

J.S.S TWO THIRD TERM SCHEME OF WORK FOR BASIC SCIENCE

WEEK 1: Thermal energy {1}.

WEEK 2: Thermal energy {2}.

WEEK 3: Reproductive health

WEEK 4: Abstinence

WEEK 5: Chemicals

WEEK 6: Chemicals {safety measures}

WEEK 7&8: Drug abuse

WEEK 9: Crude oil and petrochemicals {1}

WEEK 10: Crude oil and petro chemicals {2}

WEEK 11&12: Revision and examination.

WEEK 1: THERMAL ENERGY.

Energy the mainspring of all of life and of all activities of mankind.

Thermal energy or heat energy is a form of energy. It is a form of energy which tends to move from one place to another, especially from its source to cooler areas. It thus a spontaneous flow of energy from one object to another, caused by difference in temperature between two objects.

Thermal energy is the energy that comes from heat. This heat is generated by the movement of tiny particles within an object. The faster these particles move, the more heat is generated. Stoves and matches are examples of objects that conduct thermal energy.

Interesting Thermal Energy Facts:

Thermal energy is a part of the total energy of any object.

Thermal energy is related to the temperature of an object.

The joule is the unit used to measure thermal energy.

Unlike other forms of energy, thermal energy is difficult to convert to other forms of energy.

When thermal energy is transferred from or to an object, it is called heat.

Since heat is known as a process, objects cannot contain heat. Objects contain thermal energy.

In order to convert thermal energy into other forms of energy, a machine such as an engine is needed.

Unlike other forms of energy, the amount of thermal energy is not dependent upon the amount of work an object performs.

As heat from Earth is lost to space, it is replaced by heat brought by the Sun.

Although he was not the first to use the term thermal energy, James Joule receives credit for being the first to discuss the loss and gain of heat.

When you add ice to a warm drink, some of the drinks' thermal energy is transferred to the ice which makes the drink cooler.

Heat and temperature are not the same thing because temperature is related to how hot or cold something is.

Heat energy can be transferred by three ways: convection, conduction, and radiation.

Conductors, such as metals, are objects that allow thermal energy to move easily through them.

Insulators, such as plastic, are objects that do not allow thermal energy to easily move through them.

EVALUATION:

1. Write another name for Thermal

2. mention ten metals around you.

WEEK2: THERMAL ENERGY {2}

Thermal energy is a term used to describe the energy content of a system related to heating effects such as temperature increase or decrease.

Transfer of heat energy.

Heat energy can be transmitted in three different ways:

1. Conduction
2. Convection
3. Radiation

1. **Conduction**: this is the process by which heat energy is transferred from a region of higher temperature to a region lower temperature along a stationary solid material i.e. heat flows from a hot body to a cold body by itself. The heat flows by passing from one particle to the next along the stationary solid material.



The mean position of the molecules or particles of the solid material does not change. Conduction is the only means of heat transfer in solids.



GOOD AND BAD CONDUCTORS.

Good conductors are substances that allow heat energy to pass through them easily. Examples are metals like iron, copper, lead, aluminum and zinc. All metals are good conductors are substances that do not allow heat energy to pass through them easily. They are known as insulators. Examples are: wood,

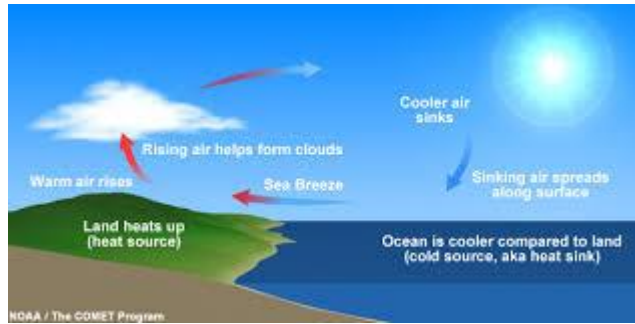
plastics, cotton, cork rubber, ceramics and water. Liquids and gases are poor

EXAMPLES	
GOOD CONDUCTORS (Poor insulator)	INSULATORS (Poor conductor)
Silver	Wood
Copper	Wool
Aluminum	Paper
Iron	Cork
	Plastic
	Air
	

conductors of heat.

2. **CONVECTION:** convection is the process by which heat energy is transferred from one part of a fluid [liquid or gas] to another, by the actual movement of the molecule of the fluid. Molecules of water that is being heated acquire energy and rise with the heat energy. The molecules of cool water above sink to replace the molecules of rising hot water at the bottom to become heated. This circulation of the fluid [liquid or gas] when heated is called **convection current**. Convection occurs in liquids and gases but not in solids. Convection currents are more easily set in gases, because gases expand more readily when heated. Examples of convection in nature include:





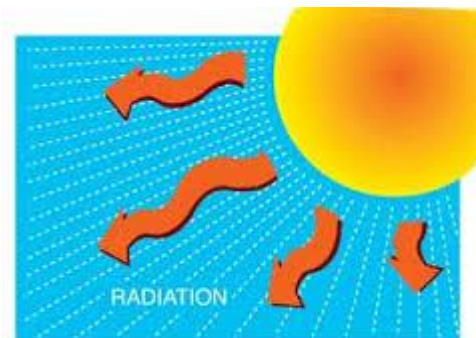
I. Land breeze and Sea breeze.

LAND BREEZE	SEA BREEZE
NIGHT	DAY
COOL AIR SINK ON LAND (HIGH PRESSURE)	WARM AIR EXPAND AND RISE ON LAND (LOW PRESSURE)
WARM AIR EXPAND AND RISE ON SEA (LOW PRESSURE)	COOL AIR SINK ALONG SEA (HIGH PRESSURE)
WIND BLOWS AN AREA OF LOW PRESSURE TO HIGH PRESSURE	WIND BLOWS AN AREA OF HIGH PRESSURE TO LOW PRESSURE
WIND BLOWS FROM THE LAND TOWARDS THE SEA	WIND BLOWS FROM THE SEA TOWARDS THE LAND

II. Wind system.

3. **Radiation**: This the process by which heat energy is transferred from one place to another, without the aid of a medium.

That is unlike in conduction and convection the medium does not play an active part in radiation process. Heat from sun travels by waves through space to the earth by radiation. Dull, black surfaces are best absorbers of heat radiation while brightly polished surfaces are poor absorbers.



EVALUATION:

1. Mention the three ways in which heat travels.
2. Define Thermal energy.
3. State the effect of thermal energy.
4. Define the following terms: Conduction, Convection and Radiation.

WEEK 3: REPRODUCTIVE HEALTH

Reproductive health is a state of complete physical, mental and social well being in all matters relating to the reproductive system, its function and its process.

It is the ability to have satisfying and sex life, capability to reproduce and freedom to decide if when and how to do so.

This refers to ensuring the optimization of the care of processes by which human beings can produce offspring.

GENECTIC COUNSELLING

Genetic counseling is the process by which parents or relatives, at risk of an inherited disorder, are advised of the consequences and the nature of the disorder, the probability of developing or transmitting it, and the options open to them in management and family planning in order to prevent or avoid it.

Genetic counseling is the process of evaluating family history and medical records, ordering genetic tests and evaluating the results of this investigation, as well as helping parents understand and reach decision about what to do next.

Genetic counseling should be done in a safe centre as hospital where the pregnant woman will be told about sex determination of a baby and the effects of genetics on a baby's eye, hair, skin, color, height etc. this will help people with genetic disorder make decisions about having children. It is important for intending couple to seek genetic counseling before marriage and find out if there are genetic disorders in their families.

BREAST FEEDING: The breast secretes colostrum for the first few days (after delivery) which is high in protein and believed to give the baby temporary immunity against infectious diseases. It is also important to note that substances ingested by the mother may be transmitted through the milk to the infant. The nursing mother must be therefore be cautious about using alcohol and other drugs.

ADVANTAGES OF BREAST FEEDING.

- I. It is very cheap
- II. it is readily available

- III. breast milk is at normal temperature
- IV. It helps the uterus or womb to go back to its normal place soon after delivery.
- V. There is no risk of contamination
- VI. It promotes the emotional connection between mother and child.

MYTHS OF BREAST FEEDING

The following are myths about breast feeding and should be dispelled:

- I. Processed milk is the better than breast feeding.
- II. Once you are still breast feeding, you cannot get pregnant.
- III. If you have sexual intercourse when you are breast feeding, the baby will suck sperm in the breast milk.

MODE OF TRANSMISSION OF HIV

Human immune-deficiency virus (HIV) has a specific transmission pattern. HIV is spread when blood, semen or vaginal secretion of an infected person comes in contact with the blood or mucus membrane (the inner lining of the vagina, anus, urethra etc.) of a healthy person. This transmission can happen in any of the following ways:

1. By having unprotected sex with an infected person. The sexual intercourse can be:
 - I. Man with man (homosexuals) - penis of an infected man into the anus of another man.
 - II. Man with woman (heterosexuals) – normal genital sexual intercourse.
 - III. Men and woman having sexual intercourse outside the marriage.
 - IV. In a polygamous set up where a number of the polygamous set up is infected.
2. Through transfusion of an HIV infected blood to an un-infected person.
3. Through a cut by an infected unsterilized sharp instrument (like knives, razor blades, clippers etc.) during hair-cut male and female circumcisions and other related practices.
4. Through injection with an infected needle.

5. By sharing unsterilized injection needles as it happens in intra-Venus injection among drug addicts.
6. By oral sex [sucking the penis or vagina of an infected person]
7. From an infected pregnant mother to her baby in the womb (umbilical cord) or during birth.
8. Through HIV – infected breast milk of an infected mother to her breast feeding baby.
9. Artificial insemination.
10. Sharing tooth brushes and chewing sticks: this is possible when there is a wound of the infected person and the healthy person.

PREVENTION AND CONTROL OF HIV.

The HIV epidemic continues to expand in all regions and communities.

However, infection can be prevented by using ABC approach to safer sex and by other control measures.

1. **A- abstinence**: it means not engaging in any sexual behavior that would lead to sharing of body fluids. Young people reduce their risk of HIV infection when they are able to delay their first encounter. Abstinence is safest, simplest, most effective and easiest method to prevent HIV and other STI's.
2. **B-Be faithful**: faithfulness to one uninfected partner will prevent HIV infection. In polygamy, the husband and wives should remain mutually faithful.
3. **C- Condom use**: Regular and correct uses of condoms provide a high level of protection against HIV infection (this is not 100% safe).
4. Avoid sharing or re-using injection needles.
5. Avoid sexual intercourse with the infected partner.
6. Avoid sexual intercourse with someone known to have multiple partners.
7. Avoid sharing tooth brushes, chewing sticks, razor blades or clippers.
8. Before marriage, both partners should test their blood to make sure they are both free from HIV.

9. National mass campaign to educate everyone on the danger of HIV, how it is spread and how to avoid.

EVALUATION:

1.What is Genetic counseling?

- 2.Mention two genetic disorders you know.
- 3.What do you understand by the word breastfeeding.
- 4.Mention three advantages of breastfeeding.
- 5.What is the full meaning of H.I.V?
- 6.List three mode of transmission and prevention of H.I.V

WEEK4: ABSTINENCE

MEANING OF ABSTINENCE:

It is defined as the practice of restraining oneself from indulging in something, typically alcohol or sex.

It can also be defined as the abstention from sexual intercourse. It is a self enforced restraint from indulging in bodily activities that are widely experienced as given pleasure.

TYPES OF ABSTINENCE.

- 1) **lifelong abstinence**
- 2) **Delayed abstinence**
- 3) **Periodic** abstinence

PERIODIC ABSTAINENCE:

Also known as fertility awareness, natural family planning, and the rhythm method, this approach entails not having sexual intercourse on the days of a woman's menstrual cycle when she could become pregnant or using a barrier method (such as a condom, the diaphragm or a cervical cap) for birth control on those days.

DELAYED ABSTINENCE:

Abstaining from sex and/or delaying sexual initiation are important outcomes for sex education programs, although these outcomes may be difficult to achieve. Delaying sexual initiation is a reasonable goal when working with youth who have not generally begun to engage in sexual behavior. Increasing sexual abstinence is a reasonable goal for programs working with any population of sexually active teens.

LIFE LONG ABSTINENCE:

Lifelong (or at least long-term) abstinence, often associated with philosophical or religious asceticism, is distinguished from chastity before marriage. Abstinence is often viewed as an act of self-control over the natural desire to have sex. The display of the strength of character allows the abstainer to set an example for those not able to contain their "base urges." At other times, abstinence has been seen as a great social skill practiced by those who refuse to engage with the material and physical world. Some groups that propose sexual abstinence consider it an essential means to reach a particular intellectual or spiritual condition, or that chastity allows one to achieve a required self-control or self-consciousness.

SKILLS AND BEHAVIOURS OF ABSTINENCE

1. **DECISION MAKING:** individual must possess a strong determination not to engage in immoral act before marriage.
2. **SELF CONTROL:** self discipline is an essential factor that will help individual not to be part of such dirty act.
3. **AQUIRE KNOWLEDGE AND INFORMATION;** knowing fully well about the consequences of sexual intercourse and having a deep knowledge of it, help one to stay away from it.
4. **ADVANCED PREPARATION;** identify cases and situations that may lead you to engage in it and find out best ways of working against them.

5. **COMMUNICATION:**As an individual we should come to the knowledge of the consequences and also we should be able to have a meaningful discussion with anyone wanting to lure you into immoral affairs such discussions will surely help you to desist from such individual.

REASONS WHY YOUNG PEOPLE MUST ABSTAIN FROM PRE-MARITAL SEX.

1. It breaks God's laws and dishonors Him—search a concordance for the word “fornication.” We could stop here—it's all we really need to know.
2. It presents huge physical risk—diseases and illness are rampant among those who engage in this lifestyle.
3. It presents huge emotional risk—a physical and emotional bond without a spiritual commitment is never a winning experience.
4. It presents huge spiritual risk—grieving the Holy Spirit and offending a holy God means we forfeit God's best. We never win by dishonoring God.
5. It is awkward, guilt ridden, unfulfilling, and not representative of God's original intent—hence a culture that continually seeks fulfillment with new partners and relationships.
6. It is disappointing at the physical, emotional, and spiritual levels—the only physical intimacy that exceeds expectations is that founded on long-term commitment and marital growth.
7. It creates a spiritual/emotional bond without commitment—this only breeds resentment, bitterness, and the feeling of being used. It says something like this, “I don't love you enough to commit to you, but I love me enough to use you.”
8. It destroys trust—the best way to have trust in a marriage is to stay pure before you get married. Learning to be committed to Christ (in purity) is the best way to learn to be committed to a spouse.
9. It creates resentment and frustration—it was designed to happen within a committed marriage of selfless love. Outside of that, fornication just breaks the heart and wounds the soul.

10. It leaves you empty and searching for real love—physical intimacy doesn't create a loving, committed relationship, it's the fruit of one.

11. It devalues the future intimacy of your marriage—intimacy is “just the two of us.” Premarital relationships destroy that before it even happens.

12. It prevents the greatest intimacy in marriage—the purest and most fulfilling marital relationship is that which is forever untouched by previous relationships. (If you have failed morally, don't lose hope. Claim God's grace, and begin protecting your future marriage today by abstaining from further fornication.) Jesus doesn't shame you, but He would say, “Go and sin no more.”

13. It sets a person on a path of unfulfilling sexual experiences—fornication is a downward spiral of perpetually unfulfilling relationships.

14. It attempts to shortcut God's plan for marriage and family—it turns God's great gift of family and love into a cheap thrill and self-centered pleasure quest.

REASONS WHY YOUNG PEOPLE ENGAGE IN PRE MARITAL SEX.

(1) **Pressure:** Pressure from parents, friends, peer group, lecturer, boss, future partners. Some men do mount pressure physically on their partners while some ladies mount pressure on their partners by dressing carelessly exposing their nakedness to seduce men. Some male bosses in places of work do mount pressure on their female workers, they want girls that can work for them and still satisfy them sexually.

(2) **Curiosity:** Many youths have engaged themselves in premarital sex as a result of curiosity. They thought they were searching for reality, but they ended up destroying themselves. They are not satisfied with what their parents, pastors and Christian friends told them concerning sex, they want to experience it themselves.

(3) **Electronic media:** Television, film, radio and video has contributed to the high rate of premarital sex. What youths watch on screen determine their behavior and character. Every product advertised on T.V. is just promoting sex. In fact, to advertise food items they use sex, film, television and radio promotes premarital sex. Most home videos are sex promoters.

(4) **Books and Magazines:** Some satanic authors are in town destroying the youths, they write some sexual stories, books and magazines, and they bring out many pictures that stimulate the youth to think about sex always. Having read all these books, youths do become restless until they have put into practice what they learned in the books and magazines.

(5) **Environmental influence:** We live in a corrupt society where people do not see anything bad in ungodliness they do not see premarital sex as sin; they see it as a normal thing. Hence, girls are encouraged to dress exposing their bodies. Premarital sex has become the norm of the society. Some Christian youths find it difficult to cope in this kind of environment; hence, they fall into this ungodly act.

(6) **Covetousness:** Greed for money, wealth and position is another cause of premarital sex. Some ladies want money at all costs hence they are ready to use their bodies to get it by sleeping around with men.

(7) **Indiscipline:** Lack of discipline has led many singles into the dungeon of premarital sex.

(8) **Wrong association:** This has led many youth into destruction. Show me your friends and I will tell you who you are.

(9) **Ignorance:** Lack of good sex education has led many youth into premarital sex; some went into it not knowing what they were doing.

(10) **Wrong information:** Since parents have refused to educate their children on the subject and the church is not forth coming with anything meaningful, the youth have resorted to any information they can get from anywhere either wrong or right.

(11) **Bad parenting:** Children that are not well brought up are likely to fall into wrong hands.

(12) **Idleness:** An idle hand is the devil's workshop. If you are idle, you may cuddle the devil.

(13) **Loneliness:** Some claim they went into fornication due to loneliness.

(14) **Broken homes**: Children from broken homes can fall into wrong hands due to the situation of their homes.

15. **It prevents you from having the most fulfilling sexual relationship**—while a person is sleeping around, they are NOT preparing for the wonderful lifetime relationship that God intended.

16. **It enlarges sexual desires and makes them insatiable**—thinking with your hormones allows them to become an unruly taskmaster.

17. **It puts the flesh and hormones in control of your life**—you are more than a chemical reaction that seeks gratification. Don't allow your life to be directed by physical desires. Submit those desires to the Holy Spirit, and let them be fulfilled in God's time and in God's way.

18. **It creates children without strong homes**—God intends this relationship to create a family with a foundation of commitment and lifetime love.

19. **It feeds the abortion industry**—illicit relationship creates unwanted children which creates “the abortion industry.”

20. **It cannot be done safely**—no matter what culture says safe sex is one man, one woman, committed in marriage, for the rest of their lives.

FACTS ABOUT ABSTINENCE

- Sexual activity at an early age has multiple harmful consequences.
- Sexual health education does not teach students how to have sex.
- Teaching sexual health in school does not replace it from being taught at home.
- Comprehensive sexual health education does not lead to increased rates of sexual behavior in adolescents.
- Students in elementary are not too young to receive or inquire about information on sexual health.
- Comprehensive sexual health education does teach abstinence.
- Condoms are very effective in preventing pregnancy and STI.
- Kids may not pick up what they need to know.
- If you talk to kids about sex they are less likely to experiment.
- Students are exposed to sex and sexuality whether we talk about it or not.

- It is not better to avoid teaching sexual health, even if you don't feel completely comfortable with the topic.

MYTHS ABOUT ABSTINENCE

There are a number of confusions about sexuality education, one of which is defining it as “sex education”. The word “sex” is used in our culture to mean sexual intercourse. “Sexuality” is a much broader word and its meanings include sexual values and decision-making, biology, emotions, gender identity, sex roles, relationships and feelings. It’s often difficult to talk with our children about sexuality, in part because most of us didn’t have parents who discussed it with us. Therefore, we lack models of positive sexuality educators. Also, we may believe some of the following myths.

Myth: Students in elementary are too young to need information about sexuality.

Fact: In every subject, students are given a foundation in the early school years that is expanded upon in later years. Children are often curious about issues related to sexuality and need accurate, age-appropriate information. Children also need to learn the correct names of all their body parts so that they can tell someone if they have been sexually abused.

Myth: If you talk to kids about sex they will go out and experiment.

Fact: Children who are well informed and comfortable talking about sexuality with their parents are also the least likely to have intercourse when they are adolescents. Knowledge does not lead to inappropriate behavior, whereas a lack of information poses greater risks.

Myth: Kids will pick up what they need to know.

Fact: Kids are constantly picking up sexual messages, many of them ones that do not promote healthy sexuality. They will pick up the commercial and exploitive messages that are in the interest of advertisers to promote, and they will pick up misinformation from their uninformed peers. From adults, they may pick up the message that there is something wrong with feeling comfortable about sexuality.

Myth: If I don't feel completely comfortable talking to my students about sexual issues, it's better not to say anything at all.

Fact: It is quite common to be uncomfortable talking about sexuality. However, we should not let this stop us from educating our students. It is important for educators to provide comprehensive Sexual Health Education that is culturally and socially appropriate, and that meets students' needs. Talking about facts rather than values is an effective way to combat apprehension. Educator training is an effective method for developing comfort and skill.

Myth: Comprehensive sexual health education doesn't address abstinence.

Fact: Comprehensive Sexual Health Education stresses abstinence as the preferred sexual behavior among teens. Abstaining from sexual activity that involves exchange of bodily fluids and/or genital-to-genital or skin to genital contact is the only way to be absolutely sure of avoiding the risk of pregnancy or sexually transmitted infections. Postponement of initial sexual activity until maturity, adherence to one sexual partner and protected sexual intercourse are sequentially offered as the next best alternatives. The programs that have been most effective in helping young people to abstain discuss both abstinence and contraception.

EVALUATION:

- 1.** Define abstinence
- 2.** State myths and facts about abstinence.
3. Mention reasons why adolescence do not abstain.
4. Identify some skills and behavior that promote abstinence.
5. Explain reasons why young people engage in pre marital sex.

WEEK 5: CHEMICALS

DEFINITION OF A CHEMICAL:

A chemical is a distinct compound or substance especially which has been artificially prepared or purified.

A chemical is any basic substance that is used in or produced by a reaction involving changes to atoms or molecules.

CLASSES OF CHEMICALS.

Chemicals can be divided into two classes;

- 1) Chemicals based on use.
- 2) Chemicals based on hazardous nature.

Chemicals based on use include the following;

- I. Pharmaceuticals.
- II. Cosmetics.
- III. Nuclear.
- IV. Agro chemicals.
- V. Industrial chemicals.
- VI. Laboratory chemicals.

Chemicals based on hazardous nature;

- a. Highly hazardous and toxic chemicals.
- b. Moderately hazardous and toxic chemicals.
- c. Non- hazardous and toxic chemicals.

EXAMPLES OF HAZARDOUS AND TOXIC CHEMICALS:

- I. Ammonia
- II. Bleach
- III. Over cleaner(sodium hydroxide)
- IV. Toilet bowl cleaners (hydrochloric acid).
- V. Car wash and polish
- VI. Lice shampoo
- VII. Flea powders
- VIII. Pesticides

- IX. Tar and bug remover
- X. Sodium or calcium hypochlorite.
- XI. Triclosan
- XII. Formaldehyde
- XIII. Phenol
- XIV. Nitrobenzene
- XV. Trichloroethane
- XVI. Perchloroethylene
- XVII. Sulphuric acid
- XVIII. Cytotoxic agents
 - **EVALUATION:** define chemicals
 - Classify chemicals based on the following:
 - Use

- Hazardous nature

ASSIGNMENT: Explain why bottles should be labelled.

WEEK 6: SAFETY MEASURES

The following are safety measures to be taken when using chemicals:

- Safety gadgets are to be worn whenever working with acid, bases or any flammable material.
- Let the instructor know immediately about any glassware breakage or chemical spills that may occur, so that proper clean up procedures can be instituted.
- Adhere to the manufacturer's safety instructions.
- Follow safety guidelines for chemical storage and handling.
- Observe and adhere to safety signs.
- Observe and adhere to instructions on chemical packages.
- Ensure proper labeling of chemicals.
- Ensure proper storage of chemicals.
- No eating, drinking or smoking where chemicals are used.
- Skin should be covered with protective clothing.

- Clothing should be removed immediately it gets wet or contaminated with a chemical.
- Eyes or skin should be washed with plenty of water after an accident.
- Face mask may be used in toxic dust or gases.
- Before starting work with a chemical a “chemical hazard pocket guide” should be consulted for necessary information about the chemical.
- Whenever a dust allergy or respiratory problem precipitates the worker should immediately be removed from the work place and put under proper health care.
- In case of inflammable gas or solvent leakage the exhaust fans should be started and all the source of fire should be extinguished.
- Workers working in antibiotic related products must be changed routinely so that an individual is not exposed to a certain antibiotic for a long period of time.

EVALUATION:

1. What do you understand by the word chemicals?
2. List two chemicals each that can be found in each of the following.
 - i. Pharmaceuticals, Agrochemicals, Industries
3. Why is it important to adhere to the safety measure when using chemicals.
4. Define safety.

WEEK 7&8: DRUG ABUSE

A drug can also be defined as any substances other than any other than food that by its chemical or physical nature, can affect the structure or functions of a living organism.

When drugs are administered under proper medical supervision they can serve three objectives namely

- I. To save life
- II. To relieve suffering
- III. To combat diseases {fight against diseases}

However, when drugs are misused or abused, they can be harmful to the human body or even cause death.

THE CONCEPT OF DRUG ABUSE

Drug abuse can come under two major dimensions. One of this is the overuse and over dependence on prescription drugs. Many people depend heavily on and over use drugs such as paracetamols, panadols and other relieving drugs etc. this is one aspect of drug abuse. The other aspect is the use of hallucinogenic drugs which give the users a strange (high) feeling during which they may not have control over their senses. Such drugs include Indian hemp, cocaine, heroine, marijuana etc. These drugs are often expensive and not readily available. For these reasons, many reasons, many people resort to using other substances (thinners, glue, petrol etc) to have the same effect.

COMMON WAYS OF MISUSING DRUGS

- Such drugs which people develop an urge to take are called habit-forming drugs.
- Common ways of using these drugs are by smoking and inhaling (Indian hemp, cocaine, thinners, glue, petrol etc.)
- Sometimes these drugs can also be in liquid form (heroine) which is injected into the blood stream with the use of syringes.

SOCIAL RISK FACTORS IN DRUG ABUSE

Negative peer influence among school children often lead to drug abuse which makes them perform poorly in school and eventually drop out.

- 1) _The effects of a drug may be temporary or it may last long time, depending on the amount taken.
- 2) _The incidents of drug abuse have a very negative impact on individuals, families and society.
- 3) Individuals who take drugs become problems to themselves and their families.
- 4) Drug abuse is also known to be a major contributing factor to road accidents.

- 5) Drug abuse can lead to break up of marriages if the users are adults and are married.
- 6) The overall impact of drug abuse is on the society and government.

EVALUATION

1. Explain the meaning of drug and drug abuse.
2. State methods of drug use.

3.List common ways of misusing drugs.

4. Mention social risks factors in drug abuse.
5. Name any kind of commonly abused drugs.

WEEK9: CRUDE OIL AND PETROCHEMICALS (1)

The petroleum that comes out from oil production is a mixture of liquid, gaseous and solid hydrocarbon found naturally underground.

Hydrocarbons are compounds containing carbon and hydrogen only. Crude oil is the liquid form of the unrefined petroleum. It is a dark brown or greenish flammable liquid. It consists of a complex mixture of various hydrocarbons that differ in appearance, composition and purity. Crude oil also contains small particles of materials such as sulphur and metals. Other forms of petroleum are natural gas, which is stored in cylinders and used for cooking and bitumen used for tarring our roads.

PETRO CHEMICALS

These are chemical compounds which are derived from the refining of petroleum. For example, methane is a refinery product which is used to produce carbon black and gas. Other examples of petrochemicals include;

- 1) Ethane and propene
- 2) Plastics such as polythene, synthetic fibres (nylon), rubber, etc
- 3) Detergent
- 4) Chemicals used for manufacturing of paints, medicine, insecticides, herbicides, nematicides, rodenticides, avicides etc.

The process of deriving these petrochemicals involves the refining of crude oil, treatment of the crude fractions and finally production of the organic compounds that could form the bases of other industrial productions.

REFINING OF CRUDE OIL

Crude oil produced from rock is piped straight into oil storage tanks. From the storage tanks crude oil is transported to the refinery where it is separated into its components. Since crude oil is a mixture, a physical method of separation is used. This method is called fractional distillation.

The fundamental process is the refining that separates crude oil into its components has different boiling points. The refining process therefore involves fractional distillation of crude oil into fractions, purification and conversion of the fractions into more useful products.

The fractional distillation refining process involves the following steps:

- I. Heating the crude oil in gas furnace at a high temperature of 500°C to 600°C by passing it through heating pipes in the gas furnace.
- II. The vapour is passed into a tall fractionation tower, the temperature of which varies from 400°C at the top.
- III. Fractions of crude oil are collected from the different temperature levels in the trays of the tower. Each tray usually contains many bubble caps through which the vapors with similar boiling temperature pass and condense. The most volatile components are collected at the bottom of the tower.

These fractions can be differentiated from one another by their different texture, color, odor, volatility and ease of ignition and burning. Nigeria has a lot of crude oil which is distilled in refineries to give us useful products which include:

- I. **PETROLEUM GAS OR REFINERY GAS:** this is obtained at the uppermost part of the tower. It is the product with the least boiling point.
- II. **PETROL OR GASOLINE:** this is the second product with relatively high temperature range and a number of carbon constituent than the refining gas.
- III. **NAPHTHA:** this has a high number of carbon atoms per molecules than petrol and it is usually further refined to give petrol.

- IV. **KEROSINE OR PARAFFIN OIL:** it is a liquid with higher viscosity than both gasoline and naphtha.
- V. **LIGHT GAS (DISEASL OIL OR GAS OIL):** it is a very viscous product.
- VI. **HEAVY GAS OIL:** it is more viscous than light gas, and it is usually colored.
- VII. **LUBRICATING OIL, FUEL OIL AND BITUMEN:** they are usually referred to as residues; they are thick and non-volatile products.

CRUDE OIL FRACTIONS AND ITS USES

<u>FRACTIONS</u>	<u>NUMBER OF CARBON ATOMS PER MOLECULES</u>	<u>BOILING POINT RANGE</u>	<u>USES</u>
<u>Natural gas</u>	C ₁ -C ₅	BELOW 40°C	Sold as cooking gas, source of other chemicals.
<u>Petrol/gasoline</u>	C ₅ -C ₁₀	40°C-175°C	Main source of fuel for internal combustion engine.
<u>NAPHTHA</u>	C ₅ -C ₁₀	40°C-175°C	used as chemical feed stock; Refined to give

			more gasoline.
<u>LIGHT GAS</u>	C ₅ -C ₁₀	40°C-175°C	Used as heating oil. Used in high speed diesel engine
<u>KEROSENE</u>	C ₅ -C ₁₄	175°C-250°C	Used as heating and lightning oil. As fuel for aircraft. It can be used to produce gasoline.
<u>DIESEL OIL</u>	C ₁₄ -C ₁₈	340°C	Used as fuel for slow speed engines e.g. diesel engine. It can be used to produce gasoline.
<u>LUBRICATING OIL</u>	C ₁₈ -C ₄₀	400°C-475°C	Used as lubricants, production of candles

<u>ASPHALTS AND BITUMEN</u>	C ₁₄ and above	500°C	and waxes. Road surfacing, roofing
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EVALUATION

1. Explain what crude oil and petrochemicals are.

2. Describe the process of refining crude oil.

3. Find the meaning of the following terms:

1. Crude oil exploration
2. Crude oil refining
3. cracking

4. List five by-products of refined crude oil.

5. What are the importance of petrol chemicals?

WEEK 10: CRUDE OIL AND PETROCHEMICALS

USES OF PETROCHEMICALS

Petrochemicals are used as raw materials for industrial production of essential materials such as:

- I. Raw materials for the production of polymers (plastics), paints, synthetic rubber and textiles.
- II. Food additives
- III. Cosmetics
- IV. Pesticides
- V. Fertilizers.

IMPORTANCE OF CRUDE OIL AND PETROCHEMICALS.

- I. **SOURCE OF INCOME:** it serves as a major source of income in Nigeria and other oil exporting countries.
- II. **SOURCES OF ENERGY:** energy for heating and for motor vehicles can be gotten from crude oil.
- III. **EMPLOYMENT OPPORTUNITIES:** its exploration and exploitation (refining, distribution, marketing, exportation, etc.) create employment opportunities.
- IV. **RAW MATERIALS FOR INDUSTRIES:** products are sources of industrial raw materials, thus making our industries functional.

EVALUATION

1. State the uses and importance of crude oil and petrochemicals.
2. State the materials that can be derived from the following:
 1. Crude oil
 2. Petroleum wax
3. mention one use of Gasoline