BASIC SCIENCE 1

FOR

Junior Secondary School

AKADALEARN

JSS 1

BASIC SCIENCE

FIRST TERM

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Week 1

Topic: Living and non-living things (I)

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- Meaning of Matter
- Identification of matter
- Classification of Matter
- States of Matter

Introduction

All materials in the world around us have two qualities in common. Each occupies space and has weight. If you occupy a seat, no one else can sit on that seat because you have occupied that space. If you stand on a weighing balance, the balance will record your weight. These two qualities that you have are qualities which goats, sheep, cows, chickens, plants, stones, pebbles, tables, pots, and other materials also have. Since all these have these common qualities, they are put together in one group called matter.

Meaning of matter

The Longman Dictionary of Contemporary English defines matter as 'a subject or situation that you have to think about or deal with.' In science, however, the word matter has a difference and specific meaning. In science, matter means something which has weight and occupies space.

Identification of matter

Materials required: Science notebook

Procedure:

1. Each member of the class should bring forward and place on the teacher's demonstration table, one item taken from the classroom.
2. Look at the items one after the other.
3. In respect of each item, ask yourself if it occupies space and has weight
4. Make a list in your science notebook of all the items that occupies space and have weight. Make a separate list of items which do not occupy space or have weight. How

many items do you have on this list?

Classification of matter

We will sort matter into living and non-living matter. Materials required include: science notebook, plastic bags, collecting bottles;

Procedure:

1. Your teacher will guide you on a nature walk in your school compound. During this walk, collect samples of matter. Your collection may include plants (or its part, insect, fruits, seeds, stones, animals, pieces of metal, glass and plastic).
2. Put the animals in a specimen bottle and the other materials in plastic bags.
3. Return to the classroom
4. In the classroom, sort your collection into living and non-living things.
5. Write the names of the things in each group.
6. Write down the characteristics of living things which you used in sorting matter into living and non-living things.
7. In this activity, you have sorted matter into living and non-living matter. Is there any other way in which matter may be sorted into groups?

States of matter

Some children like to suck ice cubes. As a child sucks an ice cube what happens to the ice cube? Does it change into water? What happens when you boil water? Does some of the water change into steam? In fact, if you forget a kettle of water on a fire, you may end up with an empty kettle! These two common events show us that ice can change into water and water into steam. Ice is a solid, water is a liquid and steam is a gas. These three forms of matter: solid, liquid and gas are called the Three states of matter. When matter changes from solid to liquid, liquid to gas, or vice versa, it is said to undergo a change of state. Can you name any other substances that undergo change of state?

Exercises:

1. All materials in the world are made of ___ and ___?

a. sugar and salt

b. coal and bone

c. weight and space

d. male and female

2. These two qualities you chose above are also present in cows, goats and dogs? True or False

a. True

b. false

c. I don't know

d. None of the above

3. One of the following is not a characteristic of living thing

a. living things move

b. living things don't change

c. living things reproduce

d. living things dies

4. The process of a scientist sorting things into sets is called

a. classification

b. charting

c. driving

d. painting

5. How many states of matter exist?

a. 49

b. 12

c. 4

d. 3

Answers:

c

a

b

a

d

Week 2

Topic: Living and non-living things (II)

Contents

- Characteristics of living and non-living things
- Examples, characteristics and importance of plants and animals

Introduction

Both living and non-living things are important to human beings. Both plant and animals are living things because both have the same qualities of living things. on the other hand, we obtain food from living things but we also depend for successful living on non-living things. need air to breathe, we need water to drink, cook, wash our bodies clothes and so on; without iron and steel, we would not have our knife and refrigerators.

Characteristics of living and non-living things

The characteristics of living things are summarized below. Living things:

- Move
- Feed
- Respire
- Excrete waste substances
- Grow
- Reproduce
- Respond to their environment

Examples of Plant and Animals

Examples of Plants are:

— Carpet grass

— Bahama grass

— Hibiscus flower

— Ixora

— Mango

— Orange

— Pawpaw

Examples of Animal

Examples of Animals are:

— Cat

— Dog

— Sheep

— Goat

— Squirrel

— Elephant

— Snake

Importance of Plants

1. Plants and animals are important to human beings in many ways. These uses are briefly described below:
2. Plants provide human beings with food such as vegetables, fruits, tubers and so on. Examples include yam, tubers, cassava, rice, spinach, tomatoes etc.
3. Plants provide human beings with firewood
4. Plants provide human beings with timber
5. Plants produce materials which are useful to human beings such as fibers and latex (e.g. rubber)
6. Some medicine that cures human diseases are obtained from plants
7. Plants beautify the human environment
8. Roots of plant hold soil particles together and reduce soil erosion

9. Leaves of plants break the force of rain drops and thereby reduce soil erosion
10. Transpiration helps the water cycle and promotes rainfall which helps human beings to grow crops
11. Plants are eaten by our domestic animals
12. Plants remove carbon dioxide from the atmosphere during photosynthesis and give out oxygen, thus helping to restore the proportion of oxygen and carbon dioxide in the atmosphere.

Importance of animals

1. Animals are eaten by human beings
2. Some animals e.g. donkey and camels are used by human beings as beasts of burden
3. Some animals are used for transporting human beings e.g. horses and camels
4. The dog is used to watch over property
5. Animals are sold to earn money e.g. goat, sheep, pigs, poultry.

Exercises

1. A living thing _____

a. moves

b. grows

c. respires

d. reproduces

e. does all the above

2. A plant differs from an animal because a plant _____

a. respires

b. grows

c. moves

d. reproduces

e. makes its food

3. Which of the following is not normally present in animal cells?

a. living matter

b. nucleus

c. cytoplasm

d. chlorophyll

e. cell membrane

4. Name four examples of plant and animals

5. Human beings are living things; true or false?

a. True

b. False

Answers

1. a
2. e
3. a
4. plants – herb, cowpea, maize, rose & animals – goat, snail, cow, lion
5. True

Week 3

Topic: Living and Non-living Things (III)

Contents:

- Differences between Plants and Animals
- Examples and Importance of Living Things

Introduction

Both plants and animals are living things because both have the same qualities of living things. However, there are important differences between plants and animals.

Differences in Structure between Plants and Animals

PLANTS	ANIMALS
Have roots	Have no roots
Have stems	Have no stems
Have leaves	Have no leaves
Have flowers, fruits, and seeds	Have no flowers, fruits, and seeds
Have chlorophyll (green colouring in plants)	Have no chlorophyll
Have no definite shape	Have a definite shape
Are made up of many parts i.e leaves, branches, roots	Do not have many parts

Differences between Plant and Animal Cell

PLANT CELL	ANIMAL CELL
Presence of cellulose cell wall	Cell wall absent
Cell vacuoles present	Cell vacuoles normally absent
Chloroplasts present	Chloroplasts absent
Cytoplasm does not fill the cell	Cytoplasm fills the cell
Cell sap present	Cell sap absent

Differences in Plant and Animal Functions

	PLANT	ANIMAL
Movement	Do not move from place to place but carry out bending movements	Move from place to place
Breathing	Have no complex organs for breathing	Breathe through complex organs such as lungs and gills
Feeding	Make their own food	Feed on plants and other animals, cannot make their own food
Excretion	Have no complex organs for excretion	Have complex organs for excretion, e.g. kidneys and lungs
Growth	Grow in length only at the tip of stems and roots	Grow in length in all parts of the body
Sensitivity	Respond slowly to changes in the environment except for sensitive plants	Respond quickly to the changes in the environment
Reproduction	There is no courtship in reproduction	There is usually courtship in reproduction

Examples of Living Things – Plants

HERBS	FLOWERS	TREES
Crotalaria	Hibiscus	Mango
Carpet grass	Ice plant	Orange
Bahama grass	Ixora	Guava
Yellow bush	Pride of Barbados	Pawpaw
	Neem	
	Cassia	

Examples of Living Things – Animals

PETS	FARM ANIMALS	WILD ANIMALS
Cat	Goat	Rat
Dog	Sheep	Squirrel
	Cow	Weaver bird
	Chicken	Elephant
	Rabbit	Snake
		Tse-tse fly

Assessment

1. A living thing (a) Moves (b) Grows (c) Respires (d) Reproduces (e) Does all of the above
2. A plant differs from an animal because a plant (a) Respires (b) Grows (c) Moves (d) Reproduces (e) Makes its food
3. Which of the following is not normally present in animal cells? (a) Living matter (b) Nucleus (c) Cytoplasm (d) Chlorophyll (e) Cell membrane
4. Both plants and animals are living things because of _____
5. Mention 3 differences between plants and animals

Answer

1. E
2. E
3. D
4. both have the same qualities of living things.
5. 3 differences between plants and animals

	PLANTS	**ANIMALS**
Movement	Do not move from place to place but carry out bending movements	Move from place to place
Breathing	Have no complex organs for breathing	Breathe through complex organs such as lungs and gills
Feeding	Make their own food	Feed on plants and other animals, cannot make their own food

Week 4

Topic: Living and Non-living Things

Contents:

1. Classification of Non-living things into metals and non-metals
2. Examples, properties and uses

Introduction

Both living and non-living things are important to human beings. We obtain food from living things. We also depend, for successful living on non-living things. we need air to breathe, water to drink, cook, wash our bodies, our clothes etc. We need the soil for growing plants, sand and stone for building houses. Without iron and steel, we would not have knives, cars, refrigerators etc.

Classification into Metals and Non-metals

METALS	**NON-METALS**
Shiny	Not shiny
Can be hammered into a sheet	Cannot be hammered into a sheet
Can be drawn into a wire	Cannot be drawn into a wire
Good conductor of electricity	Bad conductor of electricity
Good conductor of heat	Bad conductor of heat
Makes a sound when hit	Does not make any sound when hit

Examples of Metals

Iron

Steel

Copper

Aluminium

Zinc

Tin etc

Uses of Metals

METALS	USES
Iron and Steel	Making cars, sips, airplanes, lorries, refrigerators, ovens, generators, pillars and poles, iron sheets, electric fans etc
Copper	Making electric wires
Aluminium	Making electric wires and cooking pots
Tin	Covering of iron to prevent rusting
Zinc	Making torch batteries, covering iron in corrugated iron sheets to prevent rusting
Lead	Making car and lorry batteries

Uses of Non-metals

NON-METALS	USES
Carbon	In torch batteries
Sulphur	In medicines
Oxygen	In respiration, burning
Nitrogen	As a component of proteins
Chlorine	In disinfecting water

Assessment

Which of the following is not a living thing?

a. grass

b. grasshopper

c. earthworm

d. water

Which of the following is a living thing?

a. An Ant

b. A piece of paper

c. A plastic cup

d. A glass bottle

Aluminum is used for making pots because it is

a. a good conductor of electricity

b. a metal

c. a non-metal

d. a good conductor of heat

___ is an example of a metal

a. Carbon

b. Copper

c. Sulphur

d. Graphite

Name four non-metals

Answers

1. D
2. A
3. D
4. B
5. Carbon, Oxygen, Nitrogen, and Chlorine.

Week 5

Topic: Human Development

Contents:

- Meaning of Puberty
- Puberty/Adolescent changes
- Personal Hygiene
- Menstruation
- Coping with concerns of Adolescent

INTRODUCTION

At about ten to fourteen years of age, different changes take place in the body of both boys and girls. These changes are signs of puberty.

A. WHAT IS PUBERTY?

Puberty is the short span of time which marks the beginning of sexual maturation. This period differs in both boys and girls. Boys gradually reach puberty at about the age of twelve, while girls reach at about ten to eleven.

Puberty is the period during which growing boys or girls undergo the process of sexual maturation. In other word, Puberty is the time when a young person's sexual and reproductive organs mature. Puberty involves a series of physical stages or steps that lead to the achievement of fertility and the development of the so-called secondary sex characteristics, the physical features associated with adult males and females (such as the growth of pubic hair).

The onset of puberty varies among individuals. Puberty usually occurs in girls between the ages of 10 and 14, while in boys it generally occurs later, between the ages of 12 and 16.

DIFFERENCE BETWEEN ADOLESCENCE AND ADOLESCENTS

Adolescence is the period in every individual's life that lies between the end of childhood and beginning of adulthood. It is specially a period in one's life, when you prepare to be an adult while adolescent is a boy or girl that is passing through the adolescence period.

SIGNS OF PUBERTY

BOYS	GIRLS
There is increase in height	The increase in the girl is rapid, but boys later catch up with them and may overtake them
Voice breaks and become deeper and their chest broader	Hips become broader
The boys have wet dreams	Sex organs develop Menstruation starts
	The breast develops

SIMILAR SIGNS IN BOYS AND GIRLS

- Pimples sometimes appears on their face but they usually disappear after a time
- Hair grows under armpits of both girls and boys and at the lower end of the abdomen, around the reproductive organs, beard around the jaw.

Physical changes for girls at puberty

The physical changes that happen for girls around puberty include:

- Height– they will grow taller
- Curves develop – their hips will widen and their body will get curvier
- Breasts start to form – the first stage is called 'budding'. Sometimes, the breasts are different sizes. This is completely normal.
- Hair growth – hair will start to grow around the pubic area and under the arms, and hair on the legs and arms will darken
- Vaginal discharge – they might start to get a clear or whitish discharge from the vagina. This is a natural self-cleaning process and is completely normal
- Periods – menstrual periods will start, where they bleed from the vagina each month. Periods are part of a monthly cycle where the body gets ready for pregnancy.

Physical changes for boys at puberty

The physical changes that happen for boys around puberty include:

- Height and muscle – they will get taller and stronger and start to grow muscle

- Genitals – their testicles and penis will get bigger. It is normal for one testicle to be bigger than the other.
- Hair growth – body hair starts to grow around the pubic area, legs, under the arms and on the face.
- Voice changes – their voice gets deeper. This is sometimes called 'voice breaking' because of the ups and downs in voice tone
- Wet dreams – they might have wet dreams, where they ejaculate in their sleep. This is a completely normal part of growing up
- Erections– sometimes erections happen when they get nervous or excited, or for no reason at all, which can make them feel embarrassed.
- Breast changes – they might get some breast growth and tenderness. This is a normal response to the changing hormones in their body and will eventually go away.

Emotional changes for girls and boys at puberty

Along with the many physical changes, a lot of emotional changes happen around puberty for both boys and girls. These include:

- Coping with a changing body – young people have to deal with sudden physical changes. They now have a new body shape and might start to feel self-conscious about how they look. They might feel embarrassed if they think they are different from their friends. Other people might start to treat them differently. For example, if they look older, they might be treated as an older person
- Frustration because they feel different – it can be difficult coping with early physical changes or frustrating waiting for them to happen.
- Mood swings – the sudden release of hormones into a young person's body can bring about extreme emotions and mood swings, but this is only temporary and will settle after a while.
- Energy changes – the physical growth and other changes can make a young person feel full of energy one minute and tired the next.

COMMON CHARACTERISTICS IN ADOLESCENT BOYS AND GIRLS

- They try to gain independence from their parent
- Become self-conscious and may bother about their appearance
- Feeling of attraction to the opposite sex

- Have emotional changes. They can be anxious moody or irritable
- Could show concern about their future
- Feel hungry easily. They are growing fast, they therefore need extra food.

B. MENSTRUATION

Menstruation is the monthly flow of blood from the womb, through the vagina in every woman of childbearing age. This period is called Menstrual Period. It takes place after about every 25-30 days. The number of days before the next period is called 'Menstrual Cycle'. The menstrual period is different from one person to another.

I. MENSTRUAL HYGIENE

As the body sends out blood, it also sends out body odor. It should be noted that during the menstrual period, there is a high risk of infection.

II. MENSTRUAL HYGIENE PRACTICES

The following are the hygiene practices to follow during menstruation:

Use very good and absorbent sanitary pads

Take frequent baths (at least twice a day)

Sanitary pad should be changed to prevent odor.

Some powder may be sprinkled on the inside of each thigh to reduce the chances of the place becoming sore

Always wash your hands after each change of pad

The soiled pad should be wrapped in paper or nylon before disposing in the waste bin

C. BODY ODOUR

When a teenager reaches puberty, there is an increase in body secretion. This can lead to a bad or strong odor in both boys and girls. 'Body odor' is an unpleasant smell that comes from the body most especially during rigorous exercise or after engaging in strenuous activities.

I. CAUSES OF BODY ODOUR

1. Failure to bath regularly
2. Poor hygiene during menstruation
3. Stale perspiration.

4. Using of body care products that smells badly i.e cream, soaps, perfume etc.
5. Wearing dirty clothes i.e under wears generally
6. Accumulation of dirty on the body.

II. PREVENTION OF BODY ODOUR

1. Frequent bathing is very important i.e during menstrual period or after a rigorous exercise
2. Changing your under wears every day.
3. If you sweat a lot , use a very good deodorant especially under your armpits.
4. Dress smartly, but seriously
5. Use cosmetics moderately
6. Use light perfume especially around pulse area
7. It should be used only on clean clothes and body to give a sweet smell

Assessment

…… is one of the ways to encourage body odour

a. Changing your under wears every day

b. Use light perfume especially around pulse area

c. Brushing your teeth twice daily

d. Repeating clothes already worn

…… is a cause of body odour

a. Fresh breathe

b. Using of body care products that smells badly

c. Using of good body care products

d. Washing your clothes regularly

……. is the monthly flow of blood from the womb, through the vagina in every woman of childbearing age

a. Menstrual cycle

b. Ovulation

c. Fertilization

d. Menstruation

…… is a pubertal change in female and not in male

a. Height and muscle

b. Genitals – their testicles and penis will get bigger. It is normal for one testicle to be bigger than the other.

c. Breasts develop

d. Hair growth in pubic areas

……. is the short span of time which marks the beginning of sexual maturation

a. Puberty

b. Ovulation

c. Fertilization

d. Menstruation

Answers

1. D
2. B
3. D
4. C
5. A

Week 6

Topic: Family Health (Sanitation)

Introduction

When we clean our body regularly, we reduce the chances of getting infected by various organisms that thrive in dirty environment. An individual's health depends on the way and manner in which he or she takes care of himself or herself. If one does not maintain a high level of personal cleanliness, one is likely to suffer from diseases.

Meaning of Family, Health and Cleanliness

A family is a group consisting of one or two parents and their children while health is the condition of a person's body or mind. The three levels of health are low, average and high or optimal level.

Cleanliness is the state of being clean or the habit of keeping things clean. It is the practice of keeping yourself, your living and working area clean in order to prevent illness and diseases.

Personal cleanliness is the act of keeping oneself neat. It helps to maintain good health and prevent diseases and is a continuous exercise. It involves cleaning the nails, hair, clothes, and brushing the teeth in the morning and at night

Methods of Keeping the Body Clean

1. Cleanliness of the skin: The skin covers and protects the body. It secretes sweat which can be sticky and can cause an unpleasant smell when it dries on the skin. Also, some parasites can breed on the skin such as scabies, mites and other micro-organisms if it is not clean. Therefore, to avoid body odour and infection, you should wash your body using soap at least once daily.

2. Cleanliness of the hand and the nails: We use our hands when eating, sweeping, working at home, in the school, on the farm, etc. When they become dirty, they may carry some micro-organisms. Therefore, we need to always wash our hands before and after eating, after going to the toilet and after handling dirty. Keep your nails short so as to avoid mistakenly scratching yourself or someone else or habouring micro-organisms

3. Cleanliness of the Hair: To keep the hair clean and tidy, an individual must wash and comb it everyday. Some parasites live and survive in the hair if it is dirty. A parasite is an organism (either plant or animal) that lives and feeds on another

plant or animal (host) at the expense of that host. Parasites such as fleas and lice can easily infect a dirty person who fails to wash his or her hair regularly.

4. Cleanliness of the Teeth: You should clean your teeth after meals, at night before going to bed and first thing in the morning so as to remove food particles. Rinse your mouth with enough water to remove the food particles that are trapped in between the teeth. Mouth rinsing alone does not remove all food particles in the mouth. You should use toothpaste and a toothbrush or chewing stick. In cleaning your teeth, you must clean the outer and the inner surface, before you finally rinse it. Always remember to brush your tongue as well.

5. Cleaning of our Clothes: Clothes are used to cover the body. Our clothes should be kept clean to avoid offensive odour. Sweat from the skin is absorbed by your clothes, so you should change your clothes everyday and they should be washed with soap or detergent and dried before you wear them again.

In Summary, Methods of Keeping Our Body Clean Are:

1. By using soap to wash our hair everyday or whenever it is dirty, comb the hair everyday and ensure that you keep it as low as possible.

2. By cleaning the teeth. This should be done first thing every morning and at night before going to bed.

3. By washing the hands regularly before meals and after going to toilet.

4. By taking our bath twice a day with soap and sponge and rinse the body properly with water.

Methods of Keeping the Home Clean

1. Cleanliness of our home is very necessary as the home constitutes a major part of our environment. A clean environment brings about good health. Disease-carrying insects are not found in a clean home (environment). The following are methods of keeping our homes clean:

2. Sweeping the rooms and the surrounding regularly

3. Removing cobwebs on the walls and ceilings and disposing domestic waste properly

4. Proper disposal of domestic waste

5. Washing up used cooking utensils

6. Washing up plates, spoons and forks after use

7. Washing the toilet regularly with scouring powder and disinfecting with

disinfectant

8. Cutting down bushes around the home
9. Cleaning and polishing the furniture
10. Washing and cleaning curtains and windows blinds regularly
11. Cleaning the rugs regularly

Cleaning Agents

Cleaning agents are those substances that are used to keep the body or home clean. Examples are:

1. Disinfectants
2. Antiseptics
3. Soaps
4. Detergents

Advantages of Personal Cleanliness

Benefits of maintaining good personal cleanliness are:

1. Good health (protects the individual against diseases)
2. Social acceptability
3. Emotional stability (gives confidence to the individual)
4. Disadvantages of Poor Personal Cleanliness

When a good level of personal cleanliness is not maintained, it poses dangers to the body. Such dangers are:

1. Poor health
2. Social rejection
3. Low esteem
4. Emotional instability
5. Factors that Lead to Low Level of Personal Cleanliness

Ignorance: Some people do not have the knowledge of personal cleanliness. This makes such persons dirty always

Nonchalance: This is a poor feeling towards personal cleanliness. The person does not care about what he/she wears

Lack of time: this has to do with being engaged in so many activities which do not allow one to take care himself or herself

Tradition: Some traditions encourage uncleanliness

Questions

Which of the following is used to clean a water closet or toilet bowl

a. a bath sponge

b. a long broom

c. harpic

d. a toothbrush

If you fail to keep your hair clean and tidy, which of the following might result?

a. Bad odour

b. Bushy hair

c. Lice in the hair

d. All of the above

Which of the following might result from poor hygiene of the teeth?

a. Clean tooth

b. Tooth decay

c. Healthy gum

d. Strong tooth

What does personal hygiene mean?

State 3 methods of keeping your body clean

Answers

1. C
2. D
3. B
4. Personal hygiene is the act of keeping oneself neat. It helps to maintain good health and prevent diseases and is a continuous exercise. It involves cleaning the nails, hair, clothes, and brushing the teeth in the morning and at night
5. By using soap to wash our hair everyday or whenever it is dirty, comb the hair

everyday and ensure that you keep it as low as possible.

6. By cleaning the teeth. This should be done first thing every morning and at night before going to bed.
7. By washing the hands regularly before meals and after going to toilet.
8. By taking our bath twice a day with soap and sponge and rinse the body properly with water.

Week 7 & 8

Topic: Family Health (II) – Nutrition

Introduction

Feeding is one of the characteristics of living things. We are familiar with food and with feeding. When we eat, we stop hunger, we feel satisfied and happy. Food gives us energy, enables us to grow and stay healthy. Scientists study food from several angles ie finding the composition and properties of each kind of food.

What is Nutrition?

Nutrition is the process by which organisms take in and make use of substances that are necessary for good health such as food and minerals.

In order to achieve and maintain good health, one must have good feeding (Nutritional) habit.

What is Food?

Food is a thing which, when eaten and digested can be used by the body to provide energy, or substances that help in body building and repair or in preservation of health. Food is a nutritive material which, when taken, provides the body with energy, regulates body functions, repairs body tissues, promotes growth and helps in the regulation of body processes.

Types of Food

Foods may be grouped according to whether they are

1. Solid or liquid
2. Local or imported
3. Cereals, vegetables or fruits
4. Eaten raw or cooked

SOLID FOOD	LIQUID FOOD
Yam	Milk
Rice	Cocoa drinks
Bread	Fruit juices
Garri	

LOCAL FOOD	IMPORTED FOOD
Beans	Milk
Rice	Stock fish
Potato	Pasta
Guinea corn	Butter
Yam	Cheese

CEREAL	VEGETABLE	FRUIT
Oats	Spinach	Oranges
Cornflakes	Water leaf	Pear
Rice crispies	Bitter leaf	Water melon
	Lettuce	pawpaw
	Cabbage	Guava

<table>

RAW FOOD	COOKED FOOD
Lettuce	Yam
Pawpaw	Rice
Mango	Meat
Cucumber	Fish

There are various types of food items. Examples include cassava, meat, fish, etc.

Examples of food items and their sources are:

Food Item	Sources of Food

Cassava	Plant
Meat	Animals (Cow)
Fish	Animal (Fish)
Yam	Plant
Cocoyam	Plant
Groundnuts	Plant (Legume)
Chicken	Animal (Bird)

Classes of Food Based on their Nutrients

Nutrients are substances found within foods which nourish the body.

There are six types of food nutrients. These are: carbohydrates, fats and oil, proteins, vitamins, mineral salts and water. The classes of food based on their nutrients are:

<table>

Classes of food	**Uses**	**Examples**
Carbohydrate	Supplies energy to the body	Yam, maize, bread, sugar, potato, maize, wheat etc.
Protein	For body building(growth) and repair of worn out tissues	Eggs, meat, fish, milk, beans,cheese, yoghurt etc.
Fats & Oil	Supply energy to the body	Groundnuts, milk, palm oil,cod liver oil, olive oil, margarine etc.
Vitamins	Protect the body against diseases	Fruits, milk, vegetables, etc.
Mineral Salts	For body metabolism, bone and teeth formation	Table salt, bones, water, etc.
Water	For chemical reactions to take place, temperature regulation, etc.	Water

What is Adequate Diet?

An adequate diet is that diet which contains all the food nutrients in their proper proportion. An adequate diet is one that is sufficient in quatity and food nutrients in the required amounts or proportions. An adequate diet is also called a Balanced diet. For good health and growth of the body, the correct combination of these food nutrients in our meal is very important. The reason why we should take an adequate or balanced diet is that each nutrient has its own functions.

Example of an adequate diet.

DAYS	BREAKFAST	LUNCH	DINNER
Monday	Pap, akara	Eba, vegetable soup, meat	Yam, vegetable stew, fish
Tuesday	Bread, margarine, bournvita and milk	Moimoi/fruit	Rice, vegetable stew, fish
Wednesday	Yam, Vegetable stew and fish	Beans, fried or boiled plantain, fruit	Salad, fresh vegetables such as tomatoes, greens

Questions

Which of the following is not a food item

a. Milk

b. Spinach

c. Alcohol

d. Orange

A disease that results from the lack of a vitamin is called ____

a. a protein deficiency disease

b. kwashiokor

c. a vitamin deficiency disease

d. a hunger illness

Which of the following is a function of Carbohydrates

a. Providing energy

b. Body Building

c. Preserving health

d. Blood purification

How many classes of food are contained in an adequate diet

a. 2

b. 6

c. 5

d. 4

An adequate diet is also known as _____

Answers

1. C
2. C
3. A
4. B
5. Balanced diet

Week 9

Topic: Family Health – Drug

Contents:

- Meaning of Drug and Drug abuse
- Sources of Drugs
- Methods of Drug Abuse
- Causes of Drug abuse
- Uses and side effects of Drugs

Meaning of Drug and Drug Abuse

Drug: is a chemical substance used in the treatment, cure, prevention, or diagnosis of disease or to otherwise enhance physical or mental well-being. A drug is any substance other than food that by its chemical or pysical nature can affect the structure and functions in a living organism. When drugs are administered under proper medical supervision, they can serve three objectives namely

- to relieve suffering
- to combat diseases
- to save lives

Drug Abuse: This is the use of illegal drugs or the misuse of prescription or over-the-counter drugs for at least a year with negative consequences. In the word, drug abuse is the habitual use of drugs to alter one's mood, emotion, or state of consciousness. It is also the excessive persistent use of a drug without regard to accepted medical practice.

Drug Misuse: It is the use of a drug for a purpose or condition for which it is not suited or the use of a drug for an appropriate purpose but improper dosage.

Sources of drugs

- Plant sources
- Animal sources
- Mineral/ Earth sources

- Microbiological sources
- Semi synthetic sources/ Synthetic sources
- Recombinant DNA technology

Classification of Drugs

Narcotics – Used to blunt the senses. They make people sleep and relieve them of pain. They act as depressants to certain areas of the brain and nervous system.

Opium – In medicine, opium is used as a source of the drug morphine. Morphine is a pain killer drug.

Sedatives – They are drugs used to relax the central nervous system and induce sleep. e.g Barbiturates

Stimulants – Drugs that excite the central nervous system. e.g caffeine, cocaine and amphetamine

Tranquilisers – Drugs that change or modify an individual's emotional state or mood. e.g valium, librum

Hallucinogens – Drugs capable of provoking changes of sensation, thinking, distorted perceptions, self – awareness and emotions. They alter the user's ability to separate fact from fantasy.

Methods of Drug Use

This is also called drug delivery. The most common methods of delivering drug include:

- Non-invasive oral (mouth/ingestion)
- Nasal or Pneumonial (inhalation)
- Smoking
- Injection
- Tattooing

Common Ways of Misusing Drugs

- Some people misuse drugs ignorantly while others do so by the profession they have chosen in life e.g. athletes, wrestler. Ways of misusing drugs include:
- By addiction: This is recurring compulsion by an individual to engage in an activity that is difficult to discontinue once the individual has commenced the activity. The term addiction is often reserved for the abuse of substances that directly stimulate

the brain. It has been extended to activities such obsessive gambling, drinking, smiting and eating.

- Self Injecting: some athletes indulge in self-injecting of drugs in order to improve their performances. This is called doping.
- Over-dose and over eating: by own mistake, a patient may ingest more tablets of prescribed drugs in order to quicken recovery. This is mere ignorant. Excessive eating of certain food items like kolanut during examination can leads to misuse.
- Abduction, kidnapping and raping action: some activities such as raping, kidnapping or abduction are done under the influence of conscious drug abuse in other to succeed. Also, the victim may be drugged purposely so that he/she would not raise alarm or resist the action.

Social Risk Factors in Drug Abuse

1. Social Isolation
2. Broken Homes
3. Peer influence
4. Wealth Acquisition (Materialistic value)
5. Workplace Violence
6. Social Anxiety
7. Drug Court
8. War on Drugs
9. Drug Prohibition

Causes of Drug Abuse

While many people use drugs, only a small percentage abuse drugs, but it has been noted drug abuse often runs in families, suggesting genetics is one of the causes of drug abuse. While having parents that abuse drugs puts a child at risk, it is possible for the child to grow up without drug abuse problems. It is also possible to abuse drugs without having any other drug abuser in the family. It is clear genetics alone is not the cause of drug abuse.

There are certain life circumstances, particularly among younger users, that are risk factors for, rather than the direct cause of, drug abuse. Parental abuse and neglect are commonly seen as part of the cause of drug abuse. An adolescent or pre-adolescent may be trying to gain attention from an inattentive parent or escape an abusive one by using drugs;

prolonged attempts through drug use can be a cause of drug abuse. A drug user, or the presence of drugs in the home, can also be a major cause of drug abuse.

Additional risk factors contributing to the causes of drug abuse include:

- Unstable home environment, often due to drug abuse or mental illness of the parent
- A poor relationship with parents
- Use of drugs by friends / peers
- Permissive attitude towards their own drug use and the drug use of the adolescent
- Behavioral problems combined with poor parenting
- Poor achievement in school
- Apparent ambivalence or approval of drug use in the school, peer group or community
- Availability of drugs from friends

Effects of Drug Abuse

- It can lead to stomach upset.
- It can lead to damaged nostrils and lungs.
- It can lead to skin rashes.
- It can lead to injection abscesses.
- It can lead to poor academic achievement.
- It can lead to uncontrollable sexual urge.

Ways of preventing Drug Abuse

- Drug abuse or drug misuse may be prevented in the following ways:
- Appropriate but harsh legislation against abusers.
- Application of religious ethics.
- Avoiding the sharing of injection needles so as to reduce the rate of HIV/AIDS infection.
- Using drugs only as prescribed by doctors.

- Regular awareness campaign against drug misuse.

Questions

Causes of drug abuse include ____

a. Use of drugs by friends / peers

b. Unstable home environment

c. A poor relationship with parents

d. All of the above

Which of the following is not a group of drugs

a. Narcotics

b. Sedatives

c. Cocaine

d. Stimulants

Marijuana is a drug abused by young people. True or False

____ are a group of drug that excites the nervous system

____ are drugs capable of provoking changes of sensation and distorted perceptions

Answers

1. D
2. C
3. True
4. Stimulants
5. Hallucinogens

Week 10

Topic: Reproductive System

Contents:

Male and Female Reproductive Organs

Functions and Care of Male and Female Organs

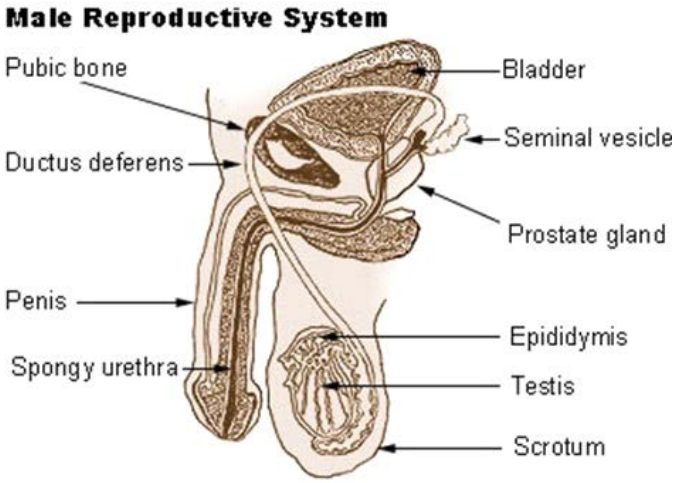
Introduction

One of the characteristics of living things is their ability to produce young ones of their kind. Any living organism that gives birth to new offspring is said to undergo reproduction. Every living thing reproduces its kind. Human beings also give birth to their young ones, etc. They do this by the process of reproduction. In human beings this involves the coming together of reproduction cells produced by male and female parents. The reproductive cell in males are called spermatozoa while that of a woman is called ovum or egg. The organs of the body wich work together to produce young ones in human beings are the human reproductive system.

Reproduction

It is the process by which living things produce their kinds. Mammals such as human beings reproduce their young ones and take care of them until they become independent. The organs responsible for reproduction make up the reproductive system.

Parts of the Male Reproductive System



The male reproductive organs include:

Testes

Penis

Vas deferens

Urethra

Prostate gland, cowper's gland and seminal vesicles

reproductive

The penis lies between the legs attached to a bag of skin called scrotum. When at rest, the penis lies flat. When sexually excited, it becomes erect and changes its shape and size as blood rushes into it. The scrotum contains 2 testes. The testes are connected to the penis throug tiny tubes. The main function of the testes is to produce the reproductive cells called spermatozoa or sperms. The sperms produced are passed through the sperm ducts to where they are stored in a sperm sac. When the sperms are ready to be released, some fluid substances are secreted to mix with the sperm cells to form semen. The fluid helps the sperm to swim and flow when released into the vagina. The sperm cells can swim beyond the vagina to meet an egg cell waiting in a female organ called fallopian tube. If a sperm meets an egg, the two will fuse. The fusion of the sperm and the egg is called fertilisation.

Functions of the Male Reproductive Organ

Testes

These are pairs of oval structures consisting of a mass of coiled seminiferous tubules where sperm cells are produced. The testes are placed in the scrotal sac which hang from the groin. They also produce a hormone known as testosterone that is responsible for bringing out secondary sex characteristics in man.

Penis

This is a rectile organ that is attached and suspended from the base of the abdomen. Its function is to introduce sperm into the vagina. It can alter its size and shape according to the amount of blood flowing through it. It usually stands erect when the male is sexually excited, to enable it to penetrate into the vagina for reproductive purpose.

Vas deferens

This is a tube that connects the epidermis with the urethra. Sperm is stored here.

Urethra

This is a tube that runs down the length of the penis from the urinary bladder through the prostate gland to an opening at the tip of the penis. Sperm travels down the urethra to be ejaculated.

The Prostate gland, Cowper's gland Seminal vesicles

They secrete substances which mix with the sperm to form the semen or seminal fluid. This fluid contains nutrients and other substances that activate the sperm and also provides a transport medium for it.

Generally, the male reproductive organ performs the following functions:

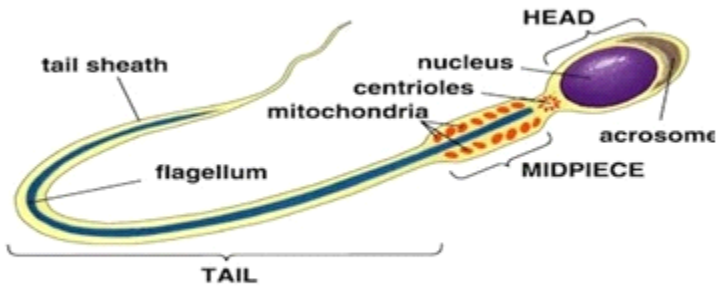
i. Production of male hormones (testosterone).

ii. Production and storage of sperm cells

iii. Introduction of sperm cells into the female reproductive tract to fertilize, the ovum (egg) for the formation of zygote that will grow into an embryo is a product of seminal sperm.

The Male Gamete (Spermatozoon)

The male gamete is called the spermatozoon (sperm). It has a flagellum-like tall. The head is mainly made up of nucleus and becomes motile when activated by fluids from the prostate gland and seminal vesicles.



A mature spermatozoon

Parts of the Female Reproductive System

The female reproductive organs are:

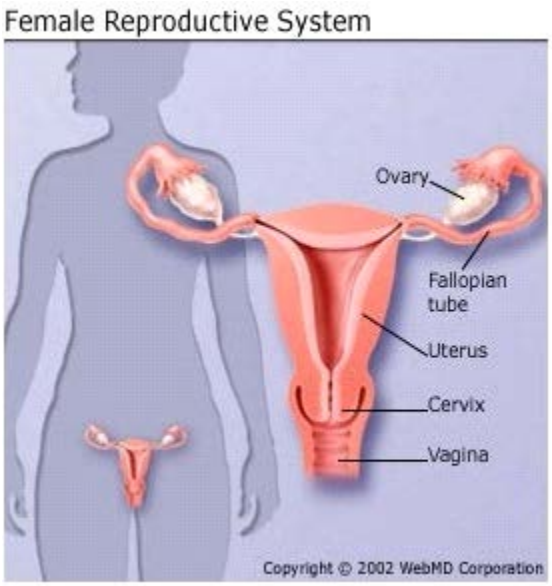
i. Ovaries

ii. Fallopian tube

iii. Uterus

iv. Vagina

v. Vulva



<u>Functions of the Female Reproductive Organs</u>

Ovaries

These are small, paired oval glands that lie on each side of the uterus and are held in place by ligaments. Ovaries release the egg or ovum every month from the onset of puberty. This process is known as ovulation. If the egg is fertilized by a sperm and the fertilized egg sticks to the wall of the uterus (implantation), the female is described as being pregnant at this stage, but if not fertilized, it is discharged or shed along the linning of the uterus as a mixture of mucus and blood in a process known as menstruation.

Fallopian Tube (Oviduct)

This is the tube leading from each ovary to the uterus (womb) through which the released egg passes. The fallopian tube is place where fertilization takes place.

Uterus (Womb)

This is situated in the lower abdomen. It lies behind the bladder and in front of the rectum. It is a hollow, thick-walled, muscular, and oval organ about 8cm long, and 5cm wide. The development of the foetus takes place in the uterus before delivery.

Vagina

This is an elastic muscular canal leading from the lower end of the uterus to the outside of the body. It is 9-13cm long. It is the copulatory organ of the female and also functions to receive sperm and as canal for birth. The opening of the vagina is partly covered by a membrane known as hymen. The vagina being very elastic stretches in order to allow easy passage of the baby during labour.

Vulva

This is the external part of the female reproductive organ which consists of the labia majora, labia minora and the clitoris which is an erectile organ like the penis. It becomes erect when the female is sexually stimulated.

Generally, the functions of the female reproductive organs are:

i. For fertilization

ii. For the production of the female reproductive cell (Ova)

iii. For feeding, nurturing and protecting the developing foetus

iv. For the production of the female sex hormones- oestrogen and progesterone that maintain the female monthly cycle

v. For pushing the baby out of the womb during delivery.

The Female Gamete (Ovum)

The female gamete is the ovum, (plural: oval) or the egg cell. It is large and spherical with a central nucleus and cytoplasm. These ova are produced in the ovaries. It is released by the ovary when the age of puberty is reached once every month. It contains yolk and nutrients

<u>Questions</u>

What happens when sexual intercourse results in fertilisation?

a. Disease occurs

b. Menstruation occurs

c. A child is born immediately

d. Pregnancy occurs

The fusion of the male and female gametes is called ____

a. Fertilisation

b. Ovulation

c. Menstruation

d. Pregnancy

One of the following is a female reproductive organ

a. Scrotum

b. Uterus

c. Urethra

d. Testes

One of the following is a male reproductive organ

a. Urethra

b. Uretus

c. Vulva

d. Ovum

____ is the process by which living things produce their kinds

Answers

1. D
2. A
3. B
4. A
5. Reproduction

JSS 1

BASIC SCIENCE

SECOND TERM

TABLE OF CONTENT

Week 1

Topic: Revision of Last Term's Work

Functions of Male Reproductive Organ

Generally, the male reproductive organ performs the following functions:

i. Production of male hormones (testosterone).

ii. Production and storage of sperm cells

iii. Introduction of sperm cells into the female reproductive tract to fertilize, the ovum (egg) for the formation of zygote that will grow into an embryo is a product of seminal sperm.

Functions of Female Reproductive Organs

Generally, the functions of the female reproductive organs are:

i. For fertilization

ii. For the production of the female reproductive cell (Ova)

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iv. For the production of the female sex hormones- oestrogen and progesterone that maintain the female monthly cycle

ASSESSMENT

Identify 2 functions of female reproductive organs

Week 2 & 3

Topic: Environmental Pollution

Introduction

The environment is the whole of our surrounding and it is made up of living and non-living components. The non-living components consist of water, air, land etc. The three non-living components are important for life on earth. The discharge of waste substances into the environment in quantities that are harmful to human beings is called POLLUTION. Pollution is the introduction of a contaminant into a natural environment, usually by humans. In other words, Pollution is the addition to the ecosystem of something which has a detrimental effect on it. One of the most important causes of pollution is the high rate of energy usage by modern, growing populations.

When some physical, chemical or biological changes occur in our physical environment it is known as pollution and the substances which brings these changes are known as Pollutants. The sources for the pollution can be natural or man made.

Different kinds of pollution are found, but we will discuss the following:

1. Air Pollution.
2. Water Pollution.
3. Land Pollution.

Air Pollution

Air pollution is the accumulation in the atmosphere of substances that, in sufficient concentrations, endanger human health or produce other measured effects on living matter and other materials. In other words, Air pollution is defined as any contamination of the atmosphere that disturbs the natural composition and chemistry of the air. This can be in the form of particulate matter such as dust or excessive gases like carbon dioxide or other vapours that cannot be effectively removed through natural cycles, such as the carbon cycle or the nitrogen cycle.

Among the major sources of pollution are power and heat generation, the burning of solid wastes, industrial processes, and, especially, transportation. The six major types of pollutants are carbon monoxide, hydrocarbons, nitrogen oxides, particulates, sulphur dioxide, and photochemical oxidants.

Air pollution comes from a wide variety of sources. Some of the most excessive sources include:

1. Vehicle or manufacturing exhaust
2. Forest fires, volcanic eruptions, dry soil erosion, and other natural sources
3. Building construction or demolition
4. Depending on the concentration of air pollutants, several effects can be noticed. Smog increases, higher rain acidity, crop depletion from inadequate oxygen, and higher rates of asthma. Many scientists believe that global warming is also related to increased air pollution.

Examples of Air Pollution

Noise Pollution

Noise pollution or unwanted sounds that are carried by the air, have an irritating and detrimental effect on humans and other animals. Careful planning of streets and buildings in towns and better control over noisy vehicles may add to the control of noise pollution.

Tobacco Smoke

Tobacco smoke is one of the major forms of pollution in buildings. It is not only the smoker who is infected, but everyone who inhales the polluted air. There is a very strong connection between smoking and lung cancer. Bronchitis is common among smokers and unborn babies of mothers who smoke also suffer from the harmful effects of smoking.

Exhaust Gases of Vehicles

Pollution from exhaust gases of vehicles is reponsible for 60% of all air pollution and in cities up to 80%. There is a large variety of harmful chemicals present in these gases, with lead being one of the most dangerous.

Combustion of Coal

The combustion of caol without special precautions can have serious consequences. If winds do not blow away the poisonous gases, they can have fatal effects and may lead to death.

Acid rain

Acid rain is the term for pollution caused when sulfur and nitrogen dioxides combine with atmospheric moisture to produce highly acidic rain, snow, hail, or fog. The acid eats into the stone, brick and metal articles and pollutes water sources. Coal in South Africa is rich in sulphur and the power stations in the Mpumalanga Province could be reponsible for acid rain over other areas of our country.

Control Measures

Although individual people can help to combat air pollution in their own immediate environment, efficient control can be best achieved by legislation. Some commonly enforced control measures include

The establishment of more smokeless zones;

Control over the kinds of fuel used in cars, aeroplanes, power stations, etc.

Water Pollution

Water pollution is the introduction into fresh or ocean waters of chemical, physical, or biological material that degrades the quality of the water and affects the organisms living in it. In other words, Water pollution involves any contaminated water, whether from chemical, particulate, or bacterial matter that degrades the water's quality and purity. Water pollution can occur in oceans, rivers, lakes, and underground reservoirs, and as different water sources flow together the pollution can spread.

This process ranges from simple addition of dissolved or suspended solids to discharge of the most insidious and persistent toxic pollutants (such as pesticides, heavy metals, and non-degradable, bioaccumulative, chemical compounds).

Causes of water pollution include:

Domestic waste substances include the following

1. Soap and detergents used in washing clothes, dishes and cars may flow back into the source of water supply such as lake, stream, river etc
2. Oil such as vegetable oil, kerosene, petrol from cars, palm oil, diesel from generator are spilled in the home or washed out from pots and maybe allowed to flow into the source of water supply
3. Refuse dumped beside river or stream may decay amd produce toxic materials which can be washed into the source of water supply
4. Dungs from animals, chickens, dog or cow left on land may decay and the poisonous material may be washed into the water source.

Other Sources of water pollutants generated from industries are

1. Acids eg hydrocyanic acid whic is present in water squeezed out from cassava
2. Soap and detergent used in washing industrial equipment may flow back to nearby water sources
3. Leaching of soil pollution into water supplies
4. Organic material decay in water supplies
5. Alcohol may be washed out from breweries

The effects of water pollution include decreasing the quantity of drinkable water available, lowering water supplies for crop irrigation, and impacting fish and wildlife populations that require water of a certain purity for survival.

Examples of Water Pollution

Industrial affluents

Water is discharged from after having been used in production processes. This waste water may contain acids, alkalis, salts, poisons, oils and in some cases harmful bacteria.

Mining and Agricultural Wastes

Mines, especially gold and coal mines, are responsible for large quantities of acid water. Agricultural pesticides, fertilizers and herbicides may wash into rivers and stagnant water bodies.

Sewage Disposal and Domestic Wastes

Sewage as well as domestic and farm wastes were often allowed to pollute rivers and dams.

Control Measures

The following measures can be used to stop water pollution:

1. Every intelligent people should be wise enough not to pollute water in any way;
2. By research and legislation the pollution of water bodies, even though not entirely prevented, must be effectively controlled.

Land Pollution

Land pollution is the degradation of the Earth's land surface through misuse of the soil by poor agricultural practices, mineral exploitation, industrial waste dumping, and indiscriminate disposal of urban wastes. It includes visible waste and litter as well as pollution of the soil itself.

Examples of Land Pollution

Soil Pollution

Soil pollution is mainly due to chemicals in herbicides (weed killers) and pesticides (poisons which kill insects and other invertebrate pests). Litter is waste material dumped in public places such as streets, parks, picnic areas, at bus stops and near shops.

Waste Disposal

The accumulation of waste threatens the health of people in residential areas. Waste decays, encourages household pests and turns urban areas into unsightly, dirty and unhealthy places to live in.

Control Measures

The following measures can be used to control land pollution:

1. anti-litter campaigns can educate people against littering;

2. organic waste can be dumped in places far from residential areas;

3. inorganic materials such as metals, glass and plastic, but also paper, can be reclaimed and recycled.

Ozone Layer Depletion: Effects and Causes of Ozone Depletion

The ozone layer is responsible for absorbing harmful ultraviolet rays, and preventing them from entering the Earth's atmosphere. However, various factors have led to the depletion and damage of this protective layer.

Ozone is a colourless gas found in the upper atmosphere of the Earth. It is formed when oxygen molecules absorb ultraviolet photons, and undergo a chemical reaction known as photo dissociation or photolysis. In this process, a single molecule of oxygen breaks down into two oxygen atoms. The free oxygen atom (O), then combines with an oxygen molecule (O2), and forms a molecule of ozone (O3). The ozone molecules, in turn absorb ultraviolet rays between 310 to 200 nm (nanometers) wavelength, and thereby prevent these harmful radiations from entering the Earth's atmosphere. The process of absorption of harmful radiation occurs when ozone molecules split up into a molecule of oxygen, and an oxygen atom. The oxygen atom (O), again combines with the oxygen molecule (O2) to regenerate an ozone (O3) molecule. Thus, the total amount of ozone is maintained by this continuous process of destruction, and regeneration.

Causes of Ozone Depletion

1. Ozone is a triatomic form of oxygen (O3), found in the Earth's atmosphere. A combination of low temperatures, elevated chlorine and bromine concentrations in the upper stratosphere are responsible for the destruction of ozone. The production and emission of chlorofluorocarbons (CFCs), is the leading cause of ozone layer depletion. CFC's accounts for almost 80% of the total depletion of ozone.

2. Other ozone-depleting substances (ODS), include hydrochlorofluorocarbons (HCFCs), and volatile organic compounds (VOCs). These are often found in vehicle emissions, byproducts of industrial processes, refrigerants, and aerosols. ODS are relatively stable in the lower atmosphere of the Earth, but in the stratosphere, they are exposed to ultraviolet radiation and thus, they break down to release a free chlorine atom.

3. This free chlorine atom reacts with an ozone molecule (O3), and forms chlorine monoxide (ClO), and a molecule of oxygen. Now, ClO reacts with an ozone molecule to form a chlorine atom, and two molecules of oxygen. The free chlorine molecule again reacts with ozone to form chlorine monoxide. The process continues, and this results in the depletion of the ozone layer.

Possible Effects of Ozone Depletion

As ozone depletes in the stratosphere, it forms a 'hole' in the layer. This hole enables harmful ultraviolet rays to enter the Earth's atmosphere. Ultraviolet rays of the Sun are associated with a number of health-related, and environmental issues.

Impact on Humans

Skin cancer: Exposure to ultraviolet rays poses an increased risk of developing several types of skin cancers, including malignant melanoma, basal and squamous cell carcinoma.

Eye damage: Direct exposure to UV radiations can result in photokeratitis (snow blindness), and cataracts.

Immune system damage: Effects of UV rays include impairment of the immune system. Increased exposure to UV rays weakens the response of the immune system.

Accelerated aging of skin: Constant exposure to UV radiation can cause photo allergy, which results in the outbreak of rash in fair-skinned people.

Other effects: Ozone chemicals can cause difficulty in breathing, chest pain, throat irritation, and hamper lung functioning.

Effects on Amphibians

Ozone depletion is listed as one of the causes for the declining numbers of amphibian species. Ozone depletion affects many species of amphibians at every stage of their life cycle.

Some of the effects are mentioned below:

Hampers growth and development in larvae

Changes behaviour and habits

Causes deformities in some species

Decreases immunity. Some species have become more vulnerable to diseases and death

Retinal damage and blindness in some species

Effects on Marine Ecosystems

In particular, plankton (phytoplankton and bacterioplankton) are threatened by increased UV radiation. Marine phytoplankton play a fundamental role in both the food chain as well as the oceanic carbon cycle. Plankton play an important role in converting atmospheric carbon dioxide into oxygen. Ultraviolet rays can influence the survival rates of these microscopic

organisms, by affecting their orientation and mobility. This eventually disturbs and affects the entire ecosystem.

Impact on Plants

In some species of plants, UV radiation can alter the time of flowering, as well as the number of flowers.

Plant growth can be directly affected by UV-B radiation. Despite mechanisms to reduce or repair these effects, physiological and developmental processes of plants are affected.

Another observation is an increase in the ozone present in the lower atmosphere due to the decrease in the ozone in the stratosphere. Ozone present in the lower atmosphere is mainly regarded as a pollutant and a greenhouse gas, that can contribute to global warming and climate change. However, studies have pointed out that the lifespan of lower atmospheric ozone is quite less, compared to stratospheric ozone. At the same time, increase in the level of ozone in the lower atmosphere can enhance the ability of sunlight to synthesize vitamin D, which can be regarded as an important beneficial effect of ozone layer depletion.

Practice Questions

Pollution is the introduction of a _____ into a natural environment, usually by humans.

a) contamination

b) contaminant

c) pollutes

d) dirts

Ozone is a _____ form of oxygen (O3), found in the Earth's atmosphere

a) diatomic

b) monoatomic

c) triatomic

d) hexatomic

One of the following is not a cause of water pollution

a) Increased sediment from soil erosion

b) smoke from chimney

c) Improper waste disposal and littering

d) Leaching of soil pollution into water supplies

One of the following is not an impact of ozone depletion on humans

a) hampering of growth

b) skin cancer

c) eye damage

d) aging of skin

As ozone depletes in the stratosphere, it forms a _____ in the layer

a) hole

b) space

c) base

d) line

One of the following is not a cause of air pollution.

a) Exhaust Gases of Vehicles

b) Smoke from chimney

c) Acid rain

d) Sewage

_____ are unwanted sounds that are carried by the air, have an irritating and detrimental effect on humans and other animals.

a) air pollution

b) pollutants

c) smoke

d) noise pollution

One of the following is not a control measure for pollution

a) anti-litter campaigns can educate people against littering

b) organic waste can be dumped in places far from residential areas

c) littering of the streets with dirts

d) inorganic materials such as metals, glass and plastic, but also paper, can be reclaimed and recycled.

_____ is the degradation of the Earth's land surface through misuse of the soil by poor agricultural practices, mineral exploitation, industrial waste dumping, and indiscriminate disposal of urban wastes.

a) Land pollution

b) Soil pollution

c) Water disposal

d) Air pollution

_____ is the introduction into fresh or ocean waters of chemical, physical, or biological material that degrades the quality of the water and affects the organisms living in it.

a) Rain pollution

b) Sea pollution

c) Water pollution

d) Pollution

Answers

1. B
2. C
3. B
4. A
5. A
6. D
7. D
8. C
9. A
10. B

Week 4

Topic: Sexually Transmitted Infections

Introduction

It is not all diseases that are air-borne, water-borne or soil-borne. Some are transmitted through sexual intercourse. These diseases are known as venereal diseases. The common venereal diseases are gonorrhea, syphilis and HIV/AIDS. These diseases are always chronic, affecting and damaging the organs and systems and eventually leading to death in most cases.

Definition of STIs, HIV/AIDS

STIs: This means Sexually Transmitted Infections. Sexually Transmitted Diseases are infections that can be spread from one person to another through sexual intercourse with another infected person. These are diseases transmitted through sexual intercourse with an infected person. Examples of STIs are syphilis, gonorrhea, etc.

HIV: This means Human Immunodeficiency Virus. It is a simple living virus that causes AIDS in humans.

AIDS: This means Acquired Immune Deficiency Syndrome. AIDS is an illness that attacks and breaks down the body's immune system and exposes the individual to infections and may usually lead to death.

Some people do not know they have STI because they may not have painful signs, while some other who know withhold this information from their sexual partners because they are ashamed to own it up.

Major Sources of STI Transmissions

You can get an STI by having intimate sexual contact with someone who already has the infection. You can't tell if a person is infected because many STIs have no symptoms. But STIs can still be passed from person to person even if there are no symptoms. STIs are spread during vaginal, anal, or oral sex or during genital touching. So it's possible to get some STIs without having intercourse. Not all STIs are spread the same way.

Signs and Symptoms of STI

Many STIs have only mild or no symptoms at all. When symptoms do develop, they often are mistaken for something else, such as urinary tract infection or yeast infection. This is why screening for STIs is so important. The STIs listed here are among the most common or harmful to women.

Symptoms of sexually transmitted infections

Bacterial vaginosis (BV)

STI Symptoms

Most women have no symptoms. Women with symptoms may have:

- Vaginal itching
- Pain when urinating
- Discharge with a fishy odour

Chlamydia – causative organism is a bacterium called Chlamydia trachomatis

STI Symptoms

Most women have no symptoms. Women with symptoms may have:

- Abnormal vaginal discharge
- Burning when urinating
- Bleeding between periods

Infections that are not treated, even if there are no symptoms, can lead to:

- Lower abdominal pain
- Low back pain
- Nausea
- Fever
- Pain during sex

Genital herpes

STI Symptoms

Some people may have no symptoms. During an "outbreak," the symptoms are clear:

Small red bumps, blisters, or open sores where the virus entered the body, such as on the penis, vagina, or mouth

- Vaginal discharge
- Fever

- Headache
- Muscle aches
- Pain when urinating
- Itching, burning, or swollen glands in genital area
- Pain in legs, buttocks, or genital area

Symptoms may go away and then come back. Sores heal after 2 to 4 weeks.

Gonorrhea – causative organism is a bacterium called Neiseria gonorrhoeae

STI Symptoms

Symptoms are often mild, but most women have no symptoms. If symptoms are present, they most often appear within 10 days of becoming infected. Symptoms are:

- Pain or burning when urinating
- Yellowish and sometimes bloody vaginal discharge
- Bleeding between periods
- Pain during sex
- Heavy bleeding during periods

Infection that occurs in the throat, eye, or anus also might have symptoms in these parts of the body.

Hepatitis B

STI Symptoms

Some women have no symptoms. Women with symptoms may have:

- Low-grade fever
- Headache and muscle aches
- Tiredness
- Loss of appetite

- Upset stomach or vomiting
- Diarrhea
- Dark-colored urine and pale bowel movements
- Stomach pain
- Skin and whites of eyes turning yellow

AIDS – causative organism is human immunodeficieny virus

STI Symptoms

Some women may have no symptoms for 10 years or more. About half of people with HIV get flu-like symptoms about 3 to 6 weeks after becoming infected. Symptoms people can have for months or even years before the onset of AIDS include:

- Fevers and night sweats
- Feeling very tired
- Quick weight loss
- Headache
- Enlarged lymph nodes
- Diarrhea, vomiting, and upset stomach
- Mouth, genital, or anal sores
- Dry cough
- Rash or flaky skin
- Short-term memory loss

Women also might have these signs of HIV:

- Vaginal yeast infections and other vaginal infections, including STIs
- Pelvic inflammatory disease (PID) that does not get better with treatment
- Menstrual cycle changes

Human papillomavirus (HPV)

STI Symptoms

Some women have no symptoms. Women with symptoms may have:

- Visible warts in the genital area, including the thighs. Warts can be raised or flat, alone or in groups, small or large, and sometimes they are cauliflower-shaped.
- Growths on the cervix and vagina that are often invisible.

Pubic lice

STI Symptoms

(sometimes called “crabs”) Symptoms include:

- Itching in the genital area
- Finding lice or lice eggs

Syphilis – causative organisam is a bacterium called Treponema pallidum

STI Symptoms

Syphilis progresses in stages. Symptoms of the primary stage are:

- A single, painless sore appearing 10 to 90 days after infection. It can appear in the genital area, mouth, or other parts of the body. The sore goes away on its own.

If the infection is not treated, it moves to the secondary stage. This stage starts 3 to 6 weeks after the sore appears. Symptoms of the secondary stage are:

- Skin rash with rough, red or reddish-brown spots on the hands and feet that usually does not itch and clears on its own
- Fever
- Sore throat and swollen glands
- Patchy hair loss
- Headaches and muscle aches
- Weight loss
- Tiredness

In the latent stage, symptoms go away, but can come back. Without treatment, the infection may or may not move to the late stage. In the late stage, symptoms are related to damage to internal organs, such as the brain, nerves, eyes, heart, blood vessels, liver, bones, and joints. Some people may die.

Trichomoniasis

STI Symptoms

(sometimes called “trich”)

Many women do not have symptoms. Symptoms usually appear 5 to 28 days after exposure and can include:

- Yellow, green, or gray vaginal discharge (often foamy) with a strong odor
- Discomfort during sex and when urinating
- Itching or discomfort in the genital area
- Lower abdominal pain (rarely)

Preventive Methods

The preventive measures for the spread of STIs include:

1. **Use of Condom:** This protects one from contracting sexually transmitted diseases
2. **Abstinence:** This means totally avoiding sexual intercourse. This can be achieved through strict discipline and self control
3. **Responsible Sexual Behaviour:** This involves being faithful to one’s partner in a sexual relationship.
4. **Proper screening of blood**, injection with unsterilized needles and cutting hair with sterilized clippers: It is safer if an individual has his or her own hair clippers. If this is not possible, one should ensure that the barber sterilizes his or her clippers properly before use.
5. **Enlightenment campaign** through posters, public lectures, jingles or radio and television
6. **Age maturity** before engaging in sex: This is the ability of the individual (boy or girl) to be mentally, physically and emotionally mature before engaging in sexual activities.

Consequences of Irresponsible Sexual Behaviour

1. Contracting venereal diseases e.g. STIs, HIV/AIDS
2. Unwanted pregnancies/early marriage
3. Rejection by the society
4. Abortion/death

Questions

Which of the following is a sexually transmitted infection?

a. Malaria

b. Syphilis

c. Cholera

d. Tuberculosis

Which of the following statements is false

a. Some diseases are transmitted throug sexual intercourse

b. Syphilis is caused by a bacterium

c. A virus is a microscopic animal

d. Patients of sexually transmitted infections are ashamed to tell anyone

Sexually transmitted diseases can be reduced by

a. health education

b. avoiding many sexual partners

c. use of condom

d. all of the above

What is the causative organism for Syphilis?

a. Treponema pallidum

b. Neiseria gonorrhoeae

c. Chlamydia trachomatis

d. Bacterial vaginosis

One of the following is not a consequence of irresponsible social behaviour

a. Contracting venereal diseases

b. Unwanted pregnancies

c. Malaria infection

d. Rejection by the society

Answers

1. B
2. C
3. D
4. A
5. C

Week 5

Topic: HIV/AIDS

Contents:

- Meaning of HIV/AIDS
- Mode of Transmission
- Causes of HIV
- Prevention of HIV

Meaning of HIV/AIDS

The first recognized cases of AIDS occurred in the USA in the early 1980s. HIV is a lentivirus, and like all viruses of this type, it attacks the immune system. Lentiviruses are in turn part of a larger group of viruses known as retroviruses. The name 'lentivirus' literally means 'slow virus' because they take such a long time to produce any adverse effects in the body. They have been found in a number of different animals, including cats, sheep, horses and cattle.

The Human Immunodeficiency Virus (HIV) is a retrovirus that infects cells of the immune system, destroying or impairing their function. In other words, HIV is a virus that weakens the body's immune system, which is the body's defense system. As the infection progresses, the immune system becomes weaker, and the person becomes more susceptible to infections.

The most advanced stage of HIV infection is acquired immunodeficiency syndrome (AIDS). It can take 10-15 years for an HIV-infected person to develop AIDS; however, antiretroviral drugs can slow down the process even further.

HIV is transmitted through unprotected sexual intercourse (anal or vaginal), transfusion of contaminated blood, sharing of contaminated needles, and between a mother and her infant during pregnancy, childbirth and breastfeeding.

HIV means Human Immune-deficiency Virus and AIDS means Acquired Immune Deficiency Syndrome. HIV is the VIRUS while AIDS is the DISEASE.

AIDS is a disease of the human system caused by HIV damaging one's immune system

HIV interferes with the body's ability to fight the organisms that cause disease. HIV is a sexually-transmitted infection. It can be spread by contact with infected blood or from mother to child during pregnancy.

Causes of HIV/AIDS

A person can be infected with HIV/AIDS through the following ways

1. From mother to child: A mother who is infected with HIV can infect their babies during pregnancy, child birth or through breast feeding. Treatment of HIV infection during pregnancy, the risk of transferring it to their babies is reduced.
2. Sharing contaminated sharp objects: Another means by which HIV can be transmitted is through sharp objects like clippers, needles, razor etc that are contaminated with infected people.
3. During sexual act: unprotected sex with someone already infected with HIV has accounted for greater number of cases of HIV infection worldwide.
4. Blood Transfusion: HIV can spread through blood transfusion i.e the transfer of blood from one person to another.

HIV may be passed from one person to another by:

1. More common

Having sex (vaginal, anal, or oral) with a person who has HIV

Sharing needles with someone who has HIV, such as when using drugs

Pregnancy, labour, birth, or breastfeeding if a mother has HIV

2. Less common

Blood transfusion from an HIV positive blood donor, which is very unlikely today because blood banks test donated blood for HIV

Eating food that has been pre-chewed by an HIV-infected person. The blood in a caregiver's mouth can mix with food while chewing. This is rare and has only been noted among infants whose HIV positive caregiver gave them pre-chewed food.

Using a dirty tattooing needle (if it was used before on someone with HIV). Make sure the needle is new.

Sharing a toothbrush or razor with someone who has HIV

HIV is not spread through:

• Kissing (there is a small chance of getting HIV from open-mouthed or "French" kissing except there's contact with blood)

• Touching, hugging, or handshakes

• Sharing food or drinks

• Sharing food utensils, towels and bedding, telephones, or toilet seats

• Donating blood

• Working with or being around someone with HIV

• Biting insects, such as mosquitoes

• Swimming pools or drinking fountains

• Playing sports

Symptoms of HIV/AIDS

Many people have no symptoms when they first get HIV. Some have no symptoms for years. It varies from person to person. But some people get a flu-like illness within a month or two after first getting HIV. It's important to remember that HIV is active inside your body, even when you don't have symptoms. As HIV spreads in your body, you'll start to feel sick. For many people, the first symptom they notice is large lymph nodes (swollen glands) that last for more than three months. Symptoms of HIV include:

1. Diarrhea, vomiting, and nausea
2. Being very tired (fatigue)
3. Mouth, genital, or anal sores
4. Dry cough
5. Quick weight loss
6. Headache
7. Rash or flaky skin
8. Fevers and night sweats
9. Short-term memory loss
10. Anaemia
11. Fever
12. Tuberculosis
13. Nausea

Test and Exercises

The first recognized cases of HIV/AIDS was first discovered in

(a) early 1980s

(b) lately 1980s

(c) early1990s

(d) lately 1990s

Symptoms of HIV/AIDS are the following except

(a) chronic cough

(b) memory loss

(c) nausea

(d) eye problem

HIV means

(a) Human Innovative Virus

(b) Human Immune Virus

(c) Human immune-deficiency Syndrome

(d) Human Individual Visual

An individual can be infected with HIV/AIDS with the following ways except

(a) blood transfusion

(b) during sexual act

(c) keeping to one spouse

(d) from mother to child

AIDS means

(a) Acquired Immune Deficiency Syndrome

(b) Acquired Innovation for Deficiency Syndrome

(c) Acquired Immune Diseases Syndrome

(d) Applied Immune Deficiency Syndrome

Answers

1. A
2. D
3. C
4. C
5. A

Week 6

Topic: HIV/AIDS (II)

Contents:

Test for HIV

You cannot rely on symptoms to know whether you have HIV. If you have symptoms, they may be caused by something else. And many people infected with HIV have no symptoms for many years. The only way to know whether you have HIV is to get a test.

Effects of HIV/AIDS

HIV/AIDS has the following effect on the infected people

1. HIV/AIDS make victims very uncomfortable and ill because they are always prone to various diseases
2. HIV/AIDS victims suffer psychologically because they are always pessimistic and live in fear.
3. HIV/AIDS increased dependency ratio
4. People die of the disease
5. HIV/AIDS lead to increase level of poverty as victims of the disease spend much money on hospital bills to keep themselves alive
6. It leads to broken homes, spouses may decide to divorce each other after realizing one of the partner has been infected with HIV/AIDS
7. It leads to reduction of population in the country since many of the victims die
8. Reduction in manpower

Preventive Measures of HIV/AIDS

- HIV prevention refers to practices done to prevent the spread of HIV/AIDS. HIV prevention practices may be done by individuals to protect their own health and the health of those in their community, or may be instituted by governments or other organizations as public health policies. The following are some main ways of preventing the spread of HIV in our community and country. These way often called 'ABC' which is summarized thus;

- It stands for complete ABSTINENCE meaning do not engage in sexual act till one is married.

- It stands for be faithful to one partner especially those that are married and in relationship.

- It stands for using condoms. This does not mean that sex is recommended for an unmarried person, it is meant for married people to safeguard unwanted pregnancy and for those who cannot abstain from having sex.

Anybody can get HIV, but you can take steps to protect yourself from HIV infection.

• Don't have sex: Abstinence (not having sex of any kind) is the surest way to avoid HIV infection through sexual contact.

• If you must have sex, get tested and know your partner's HIV status: Talk to your partner about HIV testing and get tested before you have sex.

• Be faithful to your partner: If you and your partner are both HIV negative and have sex only with each other, you are not at risk of HIV infection through sexual contact.

• Use condoms: Use a condom every time you have vaginal, anal, or oral sex.

• Limit your number of sexual partners: If you have more than one sexual partner, get tested for HIV regularly. Get tested and treated for sexually transmitted infections (STIs), and insist that your partners do, too. Having an STI can increase your risk of becoming infected with HIV.

• Don't inject drugs: But if you do, use only clean needles and equipment and don't share your equipment with others.

How to Care for people with HIV/AIDS

1. Showing love, respect and support
2. Knowing the facts about HIV/AIDS and talking openly about the disease
3. Helping to reduce stress and stressful situations

4. Helping to provide balanced and nutritious meals
5. Encouraging them to get treatment if they are sick. Most infections are easily treated and cured, even if a person is HIV positive
6. They should not be rejected in the society

Management of HIV (Use of Anti-Retro Viral Drugs)

Once HIV infection is diagnosed, a person has a life-long condition which will go through several stages and has many consequences. The disease needs to be managed by people with HIV themselves as well as their healthcare providers.

An overview of the needs of a person with HIV infection (not necessarily in order of priority) is as follows:

1. Education / information – learning how to best take care of yourself, staying informed about new treatments or approaches

2. Maintaining general health – self care, nutrition

3. Financial planning – medical aid, future provision for self and dependents

4. Monitoring HIV disease – regular medical check-ups, monitoring tests

5. Preventing opportunistic disease – avoiding exposure, alertness to early signs of disease, prophylactic medication

6. Psychological health – informing others, dealing with stigma, spiritual support, managing anxiety and depression

7. Sexual and reproductive – safer sex for partners and self, whether to have a baby, avoiding infection of the baby

8. Antiretroviral treatment: Standard antiretroviral therapy (ART) consists of the combination of at least three antiretroviral (ARV) drugs to maximally suppress the HIV virus and stop the progression of HIV disease. Huge reductions have been seen in rates of death and suffering when use is made of a potent ARV regimen, particularly in early stages of the disease.

9. Terminal care – care and treatment during the final stages of the disease.

Stigmatization of People living with HIV/AIDS

HIV stigmatization is the discrimination and negative attitudes of people in the society towards people living with HIV/AIDS

Victims of HIV/AIDS are stigmatized in various ways, which are:

- People living with victims of HIV/AIDS are rejected by family members and friends
- Most of them are sacked from their employment
- They are avoided and rejected by members of the society
- They are discriminated in the society
- People living with victims of HIV/AIDS mocked them because of the diseases

Meaning of HIV/AIDS Stigmatisation

HIV-related stigma and discrimination refers to prejudice, negative attitudes and abuse directed at people living with HIV and AIDS. In 35% of countries with available data, over 50% of men and women report having discriminatory attitudes towards people living with HIV.

The consequences of stigma and discrimination are wide-ranging. Some people are shunned by family, peers and the wider community, while others face poor treatment in healthcare and educational settings, erosion of their rights, and psychological damage. These all limit access to HIV testing, treatment and other HIV services.

The People Living with HIV Stigma Index indicates that roughly one in every eight people living with HIV is being denied health services because of stigma and discrimination.

Myths about HIV/AIDS

1. I can get HIV by being around people who are HIV-positive: The evidence shows that HIV is not spread through touch, tears, sweat, or saliva.

You cannot catch HIV by:

• Breathing the same air as someone who is HIV-positive

• Touching a toilet seat or doorknob handle after an HIV-positive person

• Drinking from a water fountain

• Hugging, kissing, or shaking hands with someone who is HIV-positive

• Sharing eating utensils with an HIV-positive person

• Using exercise equipment at a gym

2. I don't need to worry about becoming HIV positive, new drugs will keep me well: Yes, antiretroviral drugs are improving and extending the lives of many people who are HIV-positive. However, many of these drugs have serious side effects. None yet provides a cure. Also, drug-resistant strains of HIV make treatment an increasing challenge.

3. I can get HIV from mosquitoes: Because HIV is spread through blood, people have worried that biting or bloodsucking insects might spread HIV. Several studies, however, show no evidence to support this even in areas with lots of mosquitoes and cases of HIV. When insects bite, they do not inject the blood of the person or animal they have last bitten. Also, HIV lives for only a short time inside an insect.

4. I'm HIV-positive, my life is over: In the early years of the disease epidemic, the death rate from AIDS was extremely high. But today, antiretroviral drugs allow HIV-positive people — and even those with AIDS — to live much longer, normal, and productive lives.

5. I'm straight and don't use HIV drugs, I won't become HIV-positive: Most men do become HIV-positive through sexual contact with other men or through injection drug use. However, about 16% of men and 78% of women become HIV-positive through heterosexual contact.

6. If I'm receiving treatment, I can't spread the HIV virus: When HIV treatments work well, they can reduce the amount of virus in your blood to a level so low that it doesn't show up in blood tests. Research shows, however, that the virus is still "hiding" in other areas of the body. It is still essential to practice safe sex so you won't make someone else become HIV-positive.

Questions

The 'ABC' of HIV/AIDS prevention is

(a) abstinence, faithfulness to one partner, use of condoms

(b) abstinence, unfaithfulness, use of condoms

(c) not abstaining from sex, faithfulness, use of condoms,

(d) abstinence, faithfulness, having unsafe sex

One of these is not a way of taking care of people with HIV/AIDS

(a) knowing the facts about HIV/AIDS and talking openly about the disease

(b) helping to reduce stress and stressful situations

(c) helping to provide balanced and nutritious meals

(d) running away from people with the disease

HIV/AIDS stigmatization means

(a) having friendly attitude towards people leaving with HIV

(b) encouraging people with the disease

(c) providing care for people with HIV

(d) having discriminatory attitudes towards people living with HIV

The following are examples of stigmatization faced by people living with HID/AIDS except

(a) prejudice

(b) negative attitudes

(c) love

(d) abuse

Abstinence means

(a) engaging with multiple sexual partners

(b) engaging in sexual acts on a regular basis

(c) not engage in sexual act till one is married

(d) unfaithfulness after one is married

Answers

1. A
2. D
3. D
4. C
5. C

Week 7 & 8

Topic: Energy

Introduction

Energy is a science concept that has become a common vocabulary of everyday speech by both adults and children.

Meaning of Energy

Energy may be said to mean ability to do work. It is the capacity to do work. Therefore, a man, an object or a thing may be said to have energy if it possesses the ability to do work. This also implies that to do work, something or somebody must have energy. A bicycle, a train, a bulldozer cannot work unless it has energy. You cannot walk, run or eat or go to school unless you have energy.

Sources of Energy

The food we eat supplies us with energy for physical and mental activities. However, you will observe that human labour cannot achieve much in lifting a heavy load as cranes can do. Therefore, man has found that there are other sources of energy, which he can use to do work more successfully. These other forms of energy may come from:

A. Natural sources of Energy

1. **Coal:** This is formed from dead plant materials which have been subjected to heat over the years. The energy in coal came originally from the sun. This may be used to produce coal fire, which is used in driving locomotive trains, in metal smelting and in cooking.
2. **Food:** The food we eat contains energy. The energy in food is part of the energy from green plants. When food is broken down in the cells inside our bodies, the energy in the food is released.
3. **Sunlight:** The sun is a heavenly body in the sky. The sun gives the radiant energy made up of both light and heat. It is used for seeing, drying of clothes and other things, powering of solar cells. The sun is the primary source of energy
4. **Wood:** This energy is part of the energy the green plant received from the sun. When wood burns, it releases energy.
5. **Natural Gas:** Natural gas occurs together with petroleum under the ground or water. When it burns, it produces so much heat.
6. **Moving air (Wind):** Moving air has so much energy which can be used to turn

engines that do various kinds of work such as electricity production, grinding of grains.

7. **Water:** Moving water or water that falls from a height has energy that can do work. A dam is a wall built across a stream or river. This wall makes water build up on the side of the wall towards the source of the river.

Artificial Sources of Energy

1. **Electric Generators** – Artificial machines that produce energy
2. **Batteries** – They store electricity. Some can be recharged.
3. **Petroleum Products**

Forms of Energy

Energy has different forms and that is the reason why it can enable us to do different types of work. For example, a coiled spring possesses a type of energy called potential energy. That is why the coiled spring could be used in shutting doors e.g. trapdoor. It could also be used to hold open some car booths

Another type of energy is kinetic energy. Kinetic energy is the energy possessed by a moving object as a result of the motion. A fast moving vehicle that collides with a building damages the building because it has a high kinetic energy

When put fresh batteries into a torchlight and switch it on, you will observe the generation of light. Light is a form of energy. It can help us to see things in darkness.

1. **Heat Energy** – This is used to cook food, iron clothes, boil water to produce steam which operates stream engines.
2. **Light Energy** – Can deflect the pointer of a light meter. Plants use light energy to make their food.
3. **Sound Energy** – It enables us to hear sound of different kinds such as human speech, radio and television sounds.
4. **Electrical Energy** – It can deflect the pointer of a voltmeter. It can give you electric shock. It is used to operate electric fans, radio sets, refrigerators and television sets.
5. **Chemical Energy** – This is energy contained in chemical substances such as food, candle and petrol.
6. Mechanical Energy – This is a form of energy which a body possesses by virtue of its position or its movement. There are two forms of mechanical energy; potential and kinetic energy. Potential energy is the energy a body has by virtue of its

position while kinetic energy is the energy of motion of a body.

Transfer of Energy

Energy can move from one place to another or from one body to another body or from one medium to another. Such a movement is described as the transfer of energy. For example, heat can flow from a pot of hot water to the air around the pot. The phenomenon is called heat transfer.

Heat transfer can occur in three ways called conduction, convection or radiation.

Light energy can be transferred by the process of radiation and by reflection, refraction and diffraction.

Mirrors are used to reflect light. Lenses refract light and can be used to form images of objects on a screen such as in photographic cameras.

Some Examples of Energy Transfer

1. For a pot of water heated by fire. The heat of the fire passes through the pot by conduction and enters the water.
2. When you strike a match and the stick lights up, the frictional energy of rubbing ignites the matches. During the burning process, chemical energy is changed into heat and light energy
3. When you kick a ball, potential energy that is stored in the muscle of the leg is converted into kinetic energy in the ball, which moves out with speed
4. Falling fruit: In this case, the potential energy stored in the fruit on the top of the tree is converted to kinetic energy in the falling fruit.

Uses of Energy

There are many uses of energy. The use of energy depends on the type or form of the energy. For example, heat energy can be used to cook food, generate steam for steam engines and kill germs on tools and consumable items.

1. Light energy can be used for seeing in the dark, for producing images such as in photographs or films, or for sending signals
2. Sound energy can be used in producing music
3. Electrical energy can be used in driving machines, in producing light, etc.
4. Potential energy as in waterfalls or dams may be used in producing hydro-electricity.

Questions

Which of the following is not a source of Energy?

a. Coal

b. Wood

c. Smoke

d. Natural gas

Which of the follwoing is a form of energy

a. Wind

b. Radio

c. Water

d. Sun

Energy is the capacity to

a. cause movement

b. do work

c. light an electric work

d. operate appliances

_____ is the energy a body has by virtue of its position

a. Kinetic energy

b. Magnetic energy

c. Chemical energy

d. Potential energy

_____ energy is used to cook food , iron clothes and boil water

a. Heat

b. Electrical

c. Chemical

d. Light

Answers

1. C
2. B
3. B
4. D
5. A

Week 9

Topic: RENEWABLE AND NON-RENEWABLE ENEGRY

Introduction

There is a new issue becoming popular in the society nowadays and that is whether the energy we are using can be easily replenished by nature or not. This issue has made people to be conscious of what they do with available energy supply. The consciousness arises from imagining what the world would be like without energy.

Meaning

There are some forms of energy that can be replenished after use and there are some that cannot except one pays for it. The form of energy that can be replenished naturally after use is referred to as the renewable energy.

Renewable energy is an energy source that can be replenished within a short period of time. Renewable energy is also defined as “energy” derived from resources that are regenerative or which for all practical purposes cannot be depleted. It is also a kind of energy that can be restored to its original position. Renewable resources are those that can be used or made over and over again from other resources – they are unlimited

Examples of Renewable Energy

Renewable energy sources include, solar energy, which comes from the sun and which can be turned into electricity and heat, wind, geothermal energy from inside the earth, biomass from plants, and hydropower and ocean energy from water are also renewable energy sources. Each of these sources has unique characteristics which influence how and where they are used.

Solar Energy

The solar panels (photovoltaic arrays) can charge the 12V batteries up to 9 amperes in full, direct sunlight. Most fossil and renewable energy sources are ultimately derived from “solar energy”. Thereby, some ascribe much broader meanings to the term.

Solar Renewable Energy

The majority of renewable energy technologies are directly or indirectly powered by the sun. The Earth-Atmosphere system is in equilibrium such that heat radiation into space is equal to incoming solar radiation. The resulting level of energy within the Earth-Atmosphere system

can roughly be described as the Earth's "climate".

The hydrosphere (water) absorbs a major fraction of the incoming radiation. Most radiation is absorbed at low latitudes around the equator, but this energy is dissipated around the globe in the form of winds and ocean currents. Wave motion may play a role in the process of transferring mechanical energy between the atmosphere and the ocean through wind stress. Solar energy is also responsible for the distribution of precipitation which is tapped by hydroelectric projects, and for the growth of plants used to create biofuels.

Wind Renewable Energy

Kinetic energy in airflows can be used to run wind turbines, some are capable of producing 5MW of power, turbines with rated output of 1.5 – 3MW have become the most common for commercial use. The power output of a turbine is a function of the cube of the wind speed. Therefore, a so high-power output can be achieved as wind speed increases. Wind power is renewable and produces no Greenhouse gases during operation, such as carbon dioxide and methane

Water Renewable Energy

Energy in water (in the form of motive energy or temperature differences) can be harnessed and used. Since water is about a thousand times denser than air, even a slow flowing stream of water, or moderate sea well, can yield considerable amounts of energy.

There are many form of water energy: Hydroelectric energy is a term usually reserved for hydroelectric dams and waterfalls. Tidal power captures energy from the tides in a vertical direction. Tides come in, raise water levels in a basin, and tides roll out. Around low tide, the water in the basin is discharged through a turbine.

Tidal stream power captures energy from the flow of tides, usually using an underwater plant resembling a small wind turbine.

Bio-fuel Renewable Energy

Bio-fuel is any fuel derived from biomass, including living organisms or their metabolic by-products, such as cow manure. Plants use photosynthesis to grow and produce biomass. Other organisms may be grown to produce biomass. Also known as biomatter, biomass can be used directly as fuel or to produce liquid biofuel.

Non-Renewable Energy

Meaning

The form of energy that cannot be replenished naturally after use is referred to as non-renewable energy. This is an energy source that we use up and cannot recreate in a short period of time. Energy from non-renewable resources cannot be re-created over again and our supply of them is limited; once they run out, the resource is gone forever.

Examples of Non-Renewable Energy

Coal is an example of a non-renewable resource because there is only a fixed amount of it on earth. Once we have mined all the coal, there would be no more coal to mine for future use. It will take generations for nature to produce another deposit of coal for man.

For example when you exercise yourself e.g. by playing football, lawn tennis, table tennis, etc. or do some household chores like washing, sweeping, grinding, pounding, dusting, etc., you soon get tired because you have used up energy. You are not likely to do any activity until you find a way of replenishing your energy. You may get back your energy when you rest and eat some amount of food like yam, amala, tuwo, garri, akpu, pounded yam and rice.

Non-renewable energy sources come out of the ground as liquids, gases and solids. Right now, crude oil (petroleum) is the only naturally liquid commercial fossil fuel. Natural gas and propane are normally gases, and coal is a solid. Coal, petroleum, natural gas and propane are all considered fossil fuels because they are formed from the buried remains of plants and animals that lived millions of years ago.

Uses of Renewable Energy

Renewable energy is useful in the following ways:

- Solar energy can be used to generate electricity using photovoltaic solar cells
- Solar energy can be used to generate electricity using concentrated solar power
- Solar energy can be used to generate electricity by heating trapped air which rotates turbines in a solar updraft tower
- Solar energy can be used to heat buildings during cold (harmattan), directly.
- Solar energy can be used to heat foodstuffs, through solar ovens
- Solar energy can be used to heat water or air for domestic hot water and space heating needs using solar-thermal panels
- Solar energy can be used to heat and cool air through the use of solar chimneys
- Solar energy can be used to generate electricity using Space Solar Power Satellite in geostationary orbit and beamed down via microwaves

Uses of Non-Renewable Energy

- The food you eat contains chemical energy, and your body stores this energy (potential energy) until you release it when you work or play (kinetic energy)
- Conversion of crude oil

Misuse of Renewable Energy

- Renewable energy can be used in the production of nuclear weapons
- High wind or water current with such amount of renewable energy has been reported to kill people (Tsunamis)
- Overloading of the hydroelectric power stations

Misuse of Non-Renewable Energy

- Fuels like ethanol are volatile and are highly inflammable; its storage in homes has caused fire incidences
- Some people use petrol for argons
- Felling most of the trees in the forest for cooking.

Questions

Renewable energy is one that

a. burns easily

b. can easily be imported

c. produces much heat

d. can be restored to its original position

Which of the following is a renewable energy?

a. Sun

b. Coal

c. Crude oil

d. Natural gas

Which of the following is a renewable energy?

a. Wood

b. Wind

c. Petrol

d. Coal

____ in airflows can be used to run wind turbines

a. Potential energy

b. Kinetic energy

c. Chemical energy

d. Magnetic energy

Answers

1. D
2. A
3. B
4. B

Week 10

Topic: Energy and Society

Introduction

We have many uses of energy both in the home and at work. Lack of energy will mean that most of the activities we should have done with ease will be difficult to do.

We may not be able to do some such activities. Some of the things we can do with energy are shown in the below

<table>

Uses	**Appliances**
Boiling water	➢ Immersion heater
Keeping the room cool	➢ Air conditioner
Producing light for seeing in the dark	➢ Candle or rechargeable lamp
Cooking food and boiling water	➢ Electric cooker
Keeping food and drinks fresh and cool respectively	➢ Refrigerator
Viewing news broadcasts, entertainment, advertisements and education	➢ Television
Listening to news broadcasts, entertainment, advertisements and education	➢ Radio

ASSESSMENT

1. List 5 uses of energy

ANSWER

(i) Producing light for seeing in the dark (ii) Cooking food and boiling water (iii) Keeping food and drinks fresh and cool respectively (iv) Keeping the room cool

(v) Boiling water

JSS 1

BASIC SCIENCE

THIRD TERM

TABLE OF CONTENT

Week 1

Topic: Human Reproduction (I)

Contents:

- Menstruation
- Menstrual Hygiene
- Ovulation
- Fertilization

WHAT IS MENSTRUATION?

Menstruation is the monthly flow of blood from the womb, through the vagina in every woman of childbearing age. This period is called Menstrual Period. It takes place after about every 25-30 days. The number of days before the next period is called 'Menstrual Cycle'. The menstrual period is different from one person to another.

I. MENSTRUAL HYGIENE

As the body sends out blood, it also sends out body odour. It should be noted that during the menstrual period, there is a high risk of infection.

II. MENSTRUAL HYGIENE PRACTICES

The following are the hygiene practices to follow during menstruation:

Use very good and absorbent sanitary pads

Take frequent baths (at least twice a day)

Sanitary pad should be changed to prevent odor.

Some powder may be sprinkled on the inside of each thigh to reduce the chances of the place becoming sore

Always wash your hands after each change of pad

The soiled pad should be wrapped in paper or nylon before disposing in the waste bin

OVULATION

Ovulation is the release of egg from the ovaries. In humans, this event occurs when the

follicles rupture and release the secondary oocyte ovarian cells. After ovulation, during the luteal phase, the egg will be available to be fertilized by sperm. Ovulation is the name of the process that happens usually once in every menstrual cycle when hormone changes trigger an ovary to release an egg. You can only become pregnant if a sperm fertilises an egg. Ovulation usually happens 12 to 16 days before your next period starts.

Approximately every month an egg will mature within one of your ovaries. As it reaches maturity, the egg is released by the ovary where it enters the fallopian tube to make its way towards waiting for sperm and the uterus.

The lining of the uterus has thickened to prepare for the fertilized egg. If no conception occurs, the uterine lining, as well as blood, will be shed. The shedding of an unfertilized egg and the uterine wall is the time of menstruation.

SIGNS OF OVULATION

Mucus – As you near ovulation, your body produces more estrogen, causing cervical mucus to become stretchy and clear, like egg white, which helps sperm swim to the egg that's released during ovulation

Breast soreness or tenderness

Light spotting or discharge – Brown discharge or spotting during ovulation is normal if not that common. This ovulation symptom can occur when the follicle that surrounds and protects the developing oocyte, or egg, matures, grows and then ruptures, resulting in a small amount of bleeding. As blood gets older, it turns brown, which is why the vaginal discharge may range from red to dark brown.

Higher Sex drive

Changes in Cervix – During ovulation, your cervix may become higher, softer and more open.

FERTILIZATION AND CONCEPTION

Fertilization Definition – Fertilization is the union of a egg (ovum) and sperm, usually occurring in the ampulla of the fallopian tube. The result of this union is the production of a zygote cell, or fertilized egg, initiating prenatal development. Conception occurs when the sperm penetrates the waiting Ovum (Egg).

Ovulation

Each month inside your ovaries, a group of eggs starts to grow in small, fluid-filled sacs called follicles. Eventually, one of the eggs erupts from the follicle (ovulation). It usually happens about 2 weeks before your next period.

Hormones Rise

After the egg leaves the follicle, the follicle develops into something called the corpus luteum. The corpus luteum releases a hormone that helps thicken the lining of your uterus, getting it ready for the egg.

The Egg Travels to the Fallopian Tube

After the egg is released, it moves into the fallopian tube. It stays there for about 24 hours, waiting for a single sperm to fertilize it. All this happens, on average, about 2 weeks after your last period.

If the Egg Isn't Fertilized

If no sperm is around to fertilize the egg, it moves through the uterus and disintegrates. Your hormone levels go back to normal. Your body sheds the thick lining of the uterus, and your period starts.

Fertilization

If one sperm does make its way into the fallopian tube and burrows into the egg, it fertilizes the egg. The egg changes so that no other sperm can get in.

The fertilized egg stays in the fallopian tube for about 3 to 4 days. But within 24 hours of being fertilized, it starts dividing fast into many cells. It keeps dividing as it moves slowly through the fallopian tube to the uterus. Its next job is to attach to the lining of uterus. This is called implantation.

Questions

1. ____ is the monthly flow of blood from the womb, through the vagina in every woman of childbearing age.
2. ____ is the union of a egg (ovum) and sperm, usually occurring in the ampulla of the fallopian tube.
3. ____ is the name of the process that happens usually once in every menstrual cycle when hormone changes trigger an ovary to release an egg
4. Menstruation takes place every _____ days
5. To ensure good menstrual hygiene, ____ is commonly used during menstruation

Answers

1. Menstruation
2. Fertilization
3. Ovulation
4. 25 to 30
5. Sanitary pad

Week 2

Topic: Human Reproduction (II)

Contents:

- Symptoms of Pregnancy
- Growth of the foetus

A. WHAT IS PREGNANCY?

Pregnancy is the result of the fertilization of the female ovum or egg by the male cell or sperm. Pregnancy is also the period from conception to birth. After the egg is fertilized bya sperm and then implanted in the lining of the uterus, it develops into the placenta and embryo, and later into a foetus. Pregnancy usually lasts 40 weeks, beginning from the first day of the woman's last menstrual period, and is divided into three trimesters, each lasting three months. Pregnancy is that state or condition when a female carries a foetus in her womb for about nine months.

A foetus is an unborn baby. The male sex cell is called Sperm. The female sex cell is called Ovum or Egg. It is produced in the ovary. The process of producing an ovum by the ovary is called Ovulation. If there is a sexual relationship or intercourse between a man and woman at the period the ovum is produced, the sperm will fertilize the ovum, this will result in pregnancy. If there is no sexual relationship during this period, the released ovum will die off in a day or two, then menstruation occurs.

SIGNS OF PREGNANCY

- Menstruation stops
- Breasts become fuller and tender. Nipple become dark
- Nausea and vomiting may occur, especially in the morning (morning sickness)
- There may be frequent urination
- The abdomen enlarges from about 3 months
- As the pregnancy advances, the mother may feel the baby's movement.

B. STAGES OF PREGNANCY DEVELOPMENT

Pregnancy goes through three stages. Each stage takes 3 months. These stages are referred to as Trimesters.

- First Trimester: This is the first three months of pregnancy. This is a very delicate period because if anything happens to the foetus at this stage, it can lead to abortion or miscarriage. The placenta forms to provide the foetus through the umbilical cord.
- Second Trimester: This is the pregnancy period between 3 and 6 months. This stage is more stable than the first trimester.
- Third Trimester: This is the pregnancy period from 6 to 9 months. It requires adequate nourishment for growth. At the end of this trimester, the mother enters into labor and the child is born.

C. CARING FOR A PREGNANT WOMAN

In the caring for a pregnant woman, the following aspects must be considered.

- Nutrition during pregnancy
- Hygiene
- Posture
- Exercise
- Special dresses

Assessment

One of the following is not a sign of pregnancy

a. Menstruation stops

b. Breasts become fuller and tender.

c. Nausea and vomiting may occur

d. Inability to urinate

…….. is the result of the fertilization of the female ovum or egg by the male cell or sperm.

……. is an unborn baby

The stages of pregnancy are referred to as ……..

a. semester

b. trimester

c. sessions

d. none of the above

Each stage of pregnancy lasts for …….

a. 2 months

b. 3 months

c. 4 months

d. 1 month

Answers

1. D
2. Pregnancy
3. Foetus
4. B
5. B

Week 3

Topic: Forces

Introduction

In everyday language, force suggests the use of compulsion or strength. If your parents forced you to wash your school dress after school on a Wednesday.. it means that they compelled you to do it.

Concept of Force

A force is a thing that,

1. changes the shape of a body

2. makes a body at rest move

3. changes the speed of a moving body

4. causes a moving body to change direction

5. causes a moving body to stop

Altogether , force is defined as that which changes the shape, speed or direction of a moving body.

Types of Forces

1. Contact force
2. Magnetic force
3. Electrical force
4. Gravitational force
5. Frictional force
6. Forces occur in Pairs

A British scientist, Sir Isaac Newton stated three laws of motion. The first of these is that to every action, there is an equal and opposite reaction. Three simple illustrations will be given:

When you push down on a spring mattress, you apply force. The spring mattress reduces in size. As soon as you let go the force you apply, the spring mattress bounces back to its normal size. This is because as you apply force to push the mattress down, the mattress is pushing back at you.

When you pull a rubber band to stretch it, the rubber band is pushing back at you. As soon as you leave the rubber band, it contracts to its normal state.

A canoe paddler dips the paddle into the water and moves the paddle backways. As this is done, the water pushes the canoe forward with an equal and opposite force.

Contact Force

A contact force is a force applied directly to an object. It may involve pushing or pulling. Other examples of the use of contact force are

1. Stretching the sling of a catapult
2. Twisting (wringing) a washed cloth to remove water from it
3. Squeezing a ball of clay and moulding it into shape
4. Bending an iron rod

Magnetic Force

Two ends of a bar magnet attract each other, while two ends repel each other. Like poles repel each other while unlike poles attract each other. Also, a magnet can attract iron fillings when it comes in contact with it. This shows that magnetic force acts over an area around the magnet. For this reason, a magnetic force is called a Field Force which acts over an area or force field.

Magnetism is a Non- contact force, magnetism is invisible to the human eye and it can be made with useful tools and machines. In the 1700s scientists discovered that magnetism has similar features as electricity. Magnetism is not attracted to silver, gold, platinum and aluminium.

Gravity

Gravity is another non-contact force. Gravity is the force that pulls you down and allows you to stay on earth instead of floating off. Gravity means what comes up must come down. Gravity is keeping us in orbit, because the suns gravitational pull keeps our planet in orbit. The moon is affected by the suns gravity and the earths' gravity. The moons gravity is the reason why our tides go up and down. Weight effects gravity for example if you drop an acorn it will fall slower than a piano because the piano is heavier than the acorn. Sir Isaac

newton was the person that discovered gravity but he didn't know how to explain it. Then Albert Einstein came along and explained how gravity works.

Frictional Force

Friction is another contact force. It can be helpful and it allows you to let you walk without sliding. The heavier an object is the more friction it has. Friction can be destructive for example if you rub out the mistakes you made, the rubber become smaller and smaller. There are 4 types of friction sliding friction, static friction, rolling friction and fluid friction. Sliding friction is produced when the bumps on the surface stick together, sliding friction can also slow down objects. Sliding friction occurs when two objects slide past each other.

Advantages of Friction

1. Friction makes movement possible. If friction is totally absent, we will slip, as is sometimes the case on a polished floor.
2. We can not fix nail in the wood or wall if there is no friction. It is friction which holds the nail.
3. A horse can not pull a cart unless friction furnishes him a secure Foothold.
4. It becomes possible to transfer one form of energy to another.
5. Objects can be piled up without slipping.
6. Brakes of vehicles work due to friction.

Disadvantages of Friction

1. Friction creates more work for moving machines which therefore consumes more fuel on rough than on smooth surfaces
2. Friction increases wear and tear
3. Friction makes us spend money on Lubrication
4. It always resists the motion, so extra energy is required to overcome it.
5. It decreases the life expectancy of moving parts of vehicles.

Methods of increasing friction:

In many cases, friction is very useful. So, enough friction is required and hence become necessary to increase the friction. Some of the common methods of increasing friction are:

1. Spreading sand in slippery roads.
2. Making rough shoe soles.
3. Making surface of footpath rough.
4. Fitting spikes in sport shoes.

Methods of reducing friction:

In many cases, friction is very harmful. So, friction needs to be reduced. Some og the ways of reducing frictions are:

1. Polishing or smoothing the surfaces.
2. By the use of lubricants which increases the smoothness of the surface.
3. Giving streamlines shape to submarines, jets etc
4. By using ball bearing in wheels.

Questions

Which of the following statement is false?

a. A force changes the shape of a body

b. A force changes the speed of a body

c. Forces do not occur in pairs

d. Forces may be balanced and unbalanced

Which of the following is NOT a type of force?

a. Magnetic

b. Electrical

c. Contact

d. Reversible

When a canoe-man paddles backwards in the water , the canoe moves forward. This shows that

a. forces occur in pairs

b. contact force is acting

c. a force is involved

d. there is friction between the boat and the water

____ increases wear and tear of surfaces

One of the following is a contact force

a. Frictional force

b. Gravitational force

c. Magnetic force

d. none of the above

Answers

1. C
2. D
3. A
4. Friction
5. A

Week 4

Topic: Gravitational Field

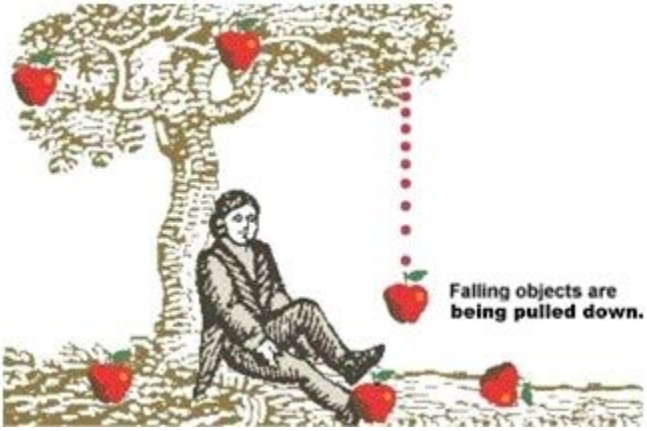
Introduction

Gravitational

This is a force with which the earth attracts objects towards its centre. If you throw a coin up, what do you expect? You will notice that the coin will go up and at a certain point stop before beginning to come down. Is there anything pulling the coin down? Yes, although you may not see anything pulling it. The force due to gravity, is pulling the coin to the centre of the earth.

Assuming you are holding a mass of 20g in your hand. Climb a tree or a high object. Release the mass, what do you notice? You will notice that the weight did not go horizontally but vertically.

There is a force acting on that mass downwards. That is to say there is a force attracting the mass to the centre of the earth. If two objects of the same density are released from a height at the same time, do you think they will fall at the same time? What happens if they have different densities like a coin and a feather? Two objects of the same density will fall at the same time while two objects of varying densities like a coin and a feather will not fall at the same time. The coin will fall faster than the feather. This is so because of air resistance on the feather. If air is removed and we now have a vacuum, the two objects of varying densities will fall at the same time.



Calculation of Gravitational Force

Imagine an object of mass M kilogrammes raised from the ground level to a height h metres above the ground

The force of gravity on the mass = mg

Where g is the acceleration due to gravity in metres per second squared (ms-2)

The workdone against gravity in raising the mass is

= Force x distance moved

= mg x h

= mgh

If M is in kilogrammes, g in ms-2 and h in metres

Then force = mg in Newtons

Workdone = mgh in joules

Example 1:

Calculate the gravitational force on a mass of kilogrammes if the acceleration due to free fall under gravity is 10 ms-2.

Solution:

Force on mass = mg = (2 x 10) N

= 20N

Example 2:

Find the workdone on a mass of 2kg if it is raised up to a height of 10m.

Solution:

Mass lifted = 2kg

Acceleration due to gravity = 10 ms-2

Height raised = 10m

Workdone = mgh

2 x 10 x 10

200 J

Therefore, work done on mass is 200 Joules

Assessment

Calculate the work done if a body of mass 5kg is lifted over a height of 25m. Take g = 10ms-2

Calculate the gravitational force on a mass of kilograms if the acceleration due to free fall under gravity is 10 ms-2.

Week 5

Topic: Space Travel

Introduction

The age we live in is sometimes called the Space Age. It is in this age that the longing of man to reach out beyond the earth changed from wishing to reality.

The Universe

The Universe is a very expansive space which includes all the stars and our solar system. Our solar system consists of the sun and nine planets which inclue Mercury, Venus, Earth, Mars, Jupiter, saturn, Uranus, Neptune and Pluto and their moons. The light, which reaches the earth comes from the sun and the stars. The stars are themselves suns with their own solar systems. Light travels at a very high speed. The sky on a bright night seems to be filled with stars. though each of the stars when observed appears very small, the stars are far bigger than the earth on which we live. Some of the larger stars have been estimated to be many million times the size of the earth. The stars are not scattered regularly in space. They occur in clusters known as galaxies or nebulas. Each galaxy may contain as many as 100 million stars. Can you imagine how many stars there are in the universe and how large the universe is? The distance between the various stars and their solar systems is so large that the universe could best be described as approximately infinite. Of the nine Planets, Mercury is the smallest and closest to the sun. The distance between Mercury and the Sun is 57,900,000km.

Space

The space outside the sun, stars and planets is also called Outer Space. The light from the stars travels at a speed of 299,400km per second. The ray of light from the sun takes about eight minutes to reach the earth. The earth with a diameter of 12,700km is about 149million km from the sun. Light from the moon takes only one second to reach us n earth. The sun and all the other planets with their moons remain suspended in space with each keeping to its position because of the mutual attraction that exists among them.

Characteristics of Outer Space.

1. Light from the sun passes through the outer space
2. There is no gravity i outer space
3. The outer space is empty or void
4. Sound does not pass through outer space and therefore the outer space is

always quiet.

5. Outer space is very large and beyond our imagination.

Purpose of Space Travel

Space travel simply means going to the moon or planets or orbiting the earth in a special craft called spaceship, Space travel dates back to October 4 1957, when the USSR succesfully launched the first artificial satellite. This was followed by series of unmanned spacecraft that sent coded information by radio and television pictures of the surface features of other planets in space back to the earth. In April 1961, the USSR successfully place the first man Yuri Gagarin in orbit round the earth. Since then, there have been many manned flights in outer space.

Problems of Space Travel

The force of Gravity – This is the pull or attraction between the earth itself and objects on or near it. The force of gravity makes it difficult for any spacecraft to escape the earth's surface easily. It has to be at a very high speed before the spacecraft can be allowed to leave the earth's surface. The speed that allos a spacecraft to leave the earth's surface is known as escape velocity. Objects such as rockets require escape velocity to escape from the attraction of the earthnor force of gravity. When a rocket is fired, it overcomes the earth's gravitational field before it escapes into space.

Basic needs of life – The basics needs of life such as water, oxygen and food must be made available in the spaceship to last for the period of the trip in space.

Loss of Weight – The force of gravity is not felt in space, therefore for astronauts or human beings who go into space, it is difficult for them to stand or walk as they do on earth. The require special equipment and training to adjust to the conditions of weightlessness in space.

High Speed – Astronauts have to be trained in order to adapt to the high speed of space travel so that they can think and work normally while traveling in space.

Complicated Calculation – There are a lot of calculations involved before a spaceship or spacecraft can be launched correctly at an angle, sped and time in order to arrive at its destination. This is because the earth, the moon and all planets are always in rapid motion. It will therefore be difficult for any of the moving bodies to have a precise position.

Dangers of Space Travel

Space travel can be risky. If anything goes wrong, one or more lives will be lost. This loss of life can be caused by the following problems.

1. Explosion of rockets at the launch pad

2. Explosion of rockets in flight
3. Wrong calculation of angle, speed and time of launching
4. Inability of the rocket to reach escape velocity
5. Failure of some necessary equipment in the spaceship to function well.

Benefits of Space travel

1. The main advantage of space travel is the collection of scientific information about the earth and other planets. Other benefits include the production of special
2. Computers
3. Photographic equipment suc as x-ray and gamma -ray machines
4. Telecommunication equipment
5. Remote sensing equipment to guide aircraft or spacecrafts
6. Rocket or aircraft fuels.

Questions

The space outside the sun, stars and planets is also called ___

a. space age

b. outer space

c. inner space

d. galaxy

Which of the following is not a problem of space travel?

a. The force of gravity

b. Basic needs of life

c. Loss of weight

d. Low speed

Which of the following can not be carried in a space craft

a. oxygen

b. materials for keeping warm

c. force of gravity

d. water

Which of the following is present in outer space

a. Air

b. Light

c. Force of Gravity

d. Life

Answers

1. B
2. D
3. C
4. D

Week 6

Topic: Gravitation and Weightlessness

Introduction

Gravitation is a science concept that lead had been known and understood from Newton's time. It was he who propounded the laws of universal gravitation from mathematical theory. Since that time, the theory has been used by other scientists in computing various constants and quantities that relate to objects on earth and in space. Gravitational pull is a force of attraction which everbody exerts on every otherbody. The earth has a large gravitational pull on objects because of its large size.

Meaning of Gravitation

There is a force which pulls things thrown upward towards the earth. This force is called gravitation.

The scientist discovered the existence of this force was Isaac Newton. He said that the force of gravity or gravitational force exists between all bodies. Thus, any two masses which are separated by a distance have a force of attraction called gravitation existing between them. Gravitational force is that force which pulls us towards the earth. It is this force that gives all objects their weight. The weight of an object is the force with which the earth pulls the object.

Weightlessness

When an object moves round a circle at high speed, a force called centripetal force acts on it. This force is one that makes a body moving with constant speed to remain in its circular motion. It is always directed towards the centre of the circle.

The total gravitational force on a body is composed of two forces for an object moving in a circle. The first component is its weight, while the other is the centripetal force. If the speed is very high, the centripetal force may be nearly equal to the weight. When this happens, the moving body experiences weightlessness.

Weightlessness is a condition that occurs in objects in fast circular motion when the centripetal force is equal to the weight of the object. In this condition, the two forces are equal and opposite.

Effects of Gravitation on Objects

1. Gravity causes objects to move e.g. a falling fruit from the top of a tree
2. Gravity provides an objects revolving in a circular motion with centripetal force especially large objects in space such as the moon
3. Balance of planets in our solar system – The sun and all the planets in our solar system exercise gravitational pull on one another and mutually balance one another in space.
4. Work is done every time we lift an object from the earth. Lifting an object involves opposing gravitational pull.

Questions

Gravitational force is a force of

a. separation

b. friction

c. repulsion

d. attraction

The earth has a large gravitational pull on objects because the earth

a. has plants and animals

b. is a planet

c. is large in size

d. revolves

_____is the force which pulls things thrown upward towards the earth

a. size

b. Frictional

c. Gravitational

d. Relational

When a metal ball of 20kg and a wooden ball of 10kg are dropped from the same height,

a. the metal ball will reach the ground before the wooden ball

b. both balls will reach the ground at the same time

c. the wooden ball will fall faster than the metal ball

d. the metal ball will fall sideways

Answers

1. D
2. C
3. C
4. B

Week 7 & 8

Topic: Earth in Space

Introduction

The interest of man in space has existed from ancient times when man employed the naked eyes to study and speculate on the moon, the stars, the sun, and other things which were imagined to be there in space. As time went by, man began to carry out more systematic studies of space. By the second century AD, a Greek mathematician called Ptolemy proposed that the earth moved in space. By the 16th century AD, some other scientists such as Tycho Brahe and Kepler had deducted the relationships between the motion of the earth round the sun and the motion of the moon round the earth. In the year 1686, Isaac Newton deduced and published the laws of mechanics. These included those governing the circular motion of the earth round the sun.

Tycho Brahe was one of those scientists who made very powerful telescopes for studying the details of very for objects such as those in space like the moon. The use of such powerful telescopes revealed that many more planets than just the earth existed. It also revealed that there were other smaller bodies which moved round some of the planets. These smaller bodies were then called moons.

Since scientists found that there were many planets which moved round the sun, man has been curious to find out whether:

There was life on the moon and other planets

Man could leave the earth and go to settle on any of the planets or the moon

By the end of World War II in 1945, powerful nations such as Russia (then USSR) and the United States of America began to think of establishing space stations on the moon. There were doubts however whether it was possible to establish such space stations. This was the origin of space exploration.

The Solar System

The solar system consists mainly of the sun and nine planets which move around it, with the sun at the centre. The planets are massive objects in the solar system and they are kept in their track around the sun as a result of a force of attraction from the sun. The distance of these planets to the sun determines how long it takes for the planets to complete one revolution round the sun. The time it takes for the planets to complete one revolution round the sun is known as the planet's year. For earth, the planet year is 365 days or 3.2 x 107 seconds.

Apart from the planets, there are also several moons. A moon is a satellite of a planet. For example, the earth has only one moon which moves round it; mars has two moons; Jupiter has twelve moons; Saturn has nine and Uranus four.

What is Space?

Space refers to the region of our environment outside the earth's crust. There are three important regions outside the earth's surface. These are the troposphere, the stratosphere and ionosphere.

The troposphere starts from the surface of the earth and extends to a height of about 16,000 metres. Most of the air and water vapour in our environment are found in this region. As one goes up in the troposphere, the temperature falls and it therefore falls and it therefore becomes cooler. The stratosphere is the region directly above the troposphere. The region contains very little air. The temperature of the stratosphere does not fall as one goes up in this region.

The ionosphere is the upper part of the atmosphere. It contains mainly charged particles. The ionosphere is very useful to man because it enables the reflection and transmission of radio waves and signals round the world. You listened to radio programmes from other parts of the world, for example, Voice of America and BBC. You can now know how these radio broadcasts reach you in Nigeria.

The Earth

The eart is a natural body which revolves in space around the sun. It is one of the nine planets called the inner planets because it is comparatively near the sun. The shape of the earth is best described as spheroid such that starting from any point on its surface and travelling in a straight line, one will eventually come back to the starting point. This means that the diameter along the equator is not exactly equal to the diameter along the north and south poles. However, if we assume the earth to be a perfect sphere, the average radius will be 6400 Kilometres. The earth consists of a solid part called the lithosphere, the waters covering 75% of the earth's surface is known as hydrosphere and the gaseous envelope surrounds the other two parts is called atmosphere.

Formation of Volcanoes

The centre of the earth is hot molten mass that is under very high pressure. When a crack occurs in the hard covering of the earth, the pressure on the molten interior pushes out some of the sludge to the surface. The phenomenon is what is called Volcano eruption.

Rotation of the Earth

The earth moves (rotates) round the sun. In doing this, it traces out a path on its journey round the sun. The path is called the earth's orbit. The earth also rotates round its North-South axis once in twenty-four hours. The journey round the sun is called the planet's year.

So one year on the earth is 365 days. The earth has two types of movement; circling round and round its axis and revolving round the sun.

The Moon

The moon is the nearest heavenly body to the earth. The radius of the moon's orbit round the earth is about 384,000 km. While the diameter of the earth is 12,800 km, the diameter of the moon is 3, 200 km. The moon is much smaller than the earth and is also far away from it. The earth has a much greater mass than the moon and therefore has a controlling influence on the motion of the moon.

Phases of the Moon

Phases of the moon refer to the bright surface of the moon which is visible from earth at night. The good way to understand the phases of the moon is to examine an earth-moon-sun diagram:

It's probably easiest to understand the moon cycle in this order: new moon and full moon, first quarter and third quarter, and the phases in between.

As shown in the above diagram, the new moon occurs when the moon is positioned between the earth and sun. The three objects are in approximate alignment. The entire illuminated portion of the moon is on the back side of the moon, the half that we cannot see.

At a full moon, the earth, moon, and sun are in approximate alignment, just as the new moon, but the moon is on the opposite side of the earth, so the entire sunlit part of the moon is facing us. The shadowed portion is entirely hidden from view.

The first quarter and third quarter moons (both often called a "half moon"), happen when the moon is at a 90 degree angle with respect to the earth and sun. So we are seeing exactly half of the moon illuminated and half in shadow.

Once you understand those four key moon phases, the phases between should be fairly easy to visualize, as the illuminated portion gradually transitions between them.

An easy way to remember and understand those "between" lunar phase names is by breaking out and defining 4 words: crescent, gibbous, waxing, and waning. The word crescent refers to the phases where the moon is less than half illuminated. The word gibbous refers to phases where the moon is more than half illuminated. Waxing essentially means "growing" or expanding in illumination, and waning means "shrinking" or decreasing in illumination.

Thus you can simply combine the two words to create the phase name, as follows:

After the new moon, the sunlit portion is increasing, but less than half, so it is waxing crescent. After the first quarter, the sunlit portion is still increasing, but now it is more than half, so it is waxing gibbous. After the full moon (maximum illumination), the light continually decreases. So the waning gibbous phase occurs next. Following the third quarter is the

waning crescent, which wanes until the light is completely gone — a new moon.

Climate and Seasons

Weather changes in cycles. Cycles of weather changes are called seasons.Weather forecasters tell us what the weather will be like. They find out from meteorologists. Meteorologists are scientists who study weather. There are four seasons: winter, spring, summer and autumn. Some seasons are hot. Some seasons are cold. Some seasons are wet. Some seasons are dry. Winter is the cold season. Summer is the hot season, These seasons are often dry. Spring is the season between winter and summer. The air begins to warm in the spring. Autumn, or fall, is the season between summer and winter. The air begins to cool in the fall. Spring and fall are often wet.

Cycles of weather changes differ from place to place. The long-term pattern of weather in any part of the world is called climate. There are three major climate zones: tropical, temperate, and polar. Climate zones differ in temperature and precipitation. Tropical climates are usually warm and wet most of the year. Much of Central and South America are in the tropical climate zone. Temperate climates cycle through all four seasons—winter, spring, summer, and autumn. Much of the United States is in a temperate climate zone. Polar climates are usually cold and dry most of the year. Antarctica is in a polar climate zone.

Shadows and Eclipses

Light produces shadows when solid objects obstruct its passage a shadow is a shade and a shade is obtained when an object blocks the path of light rays. The sun is the object which supplies the earth and moon with daylight. The sun moves round the sun, while the moon moves round the earth. Sometimes, the moon gets in between the sun and the earth.

An eclipse of the Sun (or solar eclipse) can only occur at New Moon when the Moon passes between Earth and Sun. If the Moon's shadow happens to fall upon Earth's surface at that time, we see some portion of the Sun's disk covered or 'eclipsed' by the Moon. Since New Moon occurs every 29 1/2 days, you might think that we should have a solar eclipse about once a month. Unfortunately, this doesn't happen because the Moon's orbit around Earth is tilted 5 degrees to Earth's orbit around the Sun. As a result, the Moon's shadow usually misses Earth as it passes above or below our planet at New Moon. At least twice a year, the geometry lines up just right so that some part of the Moon's shadow falls on Earth's surface and an eclipse of the Sun is seen from that region.

The Moon's shadow actually has two parts:

Penumbra

- The Moon's faint outer shadow.
- Partial solar eclipses are visible from within the penumbral shadow.

Umbra

- The Moon's dark inner shadow.
- Total solar eclipses are visible from within the umbral shadow.

When the Moon's penumbral shadow strikes Earth, we see a partial eclipse of the Sun from that region. Partial eclipses are dangerous to look at because the un-eclipsed part of the Sun is still very bright. You must use special filters or a home-made pinhole projector to safely watch a partial eclipse of the Sun

An eclipse of the moon occurs when the earth moves into the space between the moon and the sun. The earth the blocks the moon from direct sunlight. The moon then will be in the region of the earth's shadow.

What is a Star?

A star is a ball of gas held together by its own gravity. The force of gravity tries to force the star to collapse but this force is countered by the pressure of the hot gas inside the star or by the radiation from within the star. This is called hydrostatic support. Stars are very far away from the earth. That is why they appear as tiny points of light.

How a Star is Formed

A star is formed when great clouds called nebulae collapse because of gravitation. If these clouds are large enough, the temperature and pressure in them starts off a type of nuclear reaction called thermonuclear reaction. In this type of reaction, hydrogen inside the cloud will be changed to helium. The reaction, which takes place in chains, produces a high amount of heat energy. This is the origin of the light of the stars. The very bright stars are called active stars. Some stars have ceased to be active and are not as bright as active stars, because their centres are no longer undergoing nuclear transformations. When the hydrostatic support inside a star can no longer balance the gravitational force, such star disintegrates, producing meteorites.

The study of stars dates back to ancient times or the study of star in groups is usually referred to as constellation.

Four major groups of stars can be seen at various periods of the year in our part of Africa. These are:

Orion: This is a group of about nine stars that almost form a rectangle. Orion may be visible from the months of December, through January to April.

Plough: This is a group of seven bright stars. They may be seen from early evening between the months of April and July.

Scorpius: This is another group of stars seen in groups of two. One with three star each and the other with one other star that is farther away from the others. These stars may be seen between June and October.

Pegasus: This is another group of seven stars, five of which are prominent with the remaining two not being outstanding. Pegasus may be seen between September and December.

It is important to note that the sun is also a star. The energy and heat from the sun is similar to the ones that give the other stars their light at night.

Questions

The earth is a ____

a. planet

b. rotates on its axis

c. revolves round the sun

d. all of the above

Which of the following statements is false?

a. The sun produces light

b. The moon gives out light at night

c. The sun is a star

d. The earth produces its own light by day

The solid layer of the earth is called

a. lithosphere

b. atmosphere

c. hydrosphere

d. biosphere

A ____ is a ball of gas held together by its own gravity

a. moon

b. sun

c. star

d. earth

____ refers to the region of our environment outside the earth's crust.

Answers

1. D
2. D
3. A
4. C
5. Space

Week 9

Topic: Satellite

Meaning of Satellite

A satellite is an object that revolves round another object (which is known as its primary). Satellites can be man-made or may be naturally occurring such as moons, comets, asteroids, planets, stars and even galaxies.

An orbit is the path that an object makes around another object while under the influence of a source of centripetal force, such as gravity.

Orbits were first analyzed mathematically by Johannes Kepler who formulated his results in his three laws of planetary motion. Isaac Newton demonstrated that Kepler's laws were derivable from his theory of gravitation and that, in general, the orbits of bodies responding to the force of gravity were conic sections.

Newton showed that a pair of bodies follows orbits of dimensions that are in inverse proportion to their masses about their common centre of mass. Where one body is much more massive than the other, it is a convenient approximation to take the centre of the mass as coinciding with the centre of the more massive body.

Nigeria SAT 1

Nigeria SAT 1 means the first Nigerian satellite sent into orbit. It was launched on 27th September 2003, abroad a Russian rocket. The satellite is to monitor water resources, soil erosion, deforestation and disasters. It will also used to survey oil pipelines, and prevent oil theft and smuggling activities. In specific terms, the satellite is expected to boost expansions in communication, agriculture, security surveillance and government is expected to earn 200 million US Dollar annually from subscriber Africa nations.

Nigeria SAT 1 can image scenes as large as 640 x 560 km, providing unparalleled wide-area, medium-resolution data. The data will be used within Nigeria to monitor pollution, land use and other medium-scale phenomena. Besides, satellites are now regarded as the workhorses of communication, weather forecasting, intelligence gathering, population survey and a host of other services that have become vital aspects of human development.

Uses of Satellite

Satellite serve the following purposes:

1. To give advance warnings of natural disasters like floods, earthquakes, volcanic eruptions and storms
2. To warn against or manage occurrence of man-made disasters like oil pollution, desertification, erosion, forest fire and deforestation
3. In agriculture, for mapping, land use, planning, management of sustainable grazing, forest logging, planning afforestation programmes, crop inventory and yield forecast
4. Water resources development and management, including assessment of the quantity and quality of surface and underground water, rainfall prediction, as well as integrated water resources management on drought and other disaster forecast
5. Solid mineral exploration and exploitation, including general geological mapping and map update or revision, as well as differentiating host mineral areas in oil, gas and sold mineral exploration
6. For monitoring the Ecosystem. Evaluation and monitoring of vegetation and land use as well as the aquatic system
7. Local and regional planning for tourism and its potentials
8. Demographic uses such as mapping and planning of population surveys, census enumeration areas, as well as mapping, planning and monitoring of rural and urban growth.
9. Mapping of state and international boundaries, planning and mapping of terrain for defence and security purposes, as well as identification of international criminals
10. In public health delivery to establish the relationship between malaria vectors and the environment that breeds malaria, while its remote sensing technology can be used to give early warning signals on future outbreaks of meningitis
11. To provide the technology needed to bring education to all parts of the country via distant learning
12. It is used as communication satellites which are artificial satellites stationed in space for the purposes of telecommunications
13. Navigation satellites are satellites which use radio time signals transmitted to enable mobile receivers on the ground to determine their exact location. The relatively clear line of sight between the satellites and receivers on the ground, combined with ever-improving electronics, allow satellite navigation systems to measure locations to accuracies on the order of a few metres in real time. The

exact location can be found by the use of geographical information system (GIS).

Assessment

Mention 4 uses of satellites

Week 10

Topic: Consequences of Teenage Pregnancy

Introduction

Teenage pregnancy is pregnancy that happen in human females under the age of 20 at the time that the pregnancy ends. A pregnancy can take place in a pubertal female before marriage, which signals the possibility of fertility, but usually occurs after marriage.

Teenage pregnancy is defined as pregnancy that occurs in women below the age of 20. It is common that at this age, the girl has not completed her education and is completely dependent upon her parents thus unable to provide for the unborn child.

Teenage Pregnancy Risks

Infants born to teenage mothers are at increased risk for a number of health risks. These risks include the following:

Teenage mothers are less likely to gain adequate weight during their pregnancy, leading to low birthweight. Low birthweight is associated with several infant and childhood disorders and a higher rate of infant mortality. Low birthweight babies are more likely to have organs that are not fully developed, which can result in complications, such as bleeding in the brain, respiratory distress syndrome, and intestinal problems.

Teenage mothers have a higher rate of poor eating habits than older women and are less likely to take recommended daily prenatal multivitamins to maintain adequate nutrition during pregnancy. Teens also are more likely to smoke cigarettes, drink alcohol, or take drugs during pregnancy, which can cause health problems for the baby.

Teenage mothers receive regular prenatal care less often than older women. Prenatal care is essential for monitoring the growth of the fetus and the health of the mother.

Consequences of Teenage Pregnancy

The children are:

1. Less likely to receive timely and consistent prenatal care.
2. More likely to be born prematurely, to have low birth weight and more serious medical and developmental problems.
3. More likely to live in poverty.
4. More likely to have lower academic performance, worse behavioural outcomes

and become school dropouts.

5. More likely to require government assistance and taxpayer-funded programs.
6. More likely to be victims of abuse.
7. More likely to be committed to a juvenile detention facility or prison.
8. More likely to continue the cycle of teen pregnancy by engaging in sex at an earlier age.

The mothers are:

1. More likely to have pregnancy or delivery complications.
2. Less likely to get a high school diploma.
3. Less likely to get a college degree.
4. More likely to live in poverty.
5. Less likely to be in a stable marriage or relationship.
6. More likely to get government help such as welfare, housing assistance and food stamps.
7. Prevention of Teenage Pregnancy

Teen Pregnancy can be reduced through:

1. Individual ability to refuse sex (total abstinence)
2. Limit number of partners.
3. Communication with parents or other adults about sex, condoms, and contraception.
4. Avoidance of places and situations that might lead to sex
5. promoting access to accurate information on sexual and reproductive health
6. Delay Sex
7. Use Contraception: If you do choose to have sex, you need to make sure that you use protection correctly every single time you have sex.

Note: Not having sex at all is the only 100% effective method of preventing pregnancy and STIs.

Medical Care and Support for Pregnant Teenagers

Emotional support: A trusted adult can offer a crucial source of emotional support for a pregnant teen. Support from a professional counselor helps teens who experience severe emotional or mental difficulties in dealing with the pregnancy

Financial support: Teens often lack the financial means to cover prenatal care costs and to support the baby after she is born.

Medical support: Prenatal care is essential to a healthy pregnancy, but many pregnant teens don't have access to medical care.

Parenting skill support: Most teens, even those who choose to keep the baby, lack necessary parenting skills. Prenatal and parenting classes prepare a pregnant teen for some of the situations they will encounter, including what to expect during the labor and delivery.

Decision support: A pregnant teen faces the decision of whether or not to keep her baby. Support in that decision helps the teen make a decision she can live with and and helps her deal with the consequences of that decision.

Assessment

1. Mention 3 ways of preventing teenage pregnancy
2. List 4 consequences of teenage pregnancy
3. …… pregnancy is defined as pregnancy that occurs in women below the age of 20