week 1

SCIENCE AND DEVELOPMENT

Meaning of gravitation

Gravitation is a type of force which acts on a body across a distance. It is the force of attractión that exists between two masses which are separated by a distance. The force that tries to pull them towards each other is gravitational force.

Gravitational force is dependent on:

(a) the size of the body (b) the distance between the bodies.

The larger the bodies, the greater the force of attraction between the bodies. The more or

the larger the distance between the bodies,the lesser the force of attraction between them.

Gravitational force decreases greatly, when the distance separating the bodies increases

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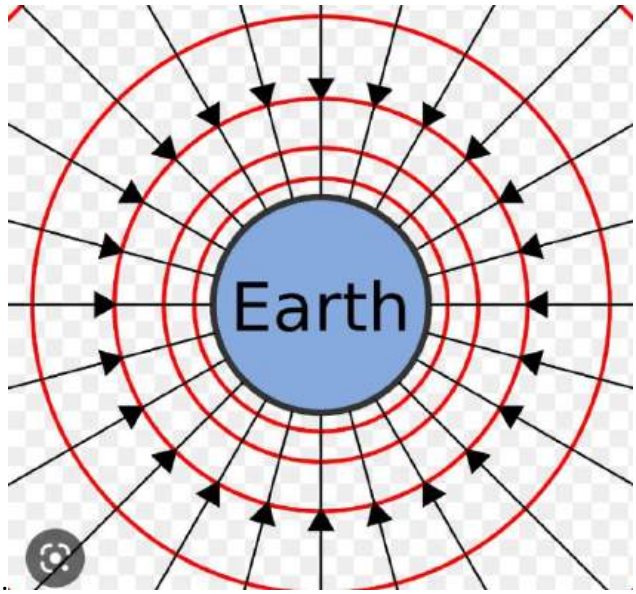
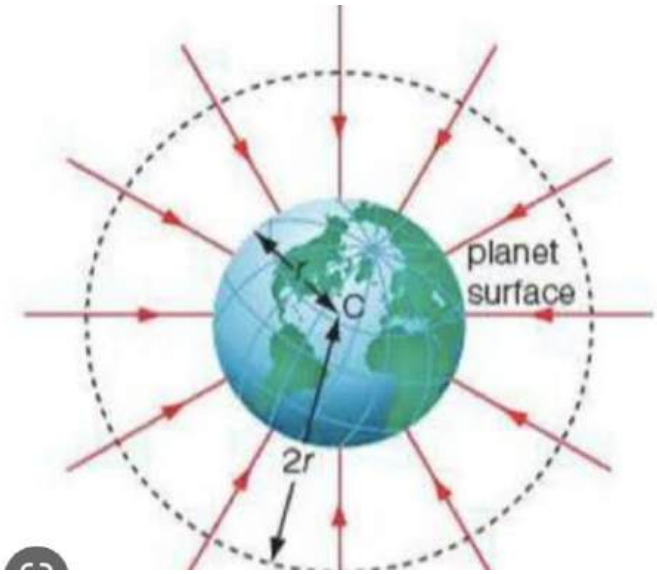




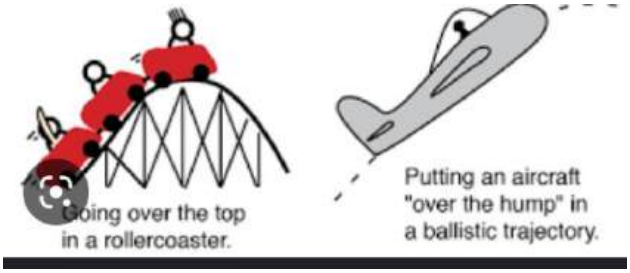
weightlessness

Weight is a force which acts on any object as a result of the pull of gravity on the body. As

one goes farther and farther away from the centre of the earth, the size or magnitude of

the force becomes smaller. Gravitational force can never reduce to zero.

Weightlessness is just a feeling of having no weight, but it does not mean that the objects have no weight.



Effects of gravitation on objects

1.All objects have weights because of gravitation.

2. Objects are able to stay where we put them and do not float about due to gravitation.

3. Man can walk erect due to gravitation.

4. Anything thrown up, falls back to the ground because of gravitation.

5. Water can be fetched in a bucket, without pouring off or floating away because of gravitational force.

6. Buckets can hold water because of gravitation.

week 2

SCIENCE AND DEVELOPMENT

The Earth in Space.

The solar system

The solar system is the sun ,the collection of the eight planet together with smaller bodies in the form of asteroids,meteroids and comets.the planets that make up the solar system in order of distance from the sun are Mercury ,Venus,Earth,Mars, Jupiter, Saturn, Uranus and Neptune the solar system is elliptical in shape I e it is shaped like an egg.

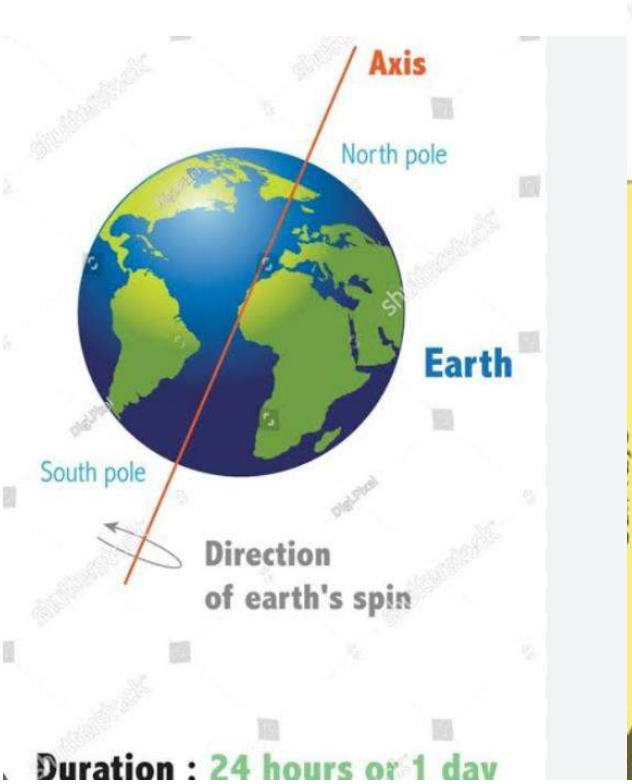
The earth (The Globe)

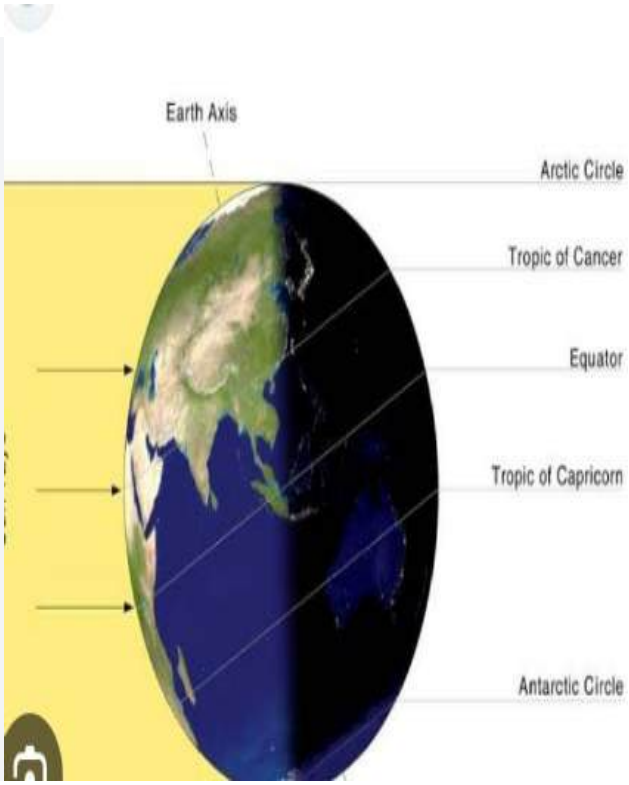
The earth is one of the planets that make up the solar system.it is spherical in shape like the globe.The earth is the only planet that habour plants and animals.it is the fifth largest planet The imaginary line on the globe on which the rotation of the earth takes place is known as the Earth's axis.

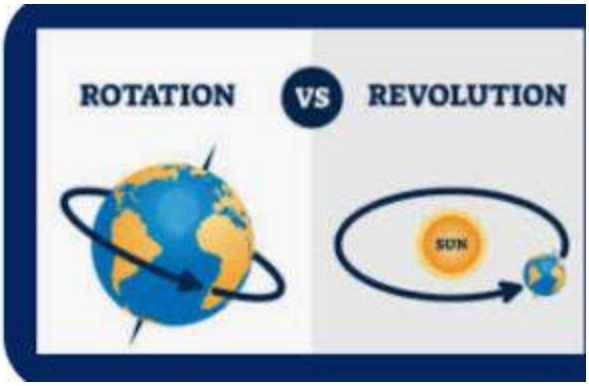
Rotation of the earth

Rotation of the earth refers to the spinning of the earth on its axis.

The sun is a stationary body. This means that it does not move. The rotation of the earth makes it appear as if the sun is moving. The earth rotates and completes one rotation on its axis every 24 hours. The rotation of the earth on its axis causes day and night. How? As the earth turns, half of the earth faces the sun, and it will be daytime in places that fall on this part, while it will be night on the half part facing away from the sun.

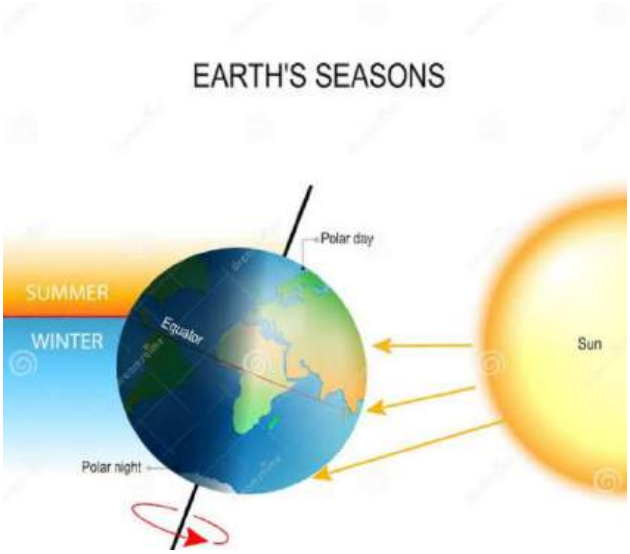






Earth's revolution around the sun.

Revolution is the movement of the earth around the sun. It take the earth $365^{1}/_{4}$ days to make one revolution. The different positions of the earth from the sun at different points dictate the climatic conditions, such as daily temperature, rainfall, wind, and humidity.the tilt or the inclination of the axis of the earth creates the seasons and causes the height of the sun at noon to increase and decrease as the seasons change.



week 2 b.

SPACE TRAVEL

Space can be define as the environment outerside the earth's crust which stretches beyond our imagination.

Outer space is refers to the region lying beyond 160km above the earth's surface. This region does not contain much air, but contains dangerous radiations, moons, stars and other planets.

Man has been curious to increase his knowledge about what exists in outer space and in other planets as well as whether there is life in other planets. Scientists are eager to find out whether people can live On other planets. It is as a matter of scientific curiosity that man developed the urge for space travel.

Space travel is refers to man's attempt to explore the region of outer space through the use of rockets, robots and other devices that help him (man) to gain both knowledge and experience of the nature and conditions of outer space. Space vehicles are also known as spacecrafts.

Space vehicle are used for transporting humans,animals and cargo to and from orbit around the earth.

Reasons for space travel

Several reasons have been given for embarking on space travel and these include to:

1.One embark on space travel to search for knowledge on the possibility of life on other planets.

2.Space travel helps to boost national prestige and acquire a Super power status.

3.It helps to show advancement in scientific and technological developments.

4.It helps to show military might which intimidate opponents.

5.It heps to show economic might as only the super rich nations can afford space travel.

Merits of space travel

There are a number of advantages that have been derived from space travel. These include:

(1) gaining knowledge about the inability of the moon and other nearby planets to support the existence of life.

(2) the reduction in the possibility of nuclear war since there is no other planet that the nationals of any nation can escape to.

(3) the invention of more reliable vehicles for space travels;

(4) several superstitious beliefs about the moon and other planets being disregarded.

Problems of space travel

(1) some nations cannot afford the huge cost required to construct, test and undertake space missions which runs into billions.

(2) There is also problem of returning to earth, should the vehicle fail in flight;

3) there is a problem of overcoming the condition of weightlessness in flights;

4) To provide food, water and air to people on space journey is also a problem.

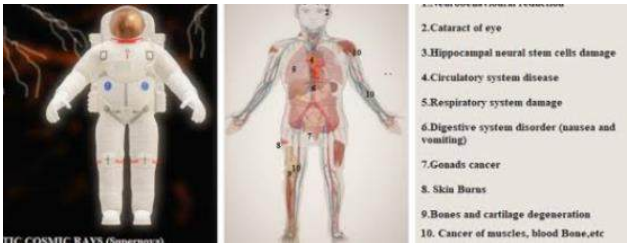
5) To overcome the earth's gravitational pull to enable spacecraft to travel smoothly beyond the earth's atrmosphere.

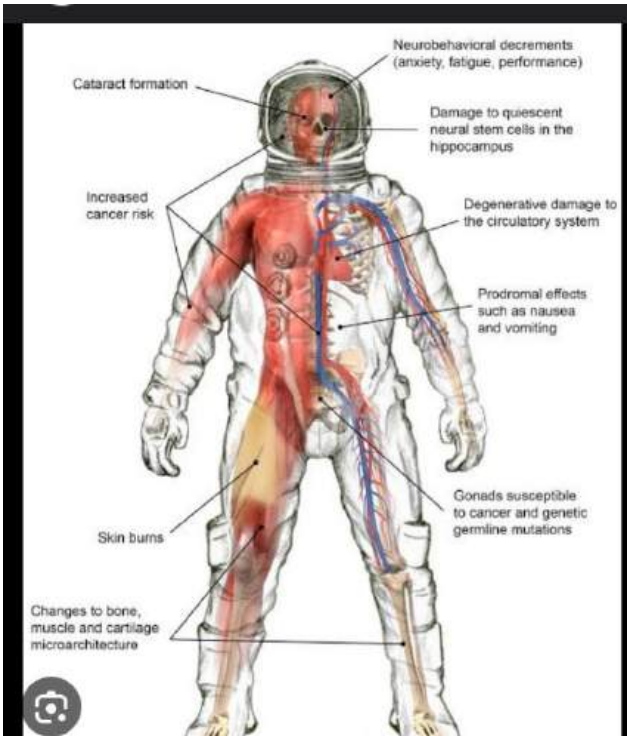
Dangers of space travel on humans

1.The presence of penetrating radiation in space which makes space travel dangerous.

2.There is possibility of failure in spacecraft which may lead to loss of the spacecraft and crew .

3.The crews that travelled may bring back unknown diseases and germs to earth which can cause epidemic and loss of lives.





week 3

SATELLITE

A satellite is an object, typically a spacecraft, placed into orbit around a celestial body. They have a variety of uses, including communication relay, weather forecasting, navigation, broadcasting, scientific research, and Earth observation.

There are two types of satellite

1. Natural satellite: The moons that orbit the planets are called natural satellites.The earth has one natural satellite.

2. Artificial satellites:These are man made spaceships or rockets launched into space and made to revolve round the earth. Several artificial satellites have been launched into space by some countries of the world.

Satellites orbit planets on definite paths. There are more than 100 artificial satellites orbiting the earth. The USA, Russia, China and Nigeria are some of the countries that have launched satellites into space.

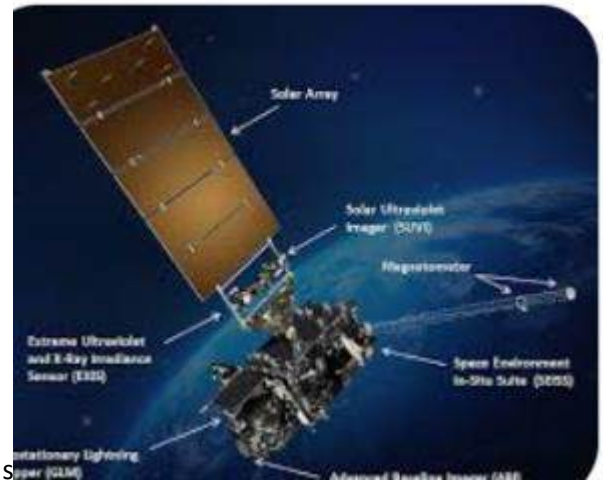
Artificial satellites or rockets are launched into space for specific purposes. Some are put into space to gather information, take photographs of places and explore for mineral resources.

IMPORTANCE/USES OF SATELLITES

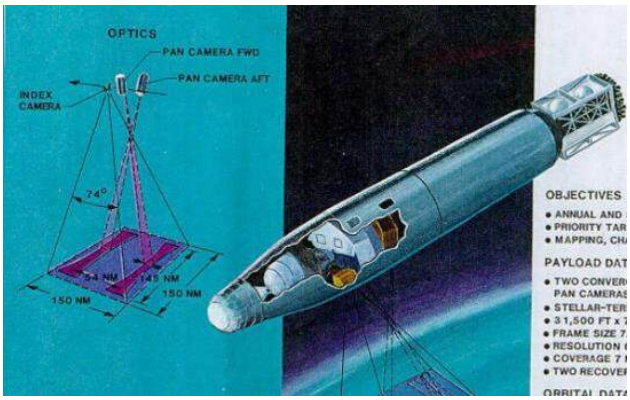
1. Observation satellites:These are satellites used to take photographs of places, to assist in producing maps, taking censuses and finding the locations of minerals in the ground. Such data make up the geographic information system (GIS).

2. Communication satellite:Communication satelites carry special instruments that obtain and send iformation from one place to another

3. Weather satellites:These satellites monitor Weather conditions in the atmosphere, supply the information to ground stations, which in turn interpret it and make weather forecasts. Such satelites carry special cameras which photograph the clouds



4.scientific or space probe satellites.These satellites carry scientific instruments which obtain information about radiation levels,temperatures and meteors in space.



5.Reconnaissance satellites: These are military satellites used to gather intelligence reports other countries, situations and events.

NIGERIAN SURVEILLANCE SATELLITE

in 2007, the National Space Research and Development Agency (NASRDA), with technical assistance from China, manufactured a satellite called NIG-COM SAT 1 (Surveillance satellite), and launched it to orbit the earth.

It was used in mapping the boundaries between states and monitoring happenings on the ground.

However, NIG-COM SAT 1 developed some technical faults, that made it leave its orbit, and was

lost in space.

Afterwards, Nigeria developed a communication satellite known

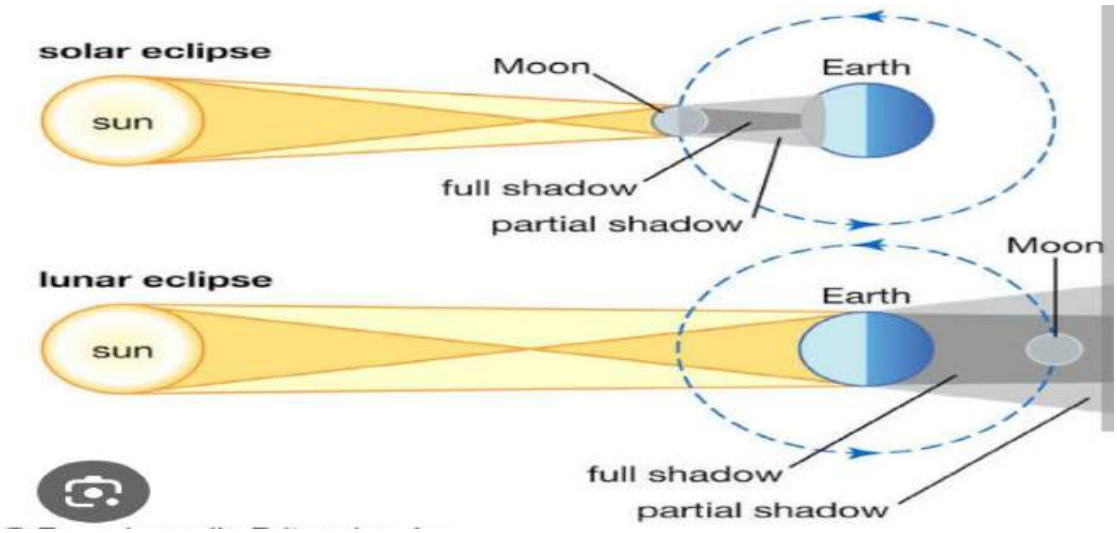
as NIG COMSAT-IR, which was launched in 2011.

week 4

Eclipses

Eclipse occurs when the path of the sun is blocked either by the earth or the moon.

Imagine what happens if the day suddenly turns completely dark for a period of time. The moon can also go dark in a similar way at night. Each of such sudden dark periods during daylight is known as an eclipse.



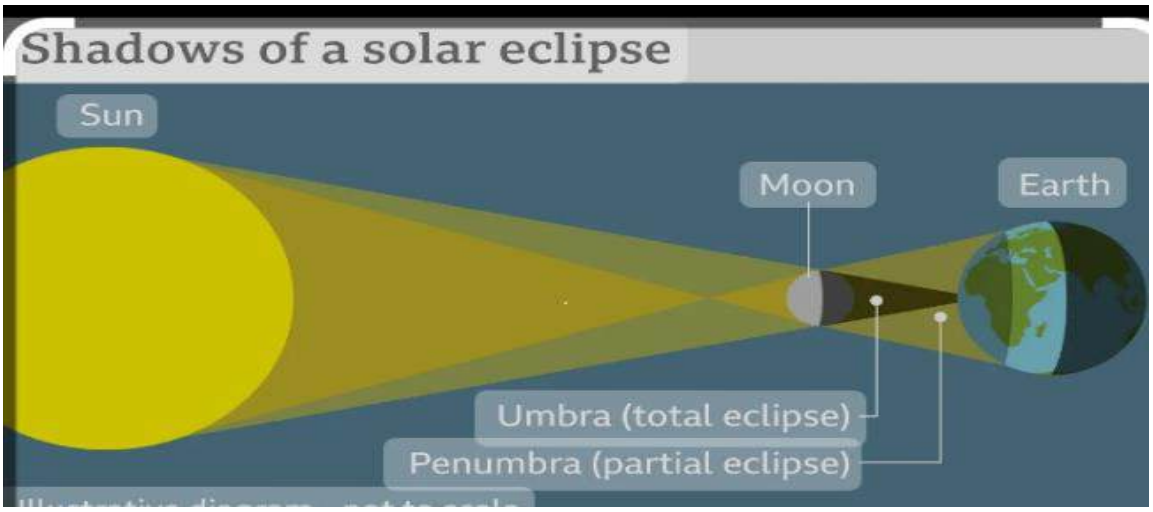
A shadow is an impression that is formed when an opaque object blocks the part of light. Depending on the source of light, the shadow may be total or partial.

An extended source of light will produce two types of shadows: umbra (total) and penumbra (partial).

Eclipse of the sun

An eclipse of the sun is also called a solar eclipse. It occurs when the moon gets directly between the earth and the sun as it orbits.

Two types of shadows, total and partial may now fall on the earth or parts of it. At this period, the earth or parts of it will not see the sun for sometime during the day, until the moon moves out of that point.

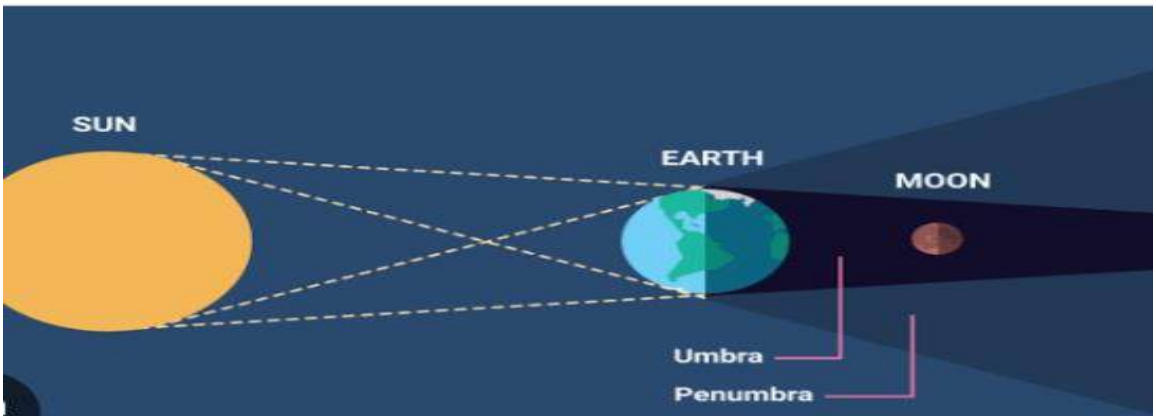


Another eclipse of the sun, which may occur, is the annular eclipse. This occurs when the moon is far away from the earth than usual, so that it casts a smaller shadow on earth that blocks out only the centre of the sun. So, only a partial shadow falls on the earth at this period.

Eclipse of the moon

An eclipse of the moon happens when the earth moves between the sun and the moon. When

this happens, the earth blocks the rays of light from reaching the moon, so that the shadow of the earth is cast on the moon for some time.



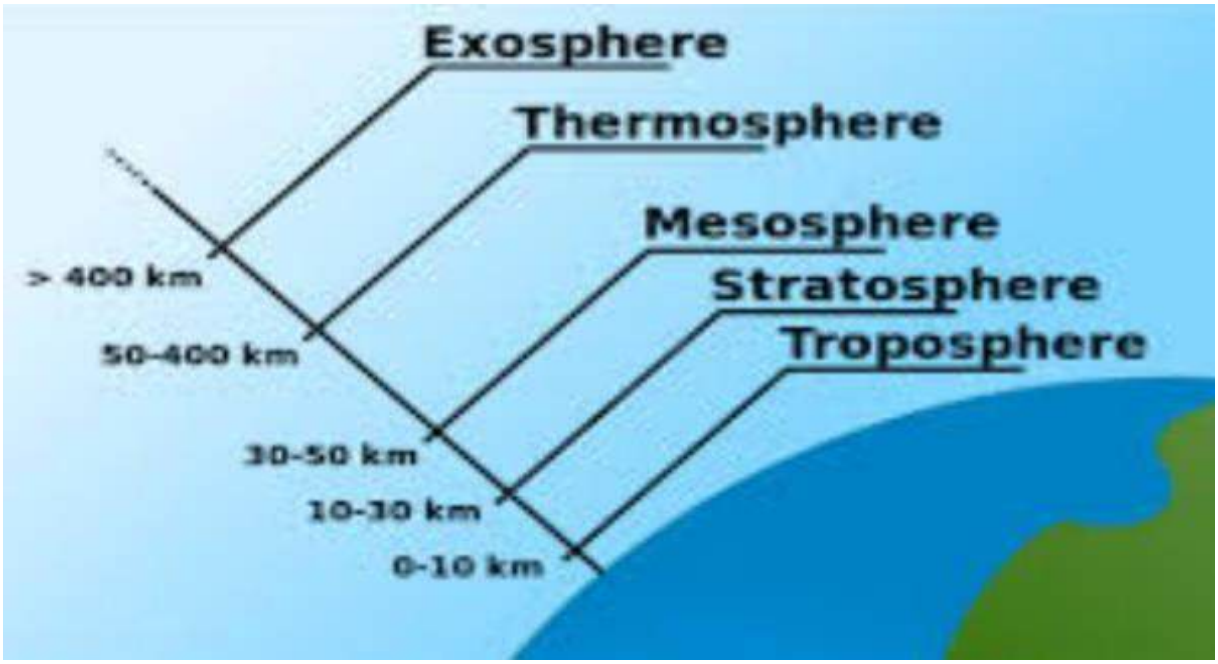
There are two types of lunar eclipse, that is, the eclipse of the moon.

1. Total lunar eclipse occurs when the earth's shadow covers the entire moon.

2. partial lunar eclipse occurs when the earth's shadow falls on only a part of the moon.

week 5

The atmosphere



Atmosphere is a blanket of gases that surrounds Earth.

It is held near the surface of the planet by Earth's gravitational attraction. Argon, oxygen and nitrogen from the three main constituents of the atmosphere.

"Atmosphere is a protective layer of gases that shelters all life on Earth, keeping temperatures within a relatively small range and blocking out harmful rays of sunlight."

Features of the Atmosphere:

1.Helps retain the sun's heat and prevents it from escaping back into space.

2. Protects life from harmful radiation from the sun.

3.Plays a major role in Earth's water cycle.

4. Helps keep the climate on Earth moderate.

Layers of Atmosphere

The atmosphere has five distinct layers that are determined by the changes in temperature that happen with increasing altitude. Layers of Earth’s atmosphere are divided into five different layers as:

Exosphere

Thermosphere

Mesosphere

Stratosphere

Troposphere

Layers of Earth's Atmosphere

The hierarchical arrangement of various layers of the Earth’s atmosphere

Troposphere

The troposphere is the lowest layer in the atmosphere. It extends upward to about 10 km above sea level starting from ground level. The lowest part of the troposphere is called the boundary layer and the topmost layer is called the tropopause. The troposphere contains 75% of all air in the atmosphere. Most clouds appear in this layer because 99% of the water vapour in the atmosphere is found here.

Stratosphere

Above the troposphere lies the stratosphere which extends from the top of the troposphere to about 50 km (31 miles) above the ground. The ozone layer lies within the stratosphere. Ozone molecules in this layer absorb high-energy ultraviolet (UV) light from the Sun and convert it into heat. Because of this, unlike the troposphere, the stratosphere gets warmer the higher you go!

Mesosphere

Above the stratosphere is the mesosphere and it extends to a height of about 85 km (53 miles) from the ground. Here, the temperature grows colder as you rise up through the mesosphere. The coldest parts of our atmosphere are located in this layer and can reach –90°C.

Thermosphere

Thermosphere lies above the mesosphere and this is a region where the temperature increases as you go higher up. The temperature increase is caused due to the absorption of energetic ultraviolet and Xray radiation from the sun. However, the air in this layer is so thin that it would feel freezing cold to us! Satellites orbit Earth within the thermosphere. Temperatures in the upper thermosphere can range from about 500° C to 2,000° C or higher. The aurora, the Northern Lights and Southern Lights, occur in the thermosphere.

Exosphere

Exosphere is the final frontier of the Earth's gaseous envelope. The air in the exosphere is constantly but gradually leaking out of the Earth's atmosphere into outer space. There is no clear cut upper boundary where the exosphere finally fades away into space.

Ionosphere

The ionosphere isn't a distinct layer unlike other layers in the atmosphere. The ionosphere is a series of regions in parts of the mesosphere and thermosphere where high-energy radiation from the Sun has knocked electrons loose from their parent atoms and molecules.

Summary of Layers of Atmosphere

Region.	(km)	Temperature Range	Important Characteristics
Troposphere	0-10	15 to -56	Weather occurs here

Stratosphere	10-50	-56 to -2	The ozone layer is present here
Mesosphere	50-85	-2 to -92	Meteors burn in this layer
Thermosphere	85-800.	-92 to 1200	Auroras occur here

week 6- 7

What is reproduction?

Reproduction is the process in which parents produce offspring of their

their kind. Reproduction involves the gametes from the parents.

Types of reproduction

1.Sexual reproduction.

2. Asexual reproduction.

PARTS S OF THE HUMAN REPRODUCTIVE SYSTEM AND THEIR FUNCTIONS

Human reproduction involves two individuals of opposite sex, male and female, and their reproductive organs are not the same.

The male reproductive organs and function

1.Testes :Produce millions of sperm cells.

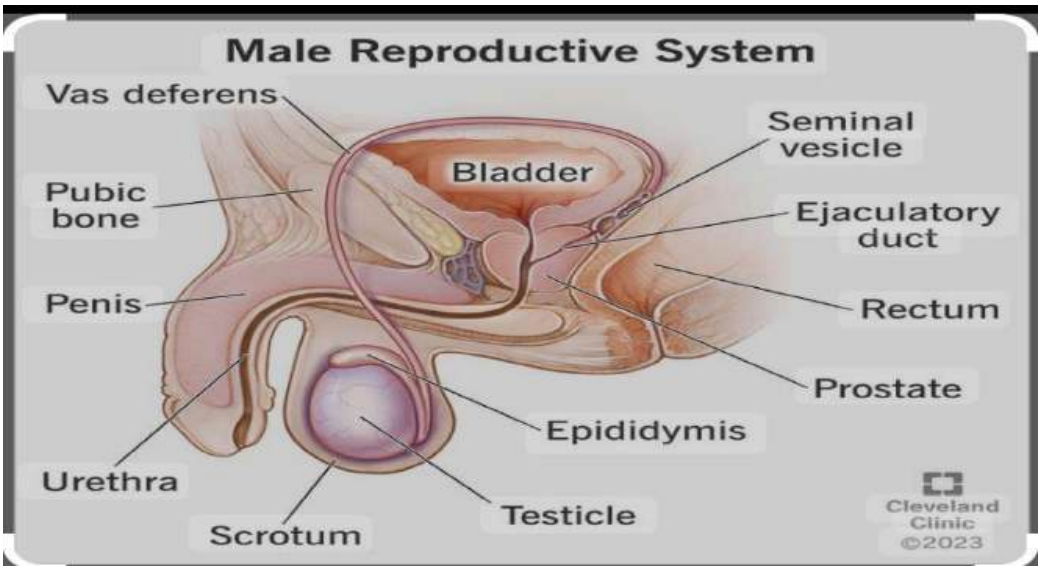
2.Scrotum:The skin which protects the testes.

3. Sperm duct:Connects the testes to the bladder.

4.Penis:For sexual intercourse and to release the sperms.

5.Urethra:The passage in the penis through which sperms are

discharged.



Functions of the female reproductive organ

1.Ovary:Produces ova (eggs).

2 .Fallopian tube (Oviduct):Stores the ovum for fertilisation.

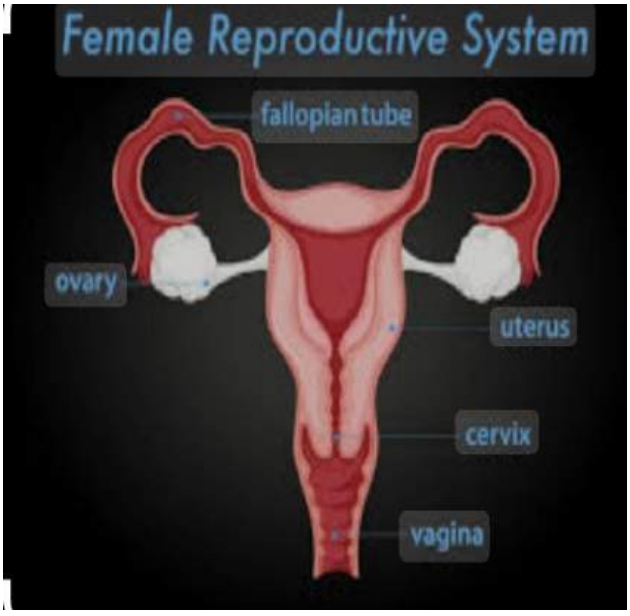
3. Uterus (womb):Houses the fertilised egg for further development.

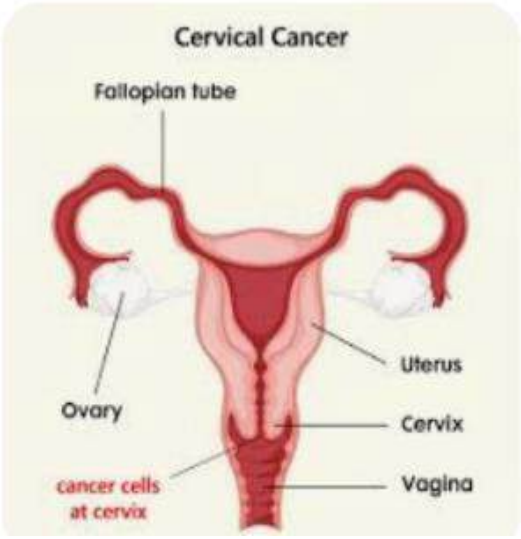
4.Cervix:An opening at the end of the uterus.

5.Vagina:For sexual intercourse. It connects the vulva and

the cervix.

6. Vulva: The opening at the end of the vagina.





MENSTRUATION, OVULATION, FERTILISATION AND CONCEPTION

Menstruation refers to the monthly flow of blood which occurs in girls/ Women as a result of unfertilized eggs (ova) in the fallopian tube.

Menstruation starts between the age of 8-15 in girls. It is what most girls refer to as monthly period.The time between one menstruation and the next is called menstral cycle. It is usually 28-32 days in most women.

Ovulation is the release of egg(s) from the ovary to the fallopian tube.

Once the puberty age is attained in females, the ovaries release egg(s) into the fallopian tube or oviduct in readiness for fertilization once a month .If there is no sperm to fertilize the egg(s), the egg breaks down and together with the linings of uterus, flow out as blood.

Fertilisation

Fertilisation occurs when sperm unites with the egg (ovum) to form the zygote which divides repeatedly to form the foetus.Fertilisation occurs in the fallopian tube or the oviduct.

Conception occurs when a fertilised egg is able to implant or attach itself to the linings of the uterus. The fertilised egg develops to form the foetus and it is delivered as a baby after nine months in human beings.

Menopause: is a stage where women are unable to produce eggs and have stopped menstruation