They are characterized by

- ✓ a single, undivided leaf blade
- ✓ undivided leaf blade with a lobed or palmate shape, having 3–7 lobes radiating from a central point.
- ✓ Unlike compound leaves, cassava leaves do not have separate leaflets attached to a central stalk.

Note

When teaching, you can highlight the characteristics of simple leaves

- ☑ They have single blades
- ☑ Their lamina(or blade) is undivided

A WEATHER CHART

What is a weather chart as used commonly in primary school?

- ☑ This is a simple made chart for tracking and recording the daily weather.

Components of a weather chart

- ☑ Table with days of the week.
- ☑ Symbols representing different weather conditions of each day.

Importance of weather charts at school

- ☑ Helps school children to develop observation skills.

- ☑ Encourages school children to record and track data.
- ☑ Introduces school children to basic meteorology concepts.
- ☑ Fosters curiosity and awareness about the weather conditions in the environment.
- ☑ Helps learners to learn and grasp different weather conditions.

HUMAN BODY

Importance of the following in the human body

✓ The Kidney

- To produce urine

The larynx

- ☑ Contains vocal cords for producing sound
- ☑ Helps regulate airflow into the lungs

✓ The epiglottis

- ☑ Separates the trachea from the esophagus
- ☑ Prevents food and liquids from entering the airway and lungs during swallowing
- ☑ Prevents choking

✓ The stomach

- ☑ Digests food into smaller molecules
- ☑ Produces gastric juice
- ☑ Mixes food with digestive enzymes and acids
- ☑ Breaks down proteins
- ☑ Absorbs alcohol
- ☑ Absorbs simple sugars
- ☑ Absorbs common salts

✓ The duodenum

- ↘ Receives partially digested food from the stomach
- ↘ Receives pancreatic juice
- ↘ Mixes food with bile
- ↘ Mixes food with pancreatic juices
- ↘ Digests fats using pancreatic lipase.
- ↘ Digests proteins using pancreatic trypsin.
- ↘ Digests carbohydrates using pancreatic amylase.

✓ The ileum

- ↘ Absorbs nutrients(digested food)
- ↘ It is where digestion ends.

✓ The colon

- ↘ Absorbs water
- ↘ Stores and ferments undigested carbohydrates.

✓ The rectum

- ↘ Keeps faeces until elimination (defecation).Take this sir.

Groups of crops

- ↘ Annual crops
- ↘ Perennial crops
- ↘ Bi annual crops

Types of crops

- ↘ Vegetables crops
- ↘ Legumes
- ↘ Tuber crops
- ↘ Fruit crops
- ↘ Cereal crops
- ↘ Cover crops

Thank you for your cooperation.

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