SUBJECT:

**BASIC SCIENCE & TECHNOLOGY {BST} – BASIC SCIENCE**

CLASS:

**JUIOR SECONDARY SCHOOL 1**

TERM**:**

**THIRD**

**SCHEME OF WORK**

**WEEK TOPIC**

1. Revision of last term work; Human reproduction (I) - Menstruation, ovulation, fertilization
2. Human reproduction (II) – Pregnancy (conception) - signs and symptoms of pregnancy; stages of growth of the fetus
3. Force - meaning and types, contact and non-contact force, magnetic and gravitational force
4. Calculation of gravitational force; Balanced and unbalanced forces; Friction – meaning, uses, advantages and disadvantages
5. Space travel – meaning, purpose, benefits and dangers of space travel

***Mid-term project***

1. Gravitation and weightlessness – meaning and effect
2. Earth and space - solar system, rotation and revolution, eclipse and season
3. Earth and space - solar system, rotation and revolution, eclipse and season
4. Satellite - meaning and uses
5. Consequences and implications of teenage pregnancy – physical, social and emotional implication, Effects of drugs, self-medication and drug abuse during pregnancy, causes and consequences of birth defects
6. Revision
7. Examination

**WEEK ONE**

**HUMAN REPRODUCTION (I)**

* **Menstruation**
* **Ovulation**
* **Fertilization**

**Menstruation**

Menstruation is the monthly flow or discharge of blood from the vagina of a woman at child bearing age. It is also called period. The first occurrence of menstruation is called menarche.

The first period usually begins between twelve and fifteen years of age. The periods, however 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 on the average of 28days. Menstruation stops occurring at menopause, which usually occurs between 45 and 55 years of age.

This flow of blood usually lasts between 2 to 7 days but on the average it is 5days

During pregnancy and for some time after childbirth, menstruation does not occur; this state is known as ***amenorrhea***.

Menstrual disorders and problems associated with menstruation

1. *Heavy period*: This is when there is an unusual and excessive flow of blood. It can also cause an extension of the bleeding to seven days.
2. *The absence of menstrual periods*: This condition involves an absence of menstruation for 3 months or longer in a sexually mature woman who is not pregnant or breastfeeding.
3. *Pain and discomfort*: Just before and/ or during menstruation there can be that is severe enough to interfere with normal daily activities. Such pain is usually experienced in the abdominal region and lower back as well as abdominal bloating, breast tenderness, headache, sleep problem and mood swings.
4. *Bleeding between menstrual periods*: (Such as abnormal uterine bleeding, spotting) can be the symptom of another medicalcondition, which can vary from minor to serious. Women who experience abnormal uterine bleeding should contact a health care provider.

MENSTRUAL HYGIENE

1. *Choose your method of sanitation*: It is essential to choose one that has the lowest absorbency rate for your flow. Frequent switching between brands can make you uncomfortable.
2. *Change sanitary pad regularly*: Menstrual blood, once it has left the body gets contaminated with the body’s innate organisms. Therefore, the standard time to change a sanitary pad is once every six hours.
3. *Wash yourself regularly*: When you menstruate the blood tends to enter tiny spaces like the skin between your labia or crust around the opening of the vagina and you should always wash this excess blood away. This practice also tends to beat bad odor from the vagina region.so, it is important to wash your vagina and labia well before you change into a new pad. If you cannot wash yourself before you change make sure you wipe off the areas by using toilet papers or tissues
4. *Don’t use soap or vaginal hygiene product*: The vagina has its own cleaning mechanism that works in a very fine balance of good and bad bacteria. Washing it with soap can kill the good bacteria making way for infections. So you can use soap on the external parts but do not use it inside your vagina or vulva.
5. *Use the right washing techniques always*: Wash or clean the area in a motion i.e. from the vagina to the anus and never wash in the opposite direction. Washing in the opposite direction can cause bacteria from the anus to enter into the vagina and urethral opening leading to infection.
6. *Discard your used sanitary products properly*: It is essential to discard your used napkins or sanitary pads properly because they are capable of spreading infections. Wrap it very well before discarding it. It is also important that you wash your hand very well after discarding your used napkins.
7. *Beware of a pad rash*: A pad rash is something that you might experience during the period of heavy flow.it usually occurs when the pad has been wet for a long time and rubs along the thighs causing it to chaff.to prevents this from occurring try to stay dry during your periods.
8. *Use only one method of sanitation at a time*: Some women who have heavy flow during their periods may use several pads at a time this practice is bad because the two pads absorbs the blood and you don’t see that they are completely used up, so you are unlikely to change at regular and healthy interval. This can lead to rashes and infections.
9. *Have a bath regularly*: Having a bath is the best thing you can do for your body during your periods. Bathing not only cleanses your body but also gives you a chance to clean your private part very well.it also helps to relieve menstrual cramps, backaches and makes you feel much better at the end of it.
10. *Be ready or always prepared during your periods*: When you have your periods, it is important to be ready by making arrangement for extra cleaning and sanitary materials. Make sure you store them properly so that they don’t get contaminated

**Ovulation**

Ovulation is the part of the female menstrual cycle whereby a mature ovarian follicle discharges an egg (also known as an ovum, oocyte or female gamete). It is during this process that the egg travels down the fallopian tube where it may be fertilized by a sperm. The process of ovulation usually occurs between the 10th and 19th day into the menstrual cycle and this is the time when humans are most fertile.

Ovulation typically stops at menopause.

**Note:** that once a female child starts menstruating, ovulation automatically begins which means such a female child can get pregnant if there is sexual intercourse.

SIGNS AND SYMPTOMS OF OVULATION

1. *Change in cervical fluid or mucus*: Cervical fluid or mucus that resembles” egg white “is the sign that you are near ovulation or you are ovulating. Ovulation takes place on the day a woman has the most amount of wet fluid or mucus.
2. *Change in basal body temperature*: An increase in basal body temperature is a sign that ovulation, the cervix will be soft, high, open and wet.
3. *Breast tenderness and sensitivity*: During ovulation the breast becomes tender and sensitive.
4. *Increase libido or sexual urge*: During ovulation there is an increase in sexual urge in women
5. *Increase in the sense of vision, smell and taste*: During ovulation there is an increase in the sense of vision, smell and taste

**Fertilization**

This is the fusion of the male gamete (i.e. the sperm) and the female gamete (.i.e. the ovum) to form a zygote. It occurs in the fallopian tube of the female. After fertilization the zygote grows and develops to form the young one. The process of fertilization always results to pregnancy

**CLASSWORK 1**

1. What is ovulation?
2. State 4 ovulation sign
3. Define menstruation?

**ASSIGNMENT 1**

**SECTION A**

1. An increase in basal body temperature is one of the signs and symptoms of (a) menopause (b) pregnancy (c) growth (d) puberty
2. The vagina should be washed always with soap in other to make it healthy (a) true (b) false (c) maybe (d) partly correct
3. The fusion of the male and female gamete to form a zygote is known as (a) conception (b) fertilization (c) menopause (d) menstruation
4. Another word for menstruation is (a) period (b) pregnancy (c) fertilization (d) gamete
5. Which of these statements is true of a female child who menstruates? (a) she can become pregnant (b) she will not be happy again (c) she is easily irritated with life (d) her level of assimilation decreases

**SECTION B**

1. What is fertilization?
2. Mention 4 signs to show that someone is pregnant
3. Mention 3 menstrual disorder

**WEEK TWO**

**HUMAN REPRODUCTION (II)**

* **Pregnancy**
* **Signs and symptoms of pregnancy**
* **Stages of growth of the fetus**

**Pregnancy (conception)**

Conception is also known as pregnancy.it is the period between fertilization and the birth of the young one .In human, the period of pregnancy is about 9 months.

**Signs and symptoms of pregnancy**

1. *Food aversions*: If a woman is newly pregnant she may feel repelled by the smell of some food. She may also find that certain food she used to enjoy as suddenly completely repulsive to her.
2. *Mood swings*: It is common to have mood swings during pregnancy due to the changes in the hormone in the body every woman respond differently to these changes.
3. *Abnormal bloating*: Hormonal changes in early pregnancy may lead to the feeling of bloating that is similar to the feeling some women have just before their period
4. *Frequent urination*: Shortly after a woman becomes pregnant, hormonal changes makes a chain of events that raises the rate of blood flow through the kidneys this cause your bladder to fill more quickly so you need to pee more often
5. *Fatigue*: Pregnant women tend to always feel tired and exhausted during pregnancy and this leads to sleepiness and sluggishness
6. *Sore breast*: The breast becomes swollen and sensitive during pregnancy due to its rising levels of hormones in their body
7. *Missed period*: If a woman missed her period, it is an indication that she is pregnant. Although it is possible to still experience the monthly menstrual period even when a woman is pregnant
8. *High basal body temperature*: If you have been charting your basal body temperature and you see that your body temperature has stayed elevated for 18days in a roll it is an indication that you are probably pregnant.

CARE NEEDED DURING PREGNANCY

1. Get pregnancy test as soon as you miss your period
2. Talk with your partner and someone else you trust
3. Begin antenatal care check-ups with a medical doctor
4. Follow proper antenatal care instructions which include avoiding all drugs and medicine not prescribed by a medical doctor
5. Eat nourishing foods rich in protein, calcium folic acid, iodine and iron and drink plenty of water and fruit juices
6. Get adequate rest and relaxation
7. Do not smoke cigarettes or take alcohol

MYTHS AND FACTS ABOUT PREGNANCY

A myth refers to something that many people believe but that does not exist in the reality. It is false. On the other hand, a fact is something that is known to be true, especially that can be proved. There are myths and facts about pregnancy especially in the African traditional set up.

MYTHS ABOUT PREGNANCY

1. Only pregnancy can make a woman miss her monthly period
2. All pregnant women vomit
3. Pregnancy makes you unclean before God
4. All pregnant women have morning sickness
5. Pregnant women should not dye their hair
6. Pregnant women shouldn’t eat fish
7. I can’t get pregnant if I have my period
8. I can’t get pregnant the first time I have sex
9. If I wash out my vagina after sex I won’t get pregnant
10. Pregnant women should not take baths

FACTS ABOUT PREGNANCY

1. Pregnant women should not carry heavy objects
2. Some women may experience some bleeding and yet be pregnant
3. Pregnant women should not change cat litter
4. Pregnant women should not drink alcohol
5. You can be pregnant for over a year

**Stages of growth of the fetus**

Each month a group of eggs (called oocytes) is recruited from the ovary for ovulation (release of the egg). The eggs develop in small fluid-filled cysts called follicles. Normally, one follicle in the group is selected to complete maturation. This dominant follicle suppresses all the other follicles in the group, which stop growing and degenerate.

The mature follicle opens and releases the egg from the ovary (ovulation). Ovulation generally occurs about two weeks before a woman's next menstrual period begins. After ovulation, the ruptured follicle develops into a structure called the corpus lustrum, which secretes progesterone and estrogen. The progesterone helps prepare the endometrium (lining of the uterus) for the embryo to implant.

On average, fertilization occurs about two weeks after your last menstrual period. When the sperm penetrates the egg, changes occur in the protein coating around it to prevent other sperm from entering. At the moment of fertilization, a baby's genetic make-up is complete, including its sex.

If a Y sperm fertilizes the egg, the baby will be a boy; if an X sperm fertilizes the egg, and the baby will be a girl.

Human chorionic gonadotropin is a hormone present in your blood from the time of conception. It is produced by cells that form the placenta and is the hormone detected in a pregnancy test. However, it usually takes three to four weeks from the first day of your last period to increase enough to be detected by pregnancy tests.

Within 24 hours after fertilization, the egg begins dividing rapidly into many cells. It remains in the fallopian tube for about three days. The fertilized egg (called a blastocyst) continues to divide as it passes slowly through the fallopian tube to the uterus where its next job is to attach to the endometrium (a process called implantation). Before this happens, the blastocyst breaks out of its protective covering. When the blastocyst establishes contact with the endometrium, an exchange of hormones helps the blastocyst attach. The endometrium becomes thicker and the cervix is sealed by a plug of mucus.

Within three weeks, the blastocyst cells ultimately form a little ball, or an embryo, and the baby's first nerve cells have already formed. Your developing baby is called an embryo from the moment of conception to the eighth week of pregnancy. After the eighth week and until the moment of birth, the developing baby is called a fetus.

The development stages of pregnancy are called trimesters or three-month periods, because of the distinct changes that occur in each stage.

STAGES OF GROWTH: MONTH BY MONTH

**Month 1**

As the fertilized egg grows, a water-tight sac forms around it gradually; filling it with fluid. This is called the amniotic sac, and it helps cushion the growing embryo.

The placenta also develops. The placenta is a round, flat organ that transfers nutrients from the mother to the baby, and transfers wastes from the baby.

A primitive face will take form with large dark circles for eyes. The mouth, lower jaw, and throat are developing. Blood cells are taking shape, and circulation will begin. The tiny "heart" tube will be at 65 times a minute by the end of the fourth week. By the end of the first month, the baby is about 1/4 inch long – smaller than a grain of rice!

**Month 2**

The baby's facial features continue to develop. Each ear begins as a little fold of skin at the side of the head. Tiny buds that eventually grow into arms and legs are forming. Fingers, toes and eyes are also forming. The neural tube (brain, spinal cord and other neural tissue of the central nervous system) is well formed. The digestive tract and sensory organs begin to develop. Bone starts to replace cartilage.

The head is large in proportion to the rest of the baby's body. By the end of the second month, your baby is about 1 inch long and weighs about 1/30 of an ounce. At about 6 weeks, your baby's heart beat can usually be detected. After the 8th week, your baby is called a fetus instead of an embryo.

**Month 3**

The baby's arms, hands, fingers, feet, and toes are fully formed. The baby can open and close its fists and mouth. Fingernails and toenails are beginning to develop and the external ears are formed. The beginnings of teeth are forming. The baby's reproductive organs also develop, but the baby's gender is difficult to distinguish on ultrasound.

By the end of the third month, your baby is fully formed. All the organs and extremities are present and will continue to mature in order to become functional. The circulatory and urinary systems are working and the liver produces bile. At the end of the third month, your baby is about 4 inches long and weighs about 1 ounce. Since the baby's most critical development has taken place, the chance of miscarriage drops considerably after three months.

**Month 4**

The baby's heartbeat may now be audible through an instrument called a Doppler. The fingers and toes are well-defined. Eyelids, eyebrows, eyelashes, nails, and hair are formed. Teeth and bones become denser. The baby can even suck his or her thumb, yawn, stretch, and make faces.

The nervous system is starting to function. The reproductive organs and genitalia are now fully developed, and the doctor can see on ultrasound if the baby is a boy or a girl. By the end of the fourth month, the baby is about 6 inches long and weighs about 4 ounces.

**Month 5**

One may begin to feel the baby move, since he or she is developing muscles and exercising them. This first movement is called ***quickening***.

Hair begins to grow on the baby's head. The baby's shoulders, back, and temples are covered by a soft fine hair called ***lanugo***. This hair protects the baby and is usually shed at the end of the baby's first week of life. The baby's skin is covered with a whitish coating called vernix caseosa. This "cheesy" substance is thought to protect baby's skin from the long exposure to the amniotic fluid. This coating is shed just before birth. By the end of the fifth month, the baby is about 10 inches long and weighs from 1/2 to 1 pound.

**Month 6**

The baby's skin is reddish in color, wrinkled, and veins are visible through the baby's translucent skin. Baby's finger and toe prints are visible. The eyelids begin to part and the eyes open.

Baby responds to sounds by moving or increasing the pulse. One may notice jerking motions if baby hiccups. If born prematurely, the baby may survive after the 23rd week with intensive care. By the end of the sixth month, the baby is about 12 inches long and weighs about 2 pounds.

**Month 7**

The baby will continue to mature and develop reserves of body fat. The baby's hearing is fully developed. He or she changes position frequently and responds to stimuli, including sound, pain, and light. The amniotic fluid begins to diminish.

At the end of the seventh month, the baby is about 14 inches long and weighs from 2 to 4 pounds. If born prematurely, the baby would be likely to survive after the seventh month.

**Month 8**

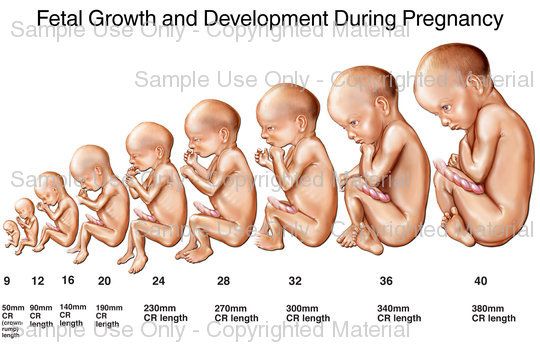
The baby will continue to mature and develop reserves of body fat. One may notice that the baby is kicking more. Baby's brain is developing rapidly at this time, and the baby can see and hear.

Most internal systems are well developed, but the lungs may still be immature. The baby is about 18 inches long and weighs as much as 5 pounds.

**Month 9**

The baby continues to grow and mature: the lungs are nearly fully developed.The baby's reflexes are coordinated so he or she can blink, close the eyes, turn the head, grasp firmly, and respond to sounds, light, and touch. Baby is definitely ready to enter the world!

One may notice that the baby moves less due to tight space. The baby's position changes to prepare itself for labor and delivery. The baby drops down in the pelvis. Usually, the baby's head is down toward the birth canal. The baby is about 18 to 20 inches long and weighs about 7 pounds.

**CLASSWORK 2**

1. What is pregnancy?
2. Give four facts about pregnancy

**ASSIGNMENT 2**

**SECTION A**

1. The following are not symptoms of pregnancy in human except (a) fighting (b) fatigue (c) crying (d) walking
2. The ideal pregnancy duration in human is (a) 6 months (b) 7 months (c) 8 months (d) 9 months
3. The fusion of the male and female gamete to form a zygote is known as (a) conception (b) fertilization (c) menopause (d) menstruation
4. The fluid that cushions the growing embryo is called (a) water (b) mineral (c) amniotic fluid (d) baby fluid
5. Pregnancy can be detected with any of these symptoms except (a) nausea (b) fatigue (c) food aversion (d) menstruation

**SECTION B**

1. Carefully state the difference between fertilization and conception
2. Mention any four signs and symptoms of pregnancy
3. Mention three ways of detecting pregnancy

**WEEK THREE**

**FORCE**

* **Meaning**
* **Types of Force**
* **Contact and non-contact force**
* **Magnetic and gravitational force**

**Meaning**

A force can be defined as any action that makes or tries to move, stop or alter the speed of a body in a given direction. Force can also be said to mean a push or a pull. The unit of force is Newton (N). Force is given by the formula:

Force (F) = Mass (m) x Acceleration (a)

F = ma

**Types of Force**

There are two types of force namely:

1. Contact force
2. Non-contact

**Contact and non-contact force**

1. CONTACT FORCES: These are forces which sources are in contact with the body to which they are applied. The contact forces could be direct or indirect. Examples of contact forces are: push, pull, tension, friction, upthrust
2. NON- CONTACT FORCES: These are forces which the sources do not require contact with the body they are applied. These forces act through a region in space called field. They are therefore also called ***force fields***. Examples include magnetic force, gravitational force and electric force

**Magnetic and gravitational force**

1. MAGNETIC FORCE: In a bar magnetic, there is North Pole end south pole end. *The like poles repel each other while unlike poles attract each other*.

Magnets can attract other magnets, iron fillings or any other metallic materials. This phenomenon show that a magnetic force acts over an area around the magnet. Thus a magnetic force is called a field force which acts over an area.

1. GRAVITATIONAL FORCE: The force which the earth attracts all objects to itself is called *the force of gravity or gravitational force*. This is the reason why objects above the earth fall down to the earth.
2. ELECTRIC FORCE: Electric force field exists between two electric charges. *Unlike charges attract each other while like charges repel each other*.

**CLASSWORK 3**

1. What is force? Give the SI unit
2. State two contact force

**ASSIGNMENT 3**

**SECTION A**

1. The correct SI unit of force is (a) Joules (b) Watt (c) Newton (d) Metre
2. Which of the following statement is false(a) a force changes the shape of a body (b) forces may be balanced or unbalanced (c) a force cannot change the direction of a moving body (d) a force changes the speed of object
3. The gravitational force can be found (a) on the earth (b) in the moon (c) around the planets (d) in the galaxy
4. The magnetic force is also known as \_\_\_\_\_\_\_\_\_(a) pulse ( b) electrical (c) field force (d) gravitational force
5. Which of the following is a type of force (a) electrical (b) heat (c) rotating (d) reversible

**SECTION B**

1. Mention three non-contact force that you know
2. State two importance of force
3. State the difference between contact and non-contact force

**WEEK FOUR**

**CALCULATION OF GRAVITATIONAL FORCE**

* **Calculation of gravitational force**
* **Balanced and unbalanced forces**
* **Frictional force**
* **Uses/Advantages**
* **Disadvantages**

**Calculation of gravitational force**

CALCULATION OF WORK DONE AGAINST GRAVITY

Suppose you lift an object of mass 1kg from the ground to a height of 1m, the work done in lifting the abject is calculated by using the formula; Mgh

Mgh = 1 x 1 x 9.8 joules (g = 9.8m/s2)

Joule is the unit of work done.

**Balanced and unbalanced forces**

When an object is stationary, the forces acting on it are balanced forces. The sum of such forces acting on the body is zero and they act in opposite direction.

When an object is in motion (moving), the forces acting on it are unbalanced. The sum of such forces is not zero. Such forces are either acting in it are direction or the same direction but are not equal in value. Unbalance forces cause a body to accelerate.

GENERAL EFFECT OF A FORCE

1. A force causes motion of an object
2. A force causes moving object to come to rest (stop)
3. A force changes the speed of a body in motion
4. A force causes changes in the direction of motion.

The S.I unit of force is the Newton, N. The force acting on an accelerating body of mass, m, is given by,

F = ma

Force acts in a specific direction. The direction of the action of a force is usually indicated by an arrow, or depending on the direction

**Friction force**

Frictional force is the force that act between the surfaces of solid objects and tends to oppose their motion over each other

**Uses/Advantages**

1. It helps in walking
2. It helps in carrying objects
3. It helps in grinding
4. It makes nails stay on the wall
5. Car brakes work by friction

**Disadvantages**

1. It causes wear and tear of machine parts of machine
2. It causes loss of energy
3. It produces unpleasant noise
4. It makes machine hot and inefficient

**METHODS OF REDUCING FRICTION**

1. By lubricating surfaces with oil or grease
2. Use of the ball bearing

**CLASSWORK 4**

1. Define frictional force?
2. Enumerate two advantages of friction
3. Highlight two disadvantages of friction

**ASSIGNMENT 4**

**SECTION A**

1. Which of the following forces requires contact for its action (a) gravitational force (b) frictional force (c) magnetic forces (d) electrical force
2. The sum of balanced forces is (a) zero (b) greater than zero (c) less than zero (d) about one
3. The S.I unit of force is (a) Kilogram (b) Watt (c) Newton (d) Power
4. All of the following are correct except one (a) forces causes motion (b) forces cause change in the direction of motion (c) forces stops motion (d) force is always parallel
5. One of the following force is non-contact force (a) electric force (b) push (c) tension (d) push

**SECTION B**

1. Calculate the force acting on a body of mass 0.6kg (g=9.8ms-2; f=mg)
2. What is the name of the instrument used to measure the weight of a body?

**WEEK FIVE**

**SPACE TRAVEL**

* **Meaning of space travel**
* **Purpose of space travel**
* **Benefits of space travel**
* **Dangers of space travel**

**Meaning of space travel**

Space travel is the act of going to the moon or planets or orbiting the earth in a special craft called spaceship. It is also the travelling to the outer space beyond the earth.

The space travelers are called ASTRONAUTS. On 21st of July, 1969, Neil Armstrong, an American became the first human being to step into the moon. He was followed on the same day by another American named Edwin Aldrin. They stayed on the moon for 21 hours 36 minutes before they lifted up. The second moon landing took place in December 1972 when two Americans, Eugene Ceman and Harrison Schmitt stayed a total of 74hours 59 minutes on the moon surface. These astronauts wore special protective uniforms with oxygen masks for breathing.

Most experiments in space are currently carried out in space station or space lab. These space stations are very large space rockets which can accommodate many people and are equipped to perform scientific experiments. Astronauts who work on these space stations usually stay for period of six months to one year after which they are replaced by other astronauts.

Spaceship is moved by rockets. After leaving the earth’s atmosphere, gravity no longer pulls the spaceship to the earth. The astronauts wear special dress called suits and it help them to maintain the earths atmospheric pressure around there body throughout in space

DEFINITION OF SPACE AND THE REGION’S OUTSIDE THE EARTH’S SURFACE

Space refers to the region of our environment outside the earth’s crust. There are three important regions outside the earth’s surface. These are:

1. *The troposphere*: It starts from the surface of the earth and extends to a height of about 16,000 meters. Most of the air and water vapour in our environment are found in this region. As one goes up in the troposphere, the temperature falls and it therefore becomes cooler.
2. *The stratosphere*: It is the region directly above the troposphere. The region contains very little air. The temperature of this region does not falls as one goes up in this region
3. *The ionosphere*: It is the upper part of the atmosphere. It contains mainly charged particles. The ionosphere is very useful to man because it enables the reflection and transmission of radio wave and signals round the world.

CHARACTERISTICS OF THE OUTER SPACE

1. Light from the sun passes through the outer space.
2. There is no force of gravity in the outer space
3. The outer space is void or empty
4. Sound does not pass through the outer space, therefore the outer space is always quite
5. Outer space is very large and beyond our imagination.

**Purpose of space travel**

1. It helps to watch everything that is happening in the world on the television e.g. football game, basketball game etc. at the same time the events are being carried out
2. Space exploration is the use of astronomy and space technology to explore outer space
3. Space travel is because of man’s curiosity it is a desire to find out the nature of life in other planets.
4. The need for more knowledge of the climate and vegetation of the earth is another reason for space travel.
5. The landing of equipment called satellite in space has also led to the improvement in communication

**Benefits of space travel**

1. The main benefit is the collection of scientific information about the earth and the other planets
2. Production of special computers
3. Production of photographic equipment such as x-ray and gamma-ray
4. Production of telecommunication equipment
5. Production of remote sensing equipment to guide spacecraft e.g. rocket
6. Production of rocket or aircraft fuels

**Dangers of space travel**

Space travel is risky. If anything goes wrong, one or more lives will be lost.

The dangers of space travel can be caused by the following problems

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

PROBLEMS OF SPACE TRAVEL

1. *High speed*: Astronauts have to be trained in order to adopt to the high speed of space travel, so that they can think and work normally while traveling in space.
2. *Complicated calculation*: There are lot of calculations involved before a spaceship can be launched correctly at an angle, speed and time to arrive at its destination. This is because the earth, the moon and all the planets are always in rapid motion.
3. *Loss of weight*: The force of gravity is not felt in space, therefore it is very difficult for astronauts to stand or walk as they do on earth.
4. *Lack of basic need of life*: The basic needs of life such as water, oxygen, food etc. are not available in the space, therefore oxygen and water must be made available in the spaceship to last for the period of the trip in space.
5. *Escape* *velocity*: Rockets require escape velocity to escape from the attraction of the earth or the force of gravity
6. *Force of gravity*: The force of gravity makes it difficult for any spacecraft to escape the earth’s surface easily. It has to be at a very high speed before the spacecraft can be allowed to leave the earth’s surface.

**CLASSWORK 5**

1. What is a space?
2. Mention the three region of space
3. State 5 dangers of space travel

**ASSIGNMENT 5**

**SECTION A**

1. The first man to travel to the moon is \_\_\_\_ (a) Neil Armstrong (b) Sir Isaac Newton (c) Maxwell Planks (d) Sir Bobby Charlton
2. Which of the following is not associated with space travel (a) Basic need of life (b) force of gravity (c) electricity (d) escape velocity
3. The regions outside the earth are the following except (a) troposphere (b) stratosphere (c) talkosphere (d) ionosphere
4. The escape velocity is used by rocket to \_\_\_\_\_\_\_(a) overcome the force of gravity (b) escape from danger (c) hide from enemies (d) speed faster and disappear
5. Which of these is not characteristic of outer space? (a) no force of gravity (b) quiet (c) empty (d) very small

**SECTION B**

1. What is space travel?
2. Mention three purpose of space travel
3. Define troposhere

**MID TERM PROJECT**

Using a **WHITE CARDBOARD ONLY**, draw and label the solar system

**WEEK SIX**

**GRAVITATION AND WEIGHTLESSNESS**

* **Meaning**
* **Effect**

**Meaning**

GRAVITATION

Gravitation is a force that has effect on the stability of a body.

If an object is tossed up the air, it will full back to the ground because the earth exerts an attraction on it. This attraction is called gravitational attraction.

The gravitational attraction / force between any two object increases as the two objects approach each other.

The earth has a great gravitational full because it has a great mass. The gravitation pull of the earth is always directed to the center.

WEIGHTLESSNESS

Weightlessness is a feeling of being weightless. It does not mean having no weight. As someone move away from the surface of the progressively reduces. In the outer surface of the earth, a person or body has no weight because the gravitational pull of the earth is no longer acting there.

**Effect of gravitation on objects**

1. *Stability of the earth*: Gravitation helps every object in the earth include man to remain stable
2. *Weight*: The weight of an individual is a measure of the gravitational pull of the earth on that person
3. *Revolution of the moon round the earth*: The moon is able to revolve round the earth because the gravitational pull of the earth attracts it
4. *Balance of planets in our solar system*: The sun and all the planets in our solar system exercise gravitational pulls on one another and mutually balance on another in space
5. *Work is done against gravity in lifting an object form the earth*: Lifting an object from the ground involves opposing gravitational pull, therefore work is done against gravitational attraction of the earth

**CLASSWORK 6**

1. Define gravitational pull
2. What is weightlessness?

**ASSIGNMENT**

**SECTION A**

1. The earth’s gravitational pull on an object is represented by that object’s (a) weight (b) size (c) volume (d) materials
2. The ability of an object to remain stable on earth is due to \_\_\_\_\_\_(a) gravitational pull (b) weightlessness (c) moon and earth sizes (d) its height
3. Gravitational force is a force of (a) separation (b) attraction (c) friction (d) opposition
4. The earth has a large gravitational pull on object because the earth (a) has plants and animals (b) is a planet (c) is large in size (d) revolves
5. When a metal ball of 20kg and a wooden ball of 10kg are dropped from the some height(a) the metal ball reach the ground before wooden ball (b) both balls will reach the ground at the same time (c) the wooden ball falls faster than metal ball (d) the metal ball null full sideways

**SECTION B**

1. Explain weightlessness
2. State four effects of gravity on an object.

**WEEKS SEVEN AND EIGHT**

**EARTH AND SPACE**

* **Solar system**
* **Rotation and revolution**
* **Eclipse**
* **Season**

**Solar system**

The sun and all the bodies orbiting round it makes up the ***solar system***. The planets and their moons are the main bodies that revolve round the sun.

Other bodies in the solar system are ***asteroids, comets, and meteoroids***.

THE PLANETS

Nearest to the sun is *mercury,* the smallest of the planets. Then come Venus, Earth, Mass, Jupiter [the biggest planet], Saturn, Uranus, Neptune, and Pluto. The distance across the solar system is about 12000million kilometers.

PLANET

1. Mercury
2. Venus
3. Earth
4. Mass
5. Jupiter
6. Saturn
7. Uranus
8. Neptune
9. Pluto

**Rotation and revolution**

*Rotation*: This is the movement of a planet about its axis. Rotation of the earth brings about night and day.

*Revolution*: This is movement of a planet round the sun in the solar system. The Earth revolves round the sun giving rise to seasons. The earth takes approximately 365 days to revolve round the sun.

**THE EARTH**

The earth is the third planet from the sun and it is the only known planet in the universe that harbors living things. The earth contains water which in addition to the oxygen assists in supporting life on earth.

The earth does not produce light hence it is said to be non-luminous.

While those heavenly bodies that give out light, such as the stars and the sun are said to be luminous.

The earth has only one satellite called the moon. The moon revolves round the earth. The earth rotates about its axis giving rise to day and night.

**THE SUN**

The sun is the single biggest star in the universe that supplies all planets light and heat. The sun does not rotate. Earth revolves round the sun giving rise to seasons. The earth takes approximately 365 days to revolve round the sun. There is no water or atmosphere in the sun.

**THE MOON**

The moon is the only earth satellite that revolves round its axis. The moon gives a reflection of light from the sun and supplies the earth with moon light. The moon is non- luminous and has no life on it.

**Eclipse**

Eclipse is the full or partial blocking of light from one celestial body by another celestial body

Types of eclipse

* + - 1. *Eclipse of the sun:* This occurs when the moon moves between the sun and the earth and all are exactly in a straight line.
      2. *Eclipse of the moon:* It occurs when the earth is between the sun and the moon and the three are exactly on a straight line.

**NOTE**: There is nothing like eclipse of the earth.

**Climate and Seasons**

***Climate*** can be defined as the average weather condition of a particular area for a given period of time.

***Seasons*:** The revolving of the earth about the sun gives rise to seasons.

Different parts of the surface of the earth have the sun shining on them at different times of the year.

There is a time when there are shorter days and longer nights during some months in a year, and also shorter nights and longer days during some other months.

There are also some months during which the days and nights are equal in duration. This happens because the earth moves in an orbit around the sun. The earth tilts in opposite direction twice a year, hence, giving rise to two seasons –Rainy and Dry seasons

**CLASSWORK 7&8**

1. What is solar system?
2. How many planets do we have? Mention them
3. What is climate?

**ASSIGNMENT 7&8**

**SECTION A**

1. The sun and all the bodies orbiting round it makes up the (a) solar system (b) galaxy (c) meteoroids (d) comets
2. How many planets do we have (a) 1 (b) 5 (c) 9 (d) 12
3. The third planet after the earth from the sun is (a) mass (b) mercury (c) Jupiter (d) Saturn
4. The average weather condition of a particular area for a given period of time is (a) weather (b) season (c) climate (d) session
5. Other bodies in the solar system include the following except(a) asteroid (b) comets (c) water (d) meteoroids
6. The revolving of the earth about the sun gives rise to(a) day (b) night (c) seasons (d) sun
7. Which of the following pairs are not both planets (a) Mercury and Saturn (b) Earth and Moon (c) Venus and Mars (d) Jupiter and Pluto
8. Rotation of earth about its axis causes(a) climate (b) season (c) day and night (d) evening
9. ………. is the full or partial blocking of light from one celestial body by another celestial body (a) rotation (b) revolution (c) eclipse (d) climate
10. Which of the following is odd? (a) Mercury, Venus and Earth (b) Saturn, Uranus and Pluto (c) Earth, Mars and Jupiter (d) Jupiter, Saturn and Uranus

**SECTION B**

* + - 1. Define the following terms (a) eclipse (b) revolution of the earth (c) rotation of the earth
      2. Differentiate between climate and season?

**WEEK NINE**

**SATELLITE**

* **Meaning**
* **Uses**

**Meaning**

Satellite is a body that orbits or moves round a planet e.g. the moon is a satellite of the earth.

Thus, the satellites or moons of the planet in our solar system are shown below

**PLANET** **NO OF SATELLITE**

Mercury None

Venus None

Earth 1

Mass 2

Jupiter 12

Saturn 9

Uranus 5

Neptune 2

Pluto None

**NATURAL AND ARTIFICIAL SATELLITES**

The moons that orbit the planets in solar system are natural satellite while artificial satellite are moon made bodies, which were launched by various countries, and now orbiting the earth e.g.

**COUNTRY** **YEAR OF FIRST LAUNCH** **FIRST SATELLITE**

USSR 1957 Sputnik 1

USA 1958 Explorer 1

Australia 1964 Blue streak

France 1965 Asterix

Japan 1970 Osumi

China 1970 Dong fang hang 1

United Kingdom 1971 Prospero X-3

India 1979 Rohini 1

Israel 1988 Ofeg 1

Nigeria 2003 SAT 1

**Types and Uses of satellite**

* + - 1. *Astronomical satellites*: They are used for observation of distance plants, galaxies and other outer space objects
      2. *Bio satellites*: These are used to carry living organism especially for scientific experimentation
      3. *Observation satellites*: They are used for geographical studies, photographing of areas, map marking
      4. *Weather satellites*: These are used to monitor the weather conditions in the atmosphere and supply the information to ground stations
      5. *Communication satellites*: They are designed purposely to send information quickly from one place to another
      6. *Reconnaissance satellites*: They are used for military or intelligence purposes, such as observing enemy location or troop movements
      7. *Space station satellites*: They are designed for human being to live on in outer space. They are only designed for periods of weeks, months or years
      8. *Navigational satellites*: These used radio time signals, it enable mobile receivers on the ground to determine their exact location

**CLASSWORK 9**

What is a satellite?

Give the number of satellite for the following planets (i) Neptune (ii) Jupiter (iii) Uranus

**ASSIGNMENT 9**

**SECTION A**

1. The heavenly body that moves round the planet is called (a) earth (b) sun (c) satellite (d) stars
2. Identify the planet with the least number of satellite in the following (a) earth (b) Saturn (c) Venus (d) Jupiter
3. The following are examples of planet except \_\_\_\_\_\_ (a) moon (b) earth (c) mass (d) Jupiter
4. Which of these satellites is for monitoring the dry and wet season of a particular area? (a) astronomical satellite (b) weather satellite (c) bio satellites (d) communication satellite
5. Which of the following is not a use of satellite? (a) communication (b) photograph (c) weather monitoring (d) driving

**SECTION B**

1. Highlight three uses of satellites
2. Briefly explain the effect of artificial satellites in improving the world

**WEEK TEN**

* **Meaning of teenage pregnancy**
* **Causes of teenage pregnancy**
* **Consequences and implications of teenage pregnancy**
* **Physical, social and emotional implication**
* **Effects of drugs, self-medication and drug abuse during pregnancy**
* **Causes and consequences of birth defects**

**Meaning of teenage pregnancy**

Teenage pregnancy is defined as a pregnancy in a young woman who has not reached her 20th birthday when the pregnancy ends, regardless of whether the woman is married or is legally an adult. Worldwide, rates of teenage pregnancy range from 143 per 1000 in some sub-Saharan African countries to 2.9 per 1000 in South Korea.

Pregnant teenagers face many of the obstetrics issues as women in their 20s and 30s. However, there are additional medical concerns for mothers age 14 or younger, especially if they live in a developing country. For mothers between 15 and 19, risks are associated more with socio-economic factors than with the biological effects of age.

**Causes of teenage pregnancy**

There are many factors that cause teenage pregnancy. These include:

1. **Social belief**: In some societies, early marriage and traditional gender roles are important factors in the rate of teenage pregnancy. For example, in some Sub- Saharan African countries, early marriage is often seen as a blessing because it is a proof of the young woman’s fertility. In the Indian sub-continent, early marriage and pregnancy is more common in traditional rural communities compared to the rate in cities.
2. **Lack of sexuality education**: The lack of education on safe sex, whether it is from parents, school or otherwise is a cause of teenage pregnancy. Many teenagers are not taught about methods of birth control and how to deal with peers who pressure them into having sex before they are ready.
3. **Lack of use of contraceptive methods**: The use of a method with a high failure rate is a factor in teenage pregnancy
4. **Use of drugs and alcohol**: Inability to reduce drugs and alcohol may possibly encourage unintended sexual activity. Teenagers who engage in drug use are more likely to engage in sex. The drugs with the strongest evidence linking to teenage pregnancy are cannabis, alcohol and amphetamines including “ecstasy”
5. **Poverty**: Poverty is associated with increased rates of teenage pregnancy. Economically, poor countries have far more teenage mothers compared with economically rich countries.

**Consequences and implications of teenage pregnancy**

Adolescent pregnancy refers to pregnancy in a girl between the ages of 10 to 19. Adolescent pregnancy is usually unwanted and unintended. It can be dangerous for both the mother and the unborn child.

The consequences of adolescent pregnancy and delivery include the following:

1. It can lead to induced hypertension which can cause heart failure and death of both the mother and the child
2. It can also lead to premature labour and spontaneous abortion
3. Health risks include infection, incomplete abortion, injuries to genital organs etc.
4. Termination of education
5. Life plans and career goals are disrupted
6. Feeling of loss of childhood and adapting to adulthood
7. Poverty
8. Forced marriage

**IMPLICATIONS OF TEENAGE PREGNANCY**

Teenage pregnancy is usually unintended and unwanted. It can be dangerous both to the mother and the unborn child. The implication of teenage pregnancy can be categorized into four. These are:

1. Health implication
2. Unsafe abortion
3. Social economic implication
4. Emotional implication

**1. Health implication:** Teenage pregnancy could result in a lot of health risks. Some of these include:

i. Pregnancy induced hypertension, which can cause heart failure and death of both the mother and child

ii. Premature labour or spontaneous abortion

iii. Iron deficiency anemia which reduces the chances of surviving and excessive bleeding

iv. Incomplete abortions

v. Infections and injuries to genital organs

**2. Unsafe abortion:** Adolescents are the most likely to seek abortions from untrained and unqualified health care providers. They may also attempt induced abortion. Unsafe abortion can also lead to a number of health risks and loss of life

**3. Socio-economic implications:** These include the following:

i. Termination of education

ii. Disruption of life plan and career goals

iii. Early and forced marriage due to pregnancy

iv. Stigmatization and isolation from peers

v. low self esteem

vi. Few job opportunities, low income and poverty

4. **Emotional or psychological implication**: Some of these are:

i. loneliness and depression

ii. Feeling of guilt and fear

iii. Feelings of insecurity

iv. Emotional or psychological imbalance as a result of loss of childhood and adapting to adulthood

**Causes and consequences of birth defects**

A birth defect is a problem that occurs when a baby is developing in the uterus (womb). Birth defects can be minor or severe.

The causes of birth defect include the following:

1. Genetics: These are abnormalities transferred by parents to their children. Genetic birth defects happen at conception and often cannot be prevented
2. Non genetic: These are caused by harmful habits or dangerous exposures of the pregnant mothers. Some of these habits or dangerous exposures are:
3. Smoking
4. Using illegal drugs
5. Taking alcohol
6. Exposure to toxic chemicals
7. Untreated bacterial or viral infections

The most common types of functional or developmental birth defects include:

1. Down syndrome – causes delay in physical and mental development
2. Sickle cell disease
3. Cystic fibrosis – this damage the lungs and the digestive system

**CLASSWORK 10**

1. Explain “teenage pregnancy” in your understanding
2. Enumerate four major causes of teenage pregnancy

**ASSIGNMENT 10**

**SECTION A**

1. The following factors EXCEPT ONE can lead to teenage pregnancy (a) social belief (b) ignorance of sexuality (c) social problem (d) rapid progress
2. Which of the following is the consequence of adolescent pregnancy? (a) Sexual pleasure (b) termination of education (c) happy marriage (d) proper education
3. The following will not cause of birth defect except (a) smoking (b) illegal drugs (c) balanced diet (d) bacterial infection
4. Teenage pregnancy should be discouraged in the twenty first century (a) true (b) false (c) disagree (d) maybe
5. Pregnancyby human female under the age of twenty is called \_\_\_\_(a) child pregnancy (b) female pregnancy (c) under age pregnancy (d) teenage pregnancy

**SECTION B**

1. Give three implications of teenage pregnancy
2. Enumerate three causes of teenage pregnancy

**WEEK ELEVEN**

Revision

**WEEK TWELVE**

Examination