



## SECOND TERM E-LEARNING NOTE

**SUBJECT: BASIC SCIENCE**

**CLASS: JSS 1**

### SCHEME OF WORK

WEEK	TOPIC
1 – 2.	REPRODUCTIVE SYSTEM
3.	HUMAN REPRODUCTION I
4.	HUMAN REPRODUCTION II
5.	CONSEQUENCES/IMPLICATION OF TENAGE PREGNANCY
6.	SEXUALLY TRANSMITTED INFECTIONS ( STIs)
7.	HIV / AIDS I
8.	HIV / AIDS II
9.	ENERGY
10.	RENEWABLE ENERGY

### REFERENCE

Precious Seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK 1

### WEEK ONE AND TWO

DATE: .....

### TOPIC: REPRODUCTIVE SYSTEM

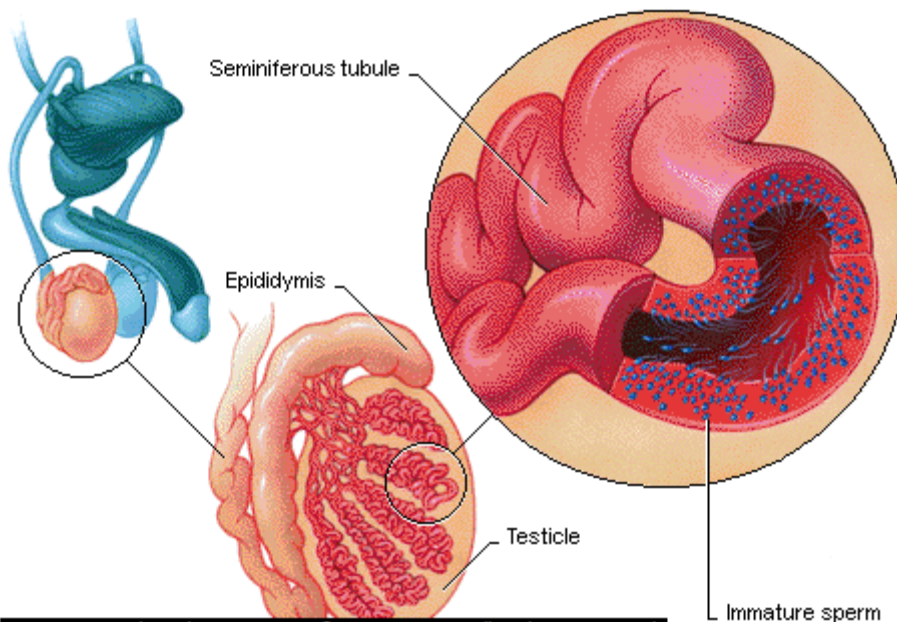
#### CONTENT

Reproductive System is a term applied to the group of plant or animal organs that are necessary for or that are accessory to the reproductive processes. Reproduction, process whereby all living organisms produce offspring. Reproduction is one of the essential functions of plants, animals, and single celled organisms, as necessary for the preservation of the species as eating is for the preservation of the individual.

The basic units of sexual reproduction are the male and female germ cells; this article deals with the organs within which the germ cells of animals mature and are stored, the organs through which they are transported in the process of producing a new individual, and accessory glandular organs.

#### Internal View of Male Reproductive System

The reproductive anatomy of the male human is largely external. Beginning at puberty, sperm are produced within seminiferous tubules of the testicles, a pair of glands that reside in a pouch called the scrotum. The external location of the scrotum keeps the temperature of sperm slightly below body temperature, which is necessary for their healthy development and survival. From each testicle, sperm migrate to a long, coiled tube known as the **epididymis**,



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where they are stored for one to three weeks until they mature. Also located outside the body is the penis, the erectile organ responsible for the excretion of urine and the transfer of sperm to the vagina of the female. Just before ejaculation during sexual arousal, mature sperm travel from the epididymis, a coiled tube behind each testicle, through a long duct called the **vas deferens**. Sperm leave the body in semen, a fluid produced by the seminal vesicles.

There are two testes. Each is oval in shape and is housed in a wrinkle sac called **scrotum** which hangs out of the body behind the penis. The scrotum functions as a thermoregulator that protects the sperm from high temperature.

## EVALUATION

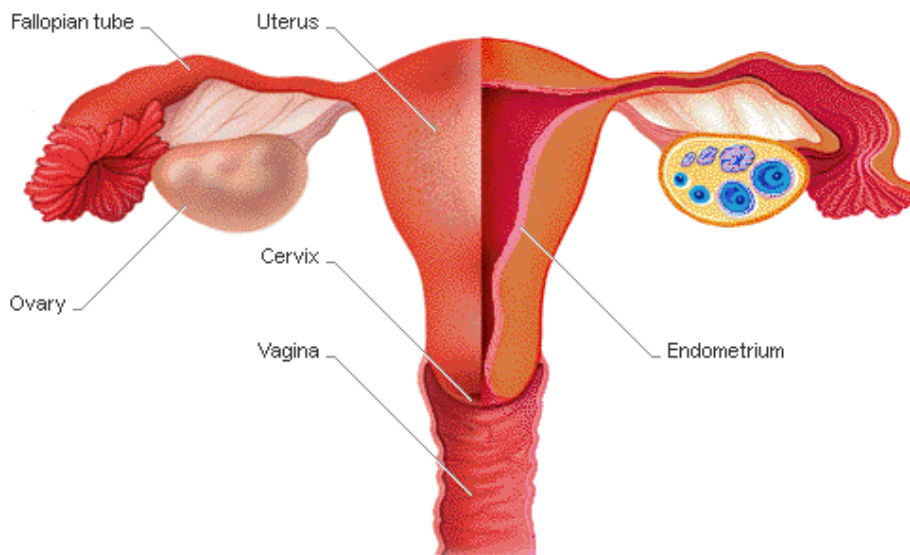
1. What do you understand by the term 'thermoregulator'?
2. What is epididymis?

**Primary sexual characteristics** of women include the external genital (vulva) and the internal organs that make it possible for a woman to produce ova (eggs) and become pregnant. The vulva includes the *mons pubis*, the most visible part of the woman's external genitalia, which is the pad of fatty tissue that covers the pubic bone and is commonly covered by pubic hair; the outer *labia*, the large outer lips; and the inner *labia*, the smaller, hairless inner lips that run along the edge of the vaginal opening and often fold over to cover it. The inner labia come together in front to form the clitoral hood, which covers the *clitoris*, a sensitive organ that is very important to the woman's sexual response. The opening of the *urethra*, the tubular vessel through which urine passes, is located midway between the clitoris and the vaginal opening. The area where the outer labia join behind the vagina is called the **frenulum of labia minora**. The area of skin between the vaginal opening and the anus is the *perineum*. The *hymen* is a thin membrane that partially covers the vaginal opening. If the hymen is extensive and is still present at first intercourse, it may be broken or stretched as the penis enters the vagina and some bleeding and pain may occur,



although more typically its presence is unnoticed. The presence or absence of a hymen is not a reliable indicator of virginity, although historically it was viewed as such.

**The internal sex organs of the female consist of the vagina, uterus, fallopian tubes (or oviducts), and ovaries.** The *vagina* is a flexible tube-shaped organ that is the passageway



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between the uterus and the opening in the vulva. Because during birth the baby travels from the uterus through the vagina, the vagina is also known as the birth canal. The woman's menstrual flow comes out of the uterus and through the vagina. When a man and a woman engage in vaginal intercourse, the penis is inserted into the vagina.

The **cervix** is located at the bottom of the uterus and includes the opening between the vagina and the uterus. The **uterus** is a muscular organ that has an inner lining (endometrium) richly supplied with blood vessels and glands. During pregnancy, the uterus holds and nourishes the developing foetus. Although the uterus is normally about the size of a fist, during pregnancy it is capable of stretching to accommodate a fully developed foetus, which is typically about 50 cm (about 20 in) long and weighs about 3.5 kg (about 7.5 lbs). The uterine muscles also produce the strong contractions of labour.

At the top of the uterus are the pair of *fallopian tubes* that lead to the ovaries. The two *ovaries* produce eggs, or ova (the female sex cells that can become fertilized), and female sex hormones, primarily estrogens and progesterone. The fallopian tubes have finger like projections at the ends near the ovaries that sweep the egg into the fallopian tube after it is released from the ovaries. If sperm are present in the fallopian tube, fertilization (conception) may occur and the fertilized egg will be swept into the uterus by *cilia* (hair like projections inside the fallopian tube).

## EVALUATION

1. Where is the location of cervix?
2. What do you understand by the term "*frenulum of labia minora*"?

## GENERAL EVALUATION

1. Define epididymis
2. What are the internal sex organs of the female?
3. Where is the location of cervix?



4. What do you understand by the term “*frenulum of labia minora*”?

## Precious seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK PAGE 123-125

### WEEKEND ASSIGNMENT

1. The ----- is a flexible tube-shaped organ that is the passageway between the uterus and the opening in the vulva. A. *vagina* B. *penis* C. *labor* D. *cervix*
2. At the top of the uterus are the pair of ----- *tubes* that lead to the ovaries. A. *fallopian* B. *uterus* C. *endometrium* C. *fetus* D. *cilia*
3. The fallopian tubes have ----- projections at the ends near the ovaries that sweep the egg into the fallopian tube after it is released from the ovaries. A. fingerlike B. needlelike C. babylike D. hairlike
4. If sperm are present in the fallopian tube, fertilization (conception) may occur and the fertilized egg will be swept into the uterus by----- A. *cilia* B. *fingerlike* C. *ovaries* D. *cervix*
5. The ----- muscles also produce the strong contractions of labour. A. uterine B. uterus C. *cilia* D. fallopian

### THEORY

1. Mention the Primary sexual characteristics of women
2. Define epididymis
3. What are the internal sex organs of the female?

### WEEK THREE

DATE: .....

#### TOPIC: HUMAN REPRODUCTION I

##### Meaning of menstruation

Menstruation, also known as a period or monthly, is the regular discharge of blood and mucosal tissue from the inner lining of the uterus through the vagina. The first period usually begins between twelve and fifteen years of age, a point in time known as menarche. However, periods may occasionally start as young as eight years old and still be considered normal. The typical length of time between the first day of one period and the first day of the next is 21 to 45 days in young women, and 21 to 31 days in adults (an average of 28 days). Bleeding usually lasts around 2 to 7 days. Menstruation stops occurring after menopause, which usually occurs between 45 and 55 years of age. Periods also stop during pregnancy and typically do not resume during the initial months of breastfeeding. A lack of periods, known as amenorrhea, is when periods do not occur by age 15 or have not occurred in 90 days. Other problems with the menstrual cycle include painful periods and abnormal bleeding such as bleeding between periods or heavy bleeding. The menstrual cycle occurs due to the rise and fall of hormones. This cycle results in the thickening of the lining of the uterus, and the growth of an egg, (which is required for pregnancy). The egg is released from an ovary around day fourteen in the cycle; the thickened lining of the uterus provides nutrients to an embryo after implantation. If pregnancy does not occur, the lining is released in what is known as menstruation.

##### Menstrual hygiene and cleanliness



1. Choose your method of sanitation
2. Change regularly
3. Don't use soap or any vagina hygiene product.
4. Wash yourself regularly
5. Use the right washing techniques
6. Discard your used sanitary product properly.
7. Beware of a pad rash
8. Use only one method of sanitation at a time.
9. Have a bath regularly.
10. Be ready with the on-the-go stuff during period.

## EVALUATION

1. What is the meaning of menstruation?
2. State five menstrual hygiene and cleanliness

## Ovulation

Ovulation is the release of egg from the ovaries. In humans, this event occurs when the de Graaf's 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. In addition, the uterine lining (endometrium) is thickened to be able to receive a fertilized egg.

## Signs of Ovulation

1. Check the calendar: Keep a menstrual calendar for a few months so you can get an idea of what's normal for you — or use tools that can help you calculate ovulation. If your periods are irregular, you'll need to be even more alert for other signs of ovulation, so read on.
2. Listen to your body: If you're like 20 percent of women, your body will send you a memo when it's ovulating, in the form of a twinge of pain or a series of cramps in your lower abdominal area (usually localized to one side — the side you're ovulating from. Pay close attention, and you may be more likely to get the message.
3. Chart your temperature: That is, your basal body temperature, or BBT. Taken with a special thermometer, your BBT is the baseline reading you get first thing in the morning, after at least three to five hours of sleep and before you get out of bed, talk, or even sit up. Your BBT will reach its lowest point at ovulation and then rise immediately and dramatically (about a half a degree) as soon as ovulation occurs. Your BBT changes throughout your cycle as fluctuations in hormone levels occur. During the first half of your cycle, estrogen dominates. During the second half of your cycle (once ovulation has occurred), there is a surge in progesterone. Progesterone increases your body temperature as it gets your uterus ready for a fertilized, implantable egg. Which means that in the first half of the month, your temperature will be lower than it is in the second half of the month, after ovulation.
4. Get to know your cervix: One detectable sign of oncoming ovulation is the position of the cervix itself. During the beginning of a cycle, your cervix — that neck-like passage between your vagina and uterus that has to stretch during birth to accommodate your baby's head —



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is low, hard, and closed. But as ovulation approaches, it pulls back up, softens a bit, and opens just a little, to let the sperm through on their way to their target. Some women can easily feel these changes, while others have a tougher time. Check your cervix daily, using one or two fingers, and keep a chart of your observations. The other cervical sign you can watch for is the appearance, increase in quantity, and change in consistency of cervical mucus (the stuff that gets your underwear all sticky). Its more noble purpose is to carry the sperm to the ovum deep inside you.

5. Buy an ovulation predictor kit: Ovulation predictor kits (OPKs) are able to pinpoint your date of ovulation 12 to 24 hours in advance by looking at levels of luteinizing hormone, or LH, which is the last of the hormones to hit its peak before ovulation actually occurs. All you have to do is pee on a stick and wait for the indicator to tell you whether you're about to ovulate.

Another option is a saliva test, which takes a peek at levels of estrogen in your saliva as ovulation nears. When you're ovulating, a look at your saliva under the test's eyepiece will reveal a microscopic pattern that resembles the leaves of a fern plant or frost on a windowpane. There are also devices that detect the numerous salts (chloride, sodium, potassium) in a woman's sweat, which change during different times of the month. Called the chloride ion surge, this shift happens even before the estrogen and the LH surge, so these tests give a woman a four-day warning of when she may be ovulating, versus the 12-to-24-hour one that the standard pee-on-a-stick OPKs provide.

No OPK can guarantee that you will get pregnant or that you're actually ovulating; they can only indicate when ovulation may be occurring. So no matter which device or method you choose, patience and persistence are key.

## EVALUATION

1. Define ovulation
2. State five signs of ovulation

## Fertilization and conception

After ovulation, the egg is swept into the fallopian tube and drifts along, brushed by waves of hairlike cilia toward the womb. The sperm will typically meet the egg in the lower quadrant of a fallopian tube and start to swarm around the egg. The ovum is covered by a protective field known as the zona pellucida, and in order for fertilization to take place, sperm cells must find a keyhole (or receptor) to unlock the zona pellucida, gain entrance, and burrow their way to the oocyte, the genetic core of the ovum. Only one sperm will connect with the oocyte, precipitating genetic combination – signaling that fertilization has just taken place. . At the moment of fertilisation, your baby's genetic make-up is complete, including its sex. Since the mother can provide only X chromosomes (she is XX), if a Y sperm fertilises the egg, your baby will be a boy (XY); if an X sperm fertilises the egg, your baby will be a girl (XX). With fertilization, the ovum becomes the zygote or embryo and now passes through complex phases of cell division and differentiation. You have just conceived! It's often thought that fertilization and conception are synonymous with pregnancy. However, at this stage, the zygote is free-floating in the womb. In the "free floating" phase prior to implantation, cell differentiation takes place. Here, some cells will become the fetus and



other cells, in a surrounding halo or constellation, will become the trophoblast, comprising the placenta, umbilical cord, and amniotic sac. For pregnancy to be successfully achieved, however, the embryo must implant in the endometrium (hence the importance of a thick, vascular-rich uterine lining). The start of pregnancy from the first day of your last menstrual period is called the "menstrual age."

**READING ASSIGNMENT:** Nigerian Basic Science Project Book Two page; 65-66

### GENERAL EVALUATION

1. What is the meaning of menstruation?
2. State five menstrual hygiene and cleanliness
3. Define ovulation
4. State five signs of ovulation

### WEEKEND ASSIGNMENT

1. After ovulation, the egg is swept into the fallopian tube and drifts along, brushed by waves of ----- e cilia toward the womb A. hairlike B. noselike C. thinlike D. all of the above
2. The ovum is covered by a protective field known as the----- A. zona pellucidal B. zona C. pellucidal D. none
3. The start of pregnancy from the first day of your last menstrual period is called the---- A. menstrual age B. menstrual thin C. menstrual stage D. menstruation.
4. After ovulation, during the luteal phase, the egg will be available to be fertilized by-- A. sperm B. ovum C. egg D. all of the above
5. ----- is the regular discharge of blood and mucosal tissue from the inner lining of the uterus through the vagina. A. Menstruation B. Menstrual stagnation C. Discharging D. Bleeding stage.

### THEORY

1. State five signs of ovulation
2. Mention four menstrual hygiene and cleanliness.

### WEEK FOUR

DATE:.....

#### TOPIC: HUMAN REPRODUCTION II

#### Pregnancy symptoms: Top 11 early signs of pregnancy

- Food aversions
- Mood swings
- Abdominal bloating
- Frequent urination
- Fatigue
- Sore breasts
- Light bleeding or spotting
- Nausea
- A missed period
- High basal body temperature



- Positive home pregnancy test

## GROWTH OF THE FOETUS

**One month pregnant;** Your baby is an embryo consisting of two layers of cells from which all her organs and body parts will develop.

**Two months pregnant;** Your baby is now about the size of a kidney bean and is constantly moving. He has distinct, slightly webbed fingers

**Three months pregnant;** By now your baby is around 7 to 8 centimeters (3 inches) long and weighs about the same as a pea pod. Her tiny, unique fingerprints are now in place.

**Four months pregnant;** Your baby is now about 13cm (5.5in) long and weighs 140g (5oz). His skeleton is starting to harden from rubbery cartilage to bone.

**Five months pregnant;** Eyebrows and eyelids are now in place. Your baby would now be more than 27cm (10.5in) long if you stretched out her legs.

**Six months pregnant;** Your baby weighs about a 660g (1.5lb). His wrinkled skin is starting to smooth out as he puts on baby fat.

**Seven months pregnant;** By now, your baby is more than 40cm (15in) long. She can open and close her eyes and probably see what's around her.

**Eight months pregnant;** Your baby now weighs about 2.2kg (4.7lb). His layers of fat are filling him out, making him rounder, and his lungs are well developed.

**Nine months pregnant;** Your baby is almost due. At birth, the average baby is more than 51cm (20.5in) long from head to toe and weighs approximately 3.4kg (7.5lb), but babies vary widely in size at this stage.

**READING ASSIGNMENT:** Nigerian Basic Science Project Book Two page; 65-66

## EVALUATION

1. State five signs of pregnancy
2. Explain the growth of the foetus.
3. Explain what happens when the pregnancy is five months old

## GENERAL EVALUATION

1. State five signs of pregnancy
2. Explain the growth of the foetus.
3. Explain what happens when the pregnancy is five months old
4. State five early signs of pregnancy.
5. Explain what happened at 8<sup>th</sup> month old pregnancy.

## WEEKEND ASSIGNMENT





1. One month pregnant; Your baby is an embryo consisting of -----layers of cells from which all her organs and body parts will develop. A. two B. three C. four D, five
2. Eight months pregnant; Your baby now weighs about -----kg (4.7lb). His layers of fat are filling him out, making him rounder, and his lungs are well developed. A. 2.2 B. 2.4 C. 2.7 D. 2.9
3. At----- months pregnant; Eyebrows and eyelids are now in place. A. five B. four C. two D. ten
4. Three months pregnant; By now your baby is around 7 to 8 centimeters (3 inches) long and weighs about the same as -----pod. A. a pea B. bean C. grain D. millet
5. Four months pregnant; Your baby is now about 13cm (5.5in) long and weighs 140g (5oz). His skeleton is starting to harden from----- cartilage to bone. A. rubbery B. plastic C. bony D. none of the above

## **THEORY**

1. State five early signs of pregnancy.
2. Explain what happened at 8<sup>th</sup> month old pregnancy.

## **WEEK FIVE**

**DATE:.....**

### **TOPIC: CONSEQUENCES/IMPLICATION OF TENAGE PREGNANCY**

Depression may arise when a teenager is pregnant. The teen may fall into a depression while trying to handle the emotions a pregnancy creates and all of the possibly negative feedback about the pregnancy from friends and family. The fluctuating hormones that a pregnancy causes may also prompt depression. Uncertainty about the future may arise when a teen is pregnant. A teen may feel she does not have enough knowledge to be a mother. She may also have fears about how having a baby will impact her own life and dreams for the future. A teenager may suffer an emotional crisis if she becomes pregnant and does not want the baby. This crisis may lead to rash behavior such as attempting to self-abort the baby or a suicide attempt.

### **Consequences of Teen Pregnancy**

- Keeping the baby
- Putting the baby up for adoption
- Aborting the fetus

The main reasons given for abortion are as follows;

- Concern over how the baby would change life
- Level of maturity concerns
- Financial concerns
- Emotional Crisis
- Worries about Future
- Delayed Education
- Smoking & Drugs
- Exhaustion
- Depression
- Neglect of Baby



- Trouble with Finances

## EVALUATION

1. State three causes of teenage pregnancy
2. State five reasons for abortion

### Effect of drugs and self medications during pregnancy

If you're pregnant or thinking about getting pregnant and want a healthy baby, then it's very important to avoid drug use during pregnancy. Illegal drugs such as marijuana, cocaine, and methamphetamine aren't the only drugs that are harmful to fetal development; Commonly used over-the-counter medicines, along with substances such as caffeine and alcohol, can have lasting effects on an unborn child. It's possible that you may not have a serious or long-lasting problem after using drugs. But the same is not always true for a fetus. Drug-using mothers often give birth to "drug babies." These children have a host of developmental problems.

### EFFECT OF DRUG ABUSE ON PREGNANCY

The effects of substance abuse during pregnancy may be classified into three categories: effects on the mother, effects on the course of pregnancy and delivery, and effects on the fetus, newborn, and developing child. Fetal complications associated with maternal substance abuse include placenta previa, abruptio placentae, premature rupture of membranes, spontaneous abortion, intrauterine growth retardation, premature delivery, birth defects, and neonatal and long-term developmental effects.

### CAUSES AND CONSEQUENCE OF BIRTH DEFECT

Birth Defect Causes 1: May Include Alcohol and Cigarettes

Birth defect causes vary, from alcohol to cigarettes to pharmaceutical medicines to illegal drugs, all of which can affect how a baby develops in the womb during pregnancy. Scientific studies have shown that exposure to dangerous chemicals, particularly during the first trimester, can significantly alter normal development and result in abnormal deformities in the heart, limbs, lungs, brain, and more. Following are a few more details on four of the major birth defect causes.

Birth Defect Cause 2: Prescription Medications

A child that is exposed to the chemicals in prescribed drugs may have a greater chance of being born with medicine birth defects. Depending on the situation, the medicine birth defects may range from mild to severe, and sometimes may require lifelong medical treatment. Potential medicine birth defects include:

- Cleft lip
- Cleft palate
- Limb deformities
- Congenital heart defects
- Spina bifida
- Neural tube birth defects

**Birth Defect Cause 3: Illicit Drugs**



Illegal street drugs including marijuana, methamphetamines, cocaine, and heroine are just a few substances that can lead to street drug birth defects. While in the womb, the fetus shares blood and nutrients with the mother, and so may be exposed to ingested drugs when the substances enter the placenta.

Some of the potential street drugs birth defects include the following:

- Reduced oxygen supply to the baby
- Restricted growth
- Small head size
- Drug dependency at birth
- Difficulty feeding
- Drug withdrawal symptoms
- Muscle spasms
- Tremors
- Brain damage
- Lack of muscle control
- Learning disabilities

#### **Birth Defect Cause 4: Alcohol**

If alcohol is consumed during pregnancy, the fetus may develop adverse health conditions, typically referred to as fetal alcohol spectrum disorder (FASDs). Of the FASDs, the most threatening to an unborn child is fetal alcohol syndrome (FAS) – the effects of which can cause mental and physical harm.

The exposure of a child to alcohol during fetal development can also lead to other health complications including the following:

- Birth defects potentially affecting the heart, brain and other organs
- Vision or hearing problems
- Premature birth
- Underweight at birth
- Learning disabilities (including mental retardation)
- Sleeping and sucking problems
- Speech and language delays
- Behavioral problems

#### **EVALUATION**

1. What are the effects of alcohol in pregnancy?
2. Mention causes and consequences of birth defect.

#### **MYTHS AND FACTS ABOUT TENAGE PREGNANCY**

Pregnancy: Myths and Facts

**Myth: I can't get pregnant if I have my period.**

**Fact:** You can get pregnant if you have vaginal sex while you have your period. Sperm can survive inside of you anywhere from a day to almost a week, which means that the sperm could still be waiting for an egg to fertilize when you ovulate. If you decide to have sex while you have your period, you should still use birth control



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And you should always use a condom since it is the only effective protection we have against sexually transmitted infections (STI's). STI's don't care if you have your period or not, they can be passed on to you at anytime so it's best to protect yourself every time you have sex. If you think you may be pregnant, take a home pregnancy test right away. Ultra sensitive home pregnancy tests can give you results as quickly as six to eight days after conception.

**Myth: I can't get pregnant if he doesn't ejaculate inside of me.**

Fact: You can get pregnant if your partner ejaculates inside your vagina or on or near your vulva (this is your external genitals including the opening to your vagina). There is also something called pre-ejaculate which is a small amount of fluid that contains thousands of sperm. It is called pre-ejaculate because your partner releases it before he actually ejaculates. Because of pre-ejaculate, the withdrawal method (when your partner pulls out before he climaxes) is not a reliable birth control method.

**Myth: I can't get pregnant if he doesn't put his penis inside of me.**

Fact: Pregnancy can occur when your partner ejaculates or pre-ejaculates near or on your vulva. Even if you and your partner do not engage in vaginal sex, there is still a chance of getting pregnant if there is naked body contact. So use birth control, like a condom, which will also help to protect you from STI's.

**Myth: I can't get pregnant the first time I have sex.**

Fact: You can get pregnant any and every time you have sex, it doesn't matter if it is your first time or not. Plus, females are the most fertile when they are teenagers and in their early 20's, so always use a reliable form of birth control.

## FINDING HELP

As the incidence of substance use among women of reproductive age continues to increase, substance abuse during pregnancy is a growing health issue because it affects the future generations of our country. Because substance abuse during pregnancy is often difficult to detect,

- the physician should include a detailed substance abuse history in every new patient encounter, with follow-up questions performed during subsequent visits.
- Once detected, substance abuse during pregnancy confronts the physician with issues regarding management, treatment, and potential maternal, fetal, and pregnancy-related complications, yet also provides the physician with a unique opportunity for intervention at a time when the woman may be most amenable to change.
- Many management and treatment options exist with the ultimate goal of abstinence and should be designed to meet the needs and address the concerns of the individual.
- By increasing the awareness of substance abuse during pregnancy among the medical community, physicians may better recognize and address this problem, thus improving the overall health of this population.

**READING ASSIGNMENT:** Nigerian Basic Science Project Book Two page: 3-4



### GENERAL EVALUATION

1. State three causes of teenage pregnancy
2. State five reasons for abortion
3. What are the effects of alcohol in pregnancy
4. Mention the causes and consequences of birth defect
5. State five health defects of drugs during pregnancy.

### WEEKEND ASSIGNMENT

1. ----- may arise when a teenager is pregnant. A. Depression B. Joy C. Education D. complications
2. The fluctuating ----- that a pregnancy causes may also prompt depression. A. hormones B. cell C. organ D. chromosomes
3. The effects of substance abuse during pregnancy may be classified into ----- categories A. three B. two C. four D. five
4. A child that is exposed to the chemicals in prescribed drugs may have a greater chance of being born with medicine ----- defects. A. birth B. coming C. discharging D. procreation.
5. If alcohol is consumed during pregnancy, the fetus may develop adverse health conditions, typically referred to as ----- alcohol spectrum disorder (FASDs). A. fetal B. chemicals C. medicine D. embryonic

### THEORY

1. State five health complications exposing a child to alcohol during fetal development can also lead to .
2. State five health defects of drugs during pregnancy.

### WEEK SIX

DATE .....

#### SEXUALLY TRANSMITTED INFECTIONS ( STIs)

Sexually Transmitted Infections (STIs), also known as Sexually Transmitted Diseases (STDs) or Venereal Diseases (VD) are diseases that are passed on from one person to another through sexual contact, and sometimes by genital contact - the infection can be passed on via vaginal intercourse, oral sex, and anal sex.

#### Modes of transmission

- use of unsterilized IV drug needles,
- from mother to baby during childbirth or breastfeeding, and
- blood transfusions.
- When using unsterilized skin piercing instruments, e.g. needles, syringe razor blades, circumcision and other skin piercing instruments.

#### EFFECTS OF SEXUALLY TRANSMITTED DISEASES

The effects of STIs are: Chlamydia, Chancroid, Crabs (Pubic Lice), Genital herpes, Genital warts, Hepatitis B, HIV/AIDS, Human Papillomavirus (HPV), Trichomoniasis (parasitic



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infection), Molluscum Contagiosum, Pelvic Inflammatory Disease (PID), Scabies, Syphilis, gonorrhea, Trichomoniasis (Trich), Yeast infections

## Evaluation

1. What are STIs?
2. Mention four ways by which STIs can be transmitted.

## PREVENTIVE MEASURE

Have "safe sex" - for each sexual act, use a new latex condom, whether it be oral, vaginal or anal sex. Avoid using an oil-based lubricant, such as petroleum jelly when using a latex condom. Non-barrier forms of contraception do nothing to protect people from sexually transmitted infections. Examples include oral contraceptives or intrauterine devices.

- Using a condom is one of the best methods of STI prevention.
- Abstain - abstaining from any sexual act is probably the most effective way to avoid becoming infected with an STI.
- Be faithful to one uninfected partner - be in a long-term relationship with a person who is not infected, and remain faithful.
- Vaccinations - there are vaccinations which can protect from eventually developing some types of cancer caused by two STIs - the HPV (human papilloma virus) and Hepatitis B vaccines.
- Check for infections - before sexual intercourse with a new partner, check that the partner and yourself have no STIs.
- Drink alcohol in moderation - people who are drunk are more likely to engage in risky behavior. Avoid using some recreational drugs which may also affect judgment.
- Explain you want safe sex - before engaging in any sexual act with a new partner, make it clear that you would only consider safe sex.
- Education - parents and schools need to teach children about the importance of safe sex, and explain how to prevent becoming infected with an STI. This should also include explaining that the safest protection is to wait to have sex.

## EVALUATION

1. Mention five ways by which STIs can be controlled
2. Explain education as a means of controlling STIs

**READING ASSIGNMENT;** Precious seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK 1 PAGE 96-108

## WEEKEND ASSIGNMENT

1. One of the ways to avoid STI is -----  
A. Abstain from sex B. Human immunodeficiency virus C. Human immunodeficiency virus D. keeping to sex.
2. Sexually Transmitted Diseases (STDs) is also known as -----  
A. Venereal Diseases B. plasmodium C. kissing D. Human immunodeficiency virus
3. STI means -----  
A. Sexually Transmitted Infections B. acquired immune deficiency sickness C. acquired immune deficiency system D. none



4. STIs can be transmitted through the following ways except  
A. during kissing B. during sexual intercourse C. sweat D. none
5. Which of the following body fluids does not transmit STIs?  
A. semen B. sweat C. maternal milk D. during sexual intercourse

## THEORY

1. Mention three ways of preventing STIs.
2. Mention four ways through which STIs can be transmitted

## WEEK SEVEN

DATE .....

### TOPIC: HIV / AIDS I

#### CONTENT

Definition of STIS / HIV / AIDS

- Preventive measure
- Safe age for reproduction
- Abstinence
- Responsible sexual behaviour
- Avoid use of unscreened blood, unsterilized needle, syringe and clipper

#### DEFINITION OF STI /HIV/AIDS

STIs means sexually transmitted infections.

1. HIV stand for Human Immunodeficiency Virus while AIDS stands for Acquired Immune Deficiency Syndrome.
2. HIV is the virus that causes AIDS.
3. HIV destroys the body defence system while AIDS is the name given to the condition that occurs when HIV has weakened the body's immune system.

#### EVALUATION

1. State the full meaning of HIV and AIDS.
2. State the symptoms of AIDS.
3. State the difference between HIV and AIDS.

#### HOW HIV / AIDS CAN BE TRANSMITTED

HIV is found in the body fluids (blood, semen, pre-ejaculatory fluids and matured maternal milk). HIV can be transmitted when the fluid body fluid of an infected person enters the body of another person. This can happen through the following ways:

1. during sexual intercourse
2. during blood transfusion
3. When using unsterilized skin piercing instruments, e.g. needles, syringe razor blades, circumcision and other skin piercing instruments.
4. From an infected mother to her baby through breast feeding.

#### COUNSELLING AND TESTING FOR HIV



People living with HIV and AIDS need proper information, counselling, care and support. They should be advised to:

1. Protect themselves against any form of sexually transmitted infections
2. Avoid passing the infection to other through unprotected sexual intercourse
3. Share information about their HIV status with their spouses and those they trust.
4. Eat nourishing food and take plenty of rest
5. Seek counselling about pregnancy for the health of both the mother and child.

### HOW TO PREVENT HIV/ AIDS

There is no vaccine to prevent HIV infection but scientists are working very hard to develop one. However, some of these behaviours can be adopted to prevent the infection.

1. Practise safe sex.
2. Stick to one faithful unaffected partner.
3. Abstain from sex .
4. Ensure you transfuse or receive only screened blood.
5. Infected mothers should seek advice during pregnancy on choice of drug therapy and consideration of breast feeding and delivery options

### SAFE AGE FOR REPRODUCTION

The preventive measure mentioned above save teenagers from early marriage

### Evaluation

1. How can HIV positive be advised?
2. Mention four preventive measure against HIV

**READING ASSIGNMENT:** NIGERIA BASIC SCIENCE PROJECT PAGE 51-56, Basic Science by NNOF pages 43-47

### EVALUATION

1. Mention four fluids through which HIV / AIDS can be transmitted.
2. Mention four ways through which HIV / AIDS can be transmitted.
3. Mention four counselling that can be given to an HIV / AIDS patient.

### General Evaluation

1. State the full meaning of HIV and AIDS.
2. State the symptoms of AIDS.
3. State the difference between HIV and AIDS
4. How can HIV positive be advised?
5. Mention four preventive measures against HIV

**READING ASSIGNMENT:** Precious seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK 1 PAGE 96.

### WEEKEND ASSIGNMENT

1. What is the meaning of HIV?  
A. Human immunodisease virus B. Human immno destroying virus C. Human immunodeficiency virus D. all





2. The virus that causes AIDS is -----  
A. HIV B. plasmodium C. kissing D. all
3. AIDS means -----  
A. acquired immune deficiency syndrome B. acquired immune deficiency sickness C. acquired immune deficiency system D. none
4. HIV / AIDS can be transmitted through the following ways except A. during kissing  
B. during sexual intercourse C. using sterilized object D. none
5. Which of the following body fluids does not transmit HIV? A. semen B. sweat  
C. maternal milk none.

## THEORY

1. Mention three symptoms of AIDS
2. Mention four ways through which HIV can be transmitted

## WEEK EIGHT

DATE .....

### TOPIC: HIV/AIDS (II)

#### COUNSELLING AND TESTING

**VCT** stands for voluntary counseling and testing. **VCT** is when a person chooses to undergo HIV/AIDS counseling so that they can make an informed decision about whether to be tested for HIV. The government is encouraging all of us to come forward to be tested for HIV. It believes that if many of us get tested, even though we may not be sick, this will help to lessen the amount of stigma associated with the HIV test. Also, if we find out at an earlier stage, that we are infected with HIV, we can

- Learn more about the virus and how it affects our body.
- Look after our health so that we stay as healthy as possible for as long as possible.
- Get information and counseling around how to live positively with the virus. This means learning to accept the fact that we are HIV-infected, seeking emotional support, eating a healthy diet, learning how to control the amount of stress in our life, making sure we don't become re-infected, and planning for the future.
- Learn to recognize the signs of opportunistic infections so we can get them treated promptly.
- Find out what resources are available within our community to help us manage our HIV status.
- Find out about **prophylactic** drugs. These drugs do not cure HIV/AIDS, but can prevent us from getting some opportunistic infections that are common with people living with HIV/AIDS eg. T.B and some kinds of Pneumonia
- Access **Nevirapne**. This is a drug available at a number of hospitals and clinics that lessens the chance of a pregnant mother passing the virus onto her baby.
- Get emotional support by seeking counseling and joining support groups.
- Make sure that we don't infect anyone else or get re-infected ourselves
- Learn how to manage the stress in our lives
- If we are not infected with HIV, VCT can motivate us to stay HIV antibody negative, and to accept those who are infected.

## Opportunistic Infections



These are the kind of infections that your body would normally be able to control if your immune system was strong. Unfortunately, when HIV destroys your immune system, these diseases flourish. They are called **opportunistic** because if your immune system was strong, they would not be able to flourish. Some examples are thrush of the mouth and TB.

### **Counseling can empower you!**

Counseling is a private conversation with a specially trained person aimed at helping you to help yourself. Counseling encourages you to explore possible solutions to your problems, and to consider the impact that certain decision may have on your life. HIV/AIDS counseling provided at VCT sites is free and confidential. This means that the Counselor cannot tell anyone about your result without your permission. You must receive face-to-face counseling before you have the test. This is known as pre-test counseling, and is aimed at ensuring that you make a well-informed decision about whether to have the HIV test or not, and encourages you to explore the possible impact that having the test may have on your life. Once the test has been done, you will receive post-test counseling. This is the counseling during which you will receive your result. The counseling that you may have once you already know your result is known as on-going counseling.

### **Evaluation**

1. What is the full meaning of VCT?
2. What is the meaning of VCT?

### **CARE AND SUPPORT**

1. Spend time with the person living with HIV/AIDS. Discuss the foods they need to maintain and gain weight and manage their illness. Get to know what kind of foods they like and do not like. Involve them in planning their meals.
2. Keep an eye on their weight. If possible, weigh them regularly and keep a record. Look out for any unexpected weight loss and take action.
3. Check the medicines they are taking. Read the instructions to find out when they need to be taken, what foods to be avoided and any side-effects.
4. Be encouraging and loving. If people want to have food of their choice at any time of the day, try to get it for them. They may suddenly stop liking a food, refuse what has been prepared and want something different. They are not trying to be difficult. These sudden changes in taste are a result of their illness.
5. Be firm about the importance of eating and encourage them to eat frequently, but do not force them to eat. Giving them too much food at one time may cause them to refuse.
6. If they are too sick to leave their beds, make sure that they have something to drink and a snack nearby.
7. Keep a watchful eye. Look around to see if the house is clean, that there are no hygiene problems and there is enough food.
8. If the sick person lives alone, invite them to join your family for a meal. Encourage others in the community to visit them and invite them out.
9. Carers will have their own concerns and worries, fears for the future, for their families and for their own health. It is important that they take care of themselves,



get enough rest and have the appropriate information and support to carry out their difficult task. The important messages given below cannot be emphasized enough.

HIV/AIDS is not spread by food or water.

HIV/AIDS cannot be spread by sharing food, dishes or cooking utensils such as cups, plates, knives and forks with a person who is HIV positive.

HIV/AIDS cannot be spread by touching another person, hugging, shaking hands or holding other people in a normal way. There is no need to avoid body contact with a person living with HIV/AIDS.

### Evaluation

1. State five care and support for HIV/AIDS
2. Mention five ways by which HIV/AIDS are not transmitted.

### MYTHS AND FACTS ABOUT HIV/AIDS

One person passes HIV to another under certain circumstances. Understanding the facts rather than buying into lingering myths about transmission can prevent misinformation — and HIV — from spreading.

#### 1. Transmission through body fluids

HIV is transmitted through certain body fluids that are capable of containing high concentrations of HIV antibodies. These fluids include blood, semen, vaginal and rectal secretions, and breast milk.

- HIV is transmitted when fluids from an infected person (HIV positive) pass through the mucous membranes, cuts, or open sores of a noninfected person (HIV negative).
- Amniotic and spinal cord fluids can also contain the HIV virus and may be a risk to healthcare personnel who are exposed to them. Other bodily fluids, such as tears and saliva, cannot spread the infection unless they are mixed with fluids that can.

#### 2. The anatomy of transmission

- Vaginal sex is one mode of HIV transmission. There have been reported cases of HIV transmission via oral sex. However, anal sex presents the highest risk of transmission among sexual activity. Bleeding is more likely during anal sex due to the fragile tissues that line the anus. This allows the virus to enter the body more easily.
- HIV can also be spread from mother to child in utero and through breastfeeding. Any circumstances in which you are exposed to the blood of someone who is HIV positive can be a risk factor. This includes sharing needles for intravenous drug use or getting a tattoo with contaminated instruments. Safety regulations generally prevent blood transfusion-related infection.

#### 3. Blood banks are safe

The risk of being infected with HIV from a blood transfusion is now extremely rare in the United States. The Public Health Service started testing all donated blood for HIV in 1985, after medical personnel realized that donated blood could be a source of HIV infection. Tests that are more sophisticated were put into place in the 1990s to further ensure the safety of donated blood. Blood donations that test positive for HIV are safely discarded and do not enter the U.S. blood supply.



#### 4. Casual contact and kissing

Many people are afraid that casual contact or kissing someone who has HIV can spread the infection. The virus doesn't live on the skin and can't live very long outside the body. Therefore, casual contact, such as holding hands, hugging, or sitting next to someone who is HIV positive, doesn't transmit the virus. Closed-mouth kissing isn't a threat either. Open-mouthed kissing can be a risk factor when blood is involved, such as from bleeding gums or mouth sores. Saliva may contain small amounts of viral load, but not enough to transmit the virus.

#### 5. Biting, scratching, and spitting

Scratching and spitting aren't transmission methods for HIV. A scratch doesn't lead to an exchange of bodily fluids. However, you can protect yourself with gloves to prevent the accidental exposure to infected blood when drawing blood from someone who is infected with HIV.

A bite that doesn't break the skin can't transmit infection either. However, a bite that opens the skin and causes bleeding can.

#### General Evaluation

1. Mention five myths and facts about HIV/AIDS
2. State five care and support for HIV/AIDS.
3. Mention five ways by which HIV/AIDS are not transmitted?
4. What is the full meaning of VCT?
5. What is the meaning of VCT?

**READING ASSIGNMENT;** Precious seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK 1 PAGE 96

#### WEEKEND ASSIGNMENT

1. VCT stands for----- A. voluntary counseling and testing B. vision complain test C. ventilated capacitated test D. Vent cum tone.
2. -----sex presents the highest risk of transmission among sexual activity. A. Anal B. Oral C. Canal D. Sucking.
3. -----is a private conversation with a specially trained person aimed at helping you to help yourself. A. Counseling B. Testing C. Observing D. Patient orientation
4. -----are the kind of infections that your body would normally be able to control if your immune system was strong. A. Opportunistic Infections B. HIV/AIDS C. Influenza D. None
5. ----- is a drug available at a number of hospitals and clinics that lessens the chance of a pregnant mother passing the virus onto her baby. A. Nevirapne. B. Nevadan C. Neiva D. Nevira

#### THEORY

1. Mention five ways by which HIV/AIDS are not transmitted.
2. What is the full meaning of VCT?



## WEEK NINE

DATE .....

### TOPIC: ENERGY

Energy is the amount of force or power when applied can move one object from one position to another or Energy defines the capacity of a system to do work. Energy exists in everybody whether they are human beings or animals or non living things for e.g.: Jet, Light, Machines etc.

### SOURCES OF ENERGY

1. **Solar Energy:** Solar power harvests the energy of the sun through using collector panels to create conditions that can then be turned into a kind of power. Large solar panel fields are often used in desert to gather enough power to charge small substations, and many homes use solar systems to provide for hot water, cooling and supplement their electricity. The issue with solar is that while there is plentiful amounts of sun available, only certain geographical ranges of the world get enough of the direct power of the sun for long enough to generate usable power from this source.

2. **Wind Energy:** Wind power is becoming more and more common. The new innovations that are allowing wind farms to appear are making them a more common sight. By using large turbines to take available wind as the power to turn, the turbine can then turn a generator to produce electricity. While this seemed like an ideal solution to many, the reality of the wind farms is starting to reveal an unforeseen ecological impact that may not make it an ideal choice.

3. **Geothermal Energy:** Geothermal energy is the energy that is produced from beneath the earth. It is clean, sustainable and environment friendly. High temperatures are produced continuously inside the earth's crust by the slow decay of radioactive particles. Hot rocks present below the earth heats up the water that produces steam. The steam is then captured that helps to move turbines. The rotating turbines then power the generators. Geothermal energy can be used by a residential unit or on a large scale by a industrial application. It was used during ancient times for bathing and space heating. The biggest disadvantage with geothermal energy is that it can only be produced at selected sites throughout the world. The largest group of geothermal power plants in the world is located at The Geysers, a geothermal field in California, United States.

4. **Hydrogen Energy:** Hydrogen is available with water ( $H_2O$ ) and is most common element available on earth. Water contains two-thirds of hydrogen and can be found in combination with other elements. Once it is separated, it can be used as a fuel for generating electricity. Hydrogen is a tremendous source of energy and can be used as a source of fuel to power ships, vehicles, homes, industries and rockets. It is completely renewable, can be produced on demand and does not leave any toxic emissions in the atmosphere.

5. **Tidal Energy:** Tidal energy uses rise and fall of tides to convert kinetic energy of incoming and outgoing tides into electrical energy. The generation of energy through tidal power is mostly prevalent in coastal areas. Huge investment and limited availability of sites are few of the drawbacks of tidal energy. When there is increased height of water levels in the



ocean, tides are produced which rush back and forth in the ocean. Tidal energy is one of the renewable source of energy and produce large energy even when the tides are at low speed.

6. **Wave Energy:** Wave energy is produced from the waves that are produced in the oceans. Wave energy is renewable, environment friendly and causes no harm to atmosphere. It can be harnessed along coastal regions of many countries and can help a country to reduce its dependence on foreign countries for fuel. Producing wave energy can damage marine ecosystem and can also be a source of disturbance to private and commercial vessels. It is highly dependent on wavelength and can also be a source of visual and noise pollution.

7. **Hydroelectric Energy:** What many people are not aware of is that most of the cities and towns in the world rely on hydropower, and have for the past century. Every time you see a major damn, it is providing hydropower to an electrical station somewhere. The power of the water is used to turn generators to produce the electricity that is then used. The problems faced with hydropower right now have to do with the aging of the dams. Many of them need major restoration work to remain functional and safe, and that costs enormous sums of money. The drain on the world's drinkable water supply is also causing issues as townships may wind up needing to consume the water that provides them power too.

8. **Biomass Energy:** Biomass energy is produced from organic material and is commonly used throughout the world. Chlorophyll present in plants captures the sun's energy by converting carbon dioxide from the air and water from the ground into carbohydrates through the process of photosynthesis. When the plants are burned, the water and carbon dioxide is again released back into the atmosphere. Biomass energy is used for heating and cooking in homes and as a fuel in industrial production.

9. **Nuclear Power:** While nuclear power remains a great subject of debate as to how safe it is to use, and whether or not it is really energy efficient when you take into account the waste it produces – the fact is it remains one of the major renewable sources of energy available to the world. The energy is created through a specific nuclear reaction, which is then collected and used to power generators.

10. **Fossil Fuels (Coal, Oil and Natural Gas);** Fossil fuels provide the power for most of the world, primarily using coal and oil. Oil is converted into many products, the most used of which is gasoline. Natural gas is starting to become more common, but is used mostly for heating applications. Although, there are more and more natural gas powered vehicles appearing on the streets.. The fossil fuel reserves are also limited, expecting to last only another 100 years given are basic rate of consumption.

### Evaluation

1. What is energy?
2. State five sources of energy?

### Different Forms of Energy



Energy exists in many different forms. Examples of these are: light energy, heat energy, mechanical energy, gravitational energy, electrical energy, sound energy, chemical energy, nuclear or atomic energy and so on. These forms of energy can be transferred and transformed between one another. This is of immense benefit to us. For a source of energy to end up as electricity it may undergo many transformations before it can power the light bulb in your home.

Although there are many specific types of energy, the two major forms are Kinetic Energy and Potential Energy.

**Kinetic energy** is the energy in moving objects or mass. Wind energy is an example. The molecules of gas within the air, are moving giving them kinetic energy.

**Potential energy** is any form of energy that has stored potential that can be put to future use. For example, water stored in a dam for hydroelectricity generation is a form of potential energy. When valves are opened the force of gravity cause water to begin to flow. The gravitational potential energy of the water is converting to kinetic energy. The flowing water can turn a turbine, which will further convert the kinetic energy of the water into useable mechanical energy. An alternator or generator then converts the mechanical energy from the turbine into electrical energy. This electricity is then sent to the electricity grid and to our homes where it is converted into light energy (lights and televisions), sound energy (televisions, stereos), heat energy (hot water, toasters, ovens), mechanical energy (fans, vacuum cleaners, fridge and air conditioner compressors) and so on.

## ENERGY CONVERSION

We meet energy conversions many times every day of our lives. The following are types of energy conversion and their converters or converting devices.

ENERGY CONVERSION	ENERGY CONVERTER
Chemical to heat energy	Match, rockets
Electrical to sound energy	Electric Bell, loudspeaker
Chemical to Electrical	Dry Cells (Batteries)
Light to chemical energy	Green plant leaves
Mechanical to mechanical	Brakes of a car/bike
Chemical to mechanical	Human body /car
Mechanical to sound energy	Drum/hand bell
Chemical to sound energy	Firework (Banger)
Sound to Electrical energy	Microphone

## EVALUATION

1. State the law of conservation of energy.
2. List five forms of energy
3. List five examples of energy conversions and their converters in each case.

## General Evaluation

1. State the law of conservation of energy.
2. List five forms of energy



3. List five examples of energy conversions and their converters in each case.
4. What is energy?
5. What are five sources of energy?

**READING ASSIGNMENT;** Precious seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK 1 PAGE 134-145

### WEEKEND ASSIGNMENT

1. The mainspring to all life activities is the A. energy B. power C. work D. force
2. The device which can convert solar energy to electricity is the A. electro magnet B. photo voltaic solar panel C. turbine D. dynamic
3. The chlorophyll in plants use ----- to produce energy. A. light B. plant C. sun D. atmosphere.
4. The energy directly from the sun is converted using ----- A. voltaic solar panel B. generator C. photogenic machine D. none
5. The law of conservation of energy is also known as ----- A. First law of thermodynamic B. law of mass action C. Pythagoras theorem D. Indosian theory.

### Theory

1. State the law of conservation of energy
2. List five energy conversion and their converters

### WEEK NINE

DATE .....

#### TOPIC: RENEWABLE ENERGY

Energy is the amount of force or power when applied can move one object from one position to another or Energy defines the capacity of a system to do work. Energy exists in everybody whether they are human beings or animals or non living things for e.g.: Jet, Light, Machines etc.

#### What are the Sources of Energy?

Energy is broadly classified into two main groups: Renewable and Non-renewable.

#### Renewable Energy

Renewable energy is the energy which is generated from natural sources i.e. sun, wind, rain, tides and can be generated again and again as and when required. They are available in plenty and by far the most cleanest sources of energy available on this planet. E.g. energy that we receive from the sun can be used to generate electricity. Similarly, energy from wind, geothermal, biomass from plants, tides can be used to fulfill our daily energy demands.

Here are some of the pros and cons of using renewable sources of energy.

#### Evaluation

1. What is energy?
2. State two ways by which energy is classified

#### Pros





The sun, wind, geothermal, ocean energy are available in the abundant quantity and free to use.

The non-renewable sources of energy that we are using are limited and are bound to expire one day.

Renewable sources have low carbon emissions, therefore they are considered as green and environment friendly.

- Renewable helps in stimulating the economy and creating job opportunities. The money that is used to build these plants can provide jobs to thousands and millions of people.
- You don't have to rely on any third country for the supply of renewable sources as in case of non-renewable sources.
- Renewable sources can cost less than consuming the local electrical supply. In the long run, the prices of electricity are expected to soar since they are based on the prices of crude oil, so renewable sources can cut your electricity bills.
- Various tax incentives in the form of tax waivers, credit deductions are available for individuals and businesses who want to go green.

### Cons

- It is not easy to set up a plant as the initial costs are quite steep.
- Solar energy can be used during the day time and not during night or rainy season.
- Geothermal energy which can be used to generate electricity has side effects too. It can bring toxic chemicals beneath the earth surface onto the top and can create environmental changes.
- Hydroelectric provide pure form of energy but building dams across the river which is quite expensive can affect natural flow and affect wildlife.
- To use wind energy, you have to rely on strong winds therefore you have to choose suitable site to operate them. Also, they can affect bird population as they are quite high.

### EVALUATION

1. State the meaning of renewable and non-renewable energy
2. Give two examples each of renewable and non-renewable energy.
3. State two each of pros and cons of energy.

### Non-Renewable Energy

Non-Renewable energy is the energy which is taken from the sources that are available on the earth in limited quantity and will vanish fifty-sixty years from now. Non-renewable sources are not environmental friendly and can have serious affect on our health. They are called non-renewable because they cannot be re-generated within a short span of time. Non-renewable sources exist in the form of fossil fuels, natural gas, oil and coal

### EVALUATION

1. Give two uses and misuses of energy
2. What is the implication of misuse of petroleum

### ENERGY AND SOCIETY



Economic security is impacted by energy choices. Individuals and society continually make energy choices that have economic consequences.

- Transportation can have negative consequences to the health, environment and economics of a society.
- Relying on imported energy can create vulnerabilities to a nation's security. The impacts of energy decisions are not equal for all people.
- Poor or marginalized societies are more likely to suffer negative consequences of energy decisions because they have a reduced capacity for adaptation and they may lack negotiating power compared to wealthy nations. However, vulnerable populations can also benefit greatly from improvements in energy accessibility, safety or affordability.
- The world is strongly dependent on energy from finite supplies of fossil fuels. As demand increases and supply becomes scarce, the problem becomes more acute, with potentially severe economic and social consequences. A large-scale transition away from fossil energy poses a great challenge for society.

These consequences come in the form of monetary cost in general and in the form of price fluctuation and instability specifically.

- People will be hungry, starvation will set in due to poor transportation in the country
- Travelling, especially to overseas countries. It will not be easy because of lack of aviation fuel
- Transportation of goods and services will be very hard for lack of petrol and diesel. Solar energy can be used during the day time and not during night or rainy season.

Energy generation has affected the quality of life in many ways:

1. Many self-employed depend on electricity for their works e.g. hairdressers, tailors, welders.
2. The cost of production is increased in some companies when electricity supply is poor.
3. Without electricity, radio and television may not be operated in some home and people become uninformed.
4. Without electricity the refrigerator will not work, and it will be difficult to preserve food

### EVALUATION

1. Mention four ways how energy generation affect quality of life
2. Give two ways how electrical energy has affected quality of life.

### WEEKEND ASSIGNMENT

1. ----- is the energy that is restorable A. renewable energy B. kerosene C. petrol D. wood
2. Hydroelectric provide pure form of energy but building dams across the river which is quite expensive can affect ----- and affect wildlife. A. natural flow B. artificial flow C. in and out flow D. none of the above
3. Renewable energy is one that
4. Using a set of generator instead of electricity will -----



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- A. increases the cost of production of some industries B. help to use petrol adequately C. result to closing of industries D. increase the quality of life in the society
5. Without electricity there will be spoilage of the following food except -----  
A. fish B. meat C. garri D. meat

## THEORY

1. Describe the effects of energy generation on quality of society
2. Give three examples each of renewable and non-renewable energy
3. Explain the implications of unwise use of non-renewable energy

**READING ASSIGNMENT;** Precious seed BASIC SCIENCE FOR JUNIOR SECONDARY SCHOOLS BOOK 1 PAGE 146-151, NIGERIA BASIC SCIENCE PROJECT PAGE 77-83.