**BASIC SCIENCE JSS 1**

**THIRD TERM**

**SCHEME OF WORK**

**WEEK TOPIC**

1. ENVIRONMENTAL POLLUTION(I)
2. ENVIRONMENTAL POLLUTION (II)
3. FORCES
4. CALCULATIONS OF GRAVITATIONAL FORCE
5. SPACE TRAVEL
6. GRAVITATION AND WEIGHTLESSNESS

7 – 8. EARTH IN SPACE

1. SATELLITES
2. REVISION

**WEEK ONE**

**ENVIRONMENTAL POLLUTION (I)**

Pollution occurs when pollutants contaminate the natural surroundings; which brings about changes that affect our normal lifestyles adversely. “Pollution is the introduction of contaminants into the environment that cause harm or discomfort to humans or other living organisms, or that damage the environment” which can come “in the form of chemical substances, or energy such as noise, heat or light”.

**Types of pollution**

* Water Pollution
* Air Pollution
* Soil Pollution

**WATER POLLUTION**

“Water Pollution” is the type of pollution that involves the contamination of various water bodies. Various aquatic creatures depend on these water bodies and its natural nutritious features to support its life. Water pollutants include insecticides and herbicides, food processing waste, pollutants from livestock operations, volatile organic compounds (VOCs), heavy metals, chemical waste and others.

**EVALUATION**

1. What is pollution?
2. Mention three types of pollution.

**CAUSES OF WATER POLLUTION**

**Industrial waste** gets dumped into these water bodies. This causes a chemical imbalance in the water leading to death of the aquatic beings.

**Insecticides, pesticides and ripening chemicals** that are used on plants run into the ground water system or nearby streams.

**Washing clothes near lakes and rivers** causes detergents also causes a condition called “Eutrophication” which blocks sunlight from entering inside and reduces oxygen values in the water causing an inhabitable environment.

**‘Oil Spills’** are caused when giant oil tankers and oil rigs which are present in the oceans are damaged by either natural or human errors cause a long-time damage to the ocean as oil is lighter than water and floats on water forming a layer blocking sunlight.

Certain natural disasters like flash floods and hurricanes cause the intermixing of water with harmful substances on the land.

**PREVENTIVE MEASURES**

People can take certain preventable measures to stop water pollution like being more cautious of dumping contaminants onto the water. For the repair of the damage that has already been done, water treatment plants are being constructed with innovative techniques to clean the polluted water. But as always a certain part of the damage can be resolved therefore, it is better to prevent water pollution as water is basic need for the survival of man.

**EVALUATION**

1. State three causes of water pollution.
2. How can water pollution be controlled?

**AIR POLLUTION**

The contamination of the air present in the atmosphere is known as “Air pollution”. Respiration is an important life process of all living things. We breathe in the air present in the atmosphere. Therefore if the air around us is contaminated with poisonous gases, it would have a fatal effect on us. Some of the most notable air pollutants are sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, volatile organic compounds (VOCs) and airborne particles.

**CONSTITUENTS OF AIR**

The air naturally comprises of 78% of nitrogen, 21% of oxygen, 0.9% of oxide gases and 0.1% of inert gases. When this balance is disturbed, it causes disruptions of severe proportions

**WHAT CAUSES AIR POLLUTION?**

* Partially combusted exhaust gases released from internal combustion engines add poisonous gases into the atmosphere.
* Certain industries release some gases like sulphur dioxide and carbon monoxide which mix with the air and clouds and cause acid rains.
* Burning of discarded plastic, wood and rubber also release carcinogenic gases into the atmosphere.

**CONTROL MEASURE**

Air pollution is very much fatal to living things as almost all living beings respire directly from the atmosphere without undergoing any treatment like water. Hence use of catalytic converters in vehicles, preventing the burning of used products, leaving vehicles running for lengthy periods of time during halts and such environment friendly actions.

**EVALUATION**

1. Define air pollution.
2. Mention four causes of air pollution.

**SOIL POLLUTION**

Stripping soil of its natural fertility by using artificial chemicals like pesticides, insecticides, ripening agents etc. is known as “Soil Pollution”. Plants depend on the nitrogenous compounds present in the soil for their nutrition. Use of insecticides, pesticides and other artificial chemicals absorbs the nitrogen from the soil making it unfit for the growth for plants. Plants are responsible for holding the soil together firmly so, when the plants can’t grow the soil splits, leading to soil erosion. Some soil pollutants are: hydrocarbons, solvents and heavy metals.

**GENERAL EVALUATION**

1. Define air pollution.
2. Mention four causes of air pollution.
3. State three causes of water pollution.
4. How can water pollution be controlled.
5. Mention the types of pollution.

**WEEKEND ASSIGNMENT**

1. Stripping soil of its natural fertility by using artificial chemicals like pesticides, insecticides, ripening agents etc. is known as A. Soil Pollution B. land pollution

C. thermal pollution D. water pollution.

1. Plants are responsible for holding the soil together firmly so, when the plants can’t grow the soil splits, leading to \_\_\_\_ A. soil erosion B. sedimentation C. soil split

D. none.

1. VOCs means \_\_\_\_ A. volatile organic compounds B. voice of country C. voicing of centralized D. none.
2. Washing clothes near lakes and rivers causes detergents and also causes a condition called A. Eutrophication B. hydrocarbons C. disruptions of severe proportions D. Oil Spills.
3. \_\_\_\_ occurs when pollutants contaminate the natural surroundings; which brings about changes that affect our normal lifestyles adversely. A. Pollution B. pollutants

C. farts D. osmosis.

**THEORY**

1. State three causes of water pollution.
2. List five types of pollutants.

**WEEK TWO**

**ENVIRONMENTAL POLLUTION (II)**

**EFFECTS OF POLLUTION**

1. **Environment Degradation**: Environment is the first casualty for increase in pollution weather in air or water. The increase in the amount of CO2 in the atmosphere leads to smog which can restrict sunlight from reaching the earth. Thus, preventing plants in the process of photosynthesis. Gases like Sulfur dioxide and nitrogen oxide can cause acid rain. Water pollution in terms of Oil spill may lead to death of several wildlife species.
2. **Human Health**: The decrease in quality of air leads to several respiratory problems including asthma or lung cancer. Chest pain, congestion, throat inflammation, cardiovascular disease, respiratory disease are some of diseases  that can be causes by air pollution. Water pollution occurs due to contamination of water and may pose skin related problems including skin irritations and rashes. Similarly, Noise pollution leads to hearing loss, stress and sleep disturbance.
3. **Global Warming**:  The emission of greenhouse gases particularly CO2 is leading to global warming. Every other day new industries are being set up, new vehicles come on roads and trees are cut to make way for new homes. All of them, in direct or indirect way lead to increase in CO2 in the environment. The increase in CO2 leads to melting of polar ice caps which increases the sea level and pose danger for the people living near coastal areas.
4. **Ozone Layer Depletion:** Ozone layer is the thin shield high up in the sky that stops ultra violet rays from reaching the earth. As a result of human activities, chemicals, such as chlorofluorocarbons (CFCs), were released into the atmosphere which contributed to the depletion of ozone layer.
5. **Infertile Land**: Due to constant use of insecticides and pesticides, the soil may become infertile. Plants may not be able to grow properly. Various forms of chemicals produced from industrial waste is released into the flowing water which also affects the quality of soil.

Pollution not only affect humans by destroying their respiratory, cardiovascular and neurological systems; it also affects the nature, plants, fruits, vegetables, rivers, ponds, forests, animals, etc, on which they are highly dependent for survival. It is crucial to control pollution as the nature, wildlife and human life are precious gifts to the mankind.

**EVALUATION**

1. State five effect of pollution.
2. What are the effect of pollution on humans?

**OTHER EFFECTS ARE:**

1. **Industries**: Industries have been polluting our environment especially since the beginning of the industrial revolution, as mentioned above, notably due to the increasing use of fossil fuels. In the 19th century and for a significant part of the 20th century, coal has been use to make machines work faster, replacing human force. Though pollution by industries mainly causes air pollution, soil and water contamination can also occur. This is particularly the case for power-generating industries, such as plants producing electricity.
2. **Transportation**: Ever since men abandoned animal power to travel, pollution of the environment has become higher and higher. Its levels have only been increasing until now. Similarly to industries, pollution caused by transport can mainly be attributed to fossil fuels. Indeed, humans went from horse carriages to cars, trains (which, before electricity, used to be propelled by coal), and airplanes. As the traffic is increasing every day, pollution follows that evolution.
3. **Agricultural Activities**: Agriculture is mainly responsible for the contamination of water and soil. This is caused by the increased use of pesticides, as well as by the intensive character of its production. Almost all pesticides are made from chemical substances and are meant to keep diseases and threatening animals away from the crops. However, by keeping these forms of life away, harm is almost always made to the surrounding environment as well.
4. **Trading Activities**: Trading activities including the production and exchange of goods and services. Concerning goods, pollution can be caused by packaging (which often involves the use of plastic, which is made from fossil fuels) or transport, mainly.
5. **Residences**: Finally, residential areas provide their fair share of pollution as well. First, to be able to build homes, natural environment has to be destroyed in one way or another. Wildlife and plants are driven away and replaced by human constructions. As it requires the work of industries, construction itself is also a source of contamination of the environment. Then, when people settle in, they will produce waste every day, including a part that cannot be processed by the environment without harm yet.
6. **Effects on Humans**: The effects of environmental pollution on humans are mainly physical, but can also turn into neuro-affections in the long term. The best-known troubles to us are respiratory, in the form of allergies, asthma, irritation of the eyes and nasal passages, or other forms of respiratory infections. Notably, these well spread affections can be observed when air pollution is high in cities, when the weather gets hot, for instance. On top of that, environmental pollution has been proven to be a major factor in the development of cancer. This can happen for example when we eat reminiscences of pollutants used in the production of processed foods, or pesticides from the crops. Other, rarer, diseases include hepatitis, typhoid affections, diarrhea and hormonal disruptions.
7. **Effects on Animals**: Environmental pollution mainly affects animal by causing harm to their living environment, making it toxic for them to live in. Acid rains can change the composition of rivers and seas, making them toxic for fishes, an important quantity of ozone in the lower parts of the atmosphere can cause lung problems to all animals. Nitrogen and phosphates in water will cause overgrowth of toxic algae, preventing other forms of life to follow their normal course. Eventually, soil pollution will cause harm and sometimes even the destruction of microorganisms, which can have the dramatic effect of killing the first layers of the primary food chain.
8. **Effects on Plants**: As for animals, plants, and especially trees, can be destroyed by acid rains (and this will also have a negative effect on animals as well, as their natural environment will be modified), ozone in the lower atmosphere block the plant respiration, and harmful pollutants can be absorbed from the water or soil.
9. **Effects on the Ecosystem**: In short, environmental pollution, almost exclusively created by human activities, has a negative effect on the ecosystem, destroying crucial layers of it and causing an even more negative effect on the upper layers.

**EVALUATION**

1. Mention five other effects of pollution.
2. What is the effect of transportation on pollution?

**POLLUTION CONTROL**

Air pollution control

Methods of air pollution control can be divided into two categories: the control of particulate (pronounced par-TIK-you-let) emissions and the control of gaseous emissions. The term particulate refers to tiny particles of matter such as smoke, soot, and dust that are released during industrial, agricultural, or other activities. Gaseous emissions are industrial products such as sulfur dioxide, carbon monoxide, and oxides of nitrogen also released during various manufacturing operations.

1. **Particulate control**. Methods for particulate control tend to operate on a common principle. The solid particles are separated from the gases in which they are contained by physical procedures such as passage through a settling chamber. A settling chamber is a long, wide pipe through which gases from a manufacturing process are allowed to flow. As these gases slow down in the pipe, the solid particles settle out. They can then be removed from the bottom of the pipe.
2. **A cyclone collector** is another device for removing particulates from stack gases. The gases are fed into a rotating cylindrical container. Equipment for the complete recovery and control of acid and oxide emissions.
3. **Centrifugal forces** (the forces that move things away from the center of rotation) send solid particles in the gas outward against the walls of the container. They collect there briefly, then fall to the bottom of the container. Gases from which the particles have been removed then escape from the top of the container.
4. **Gaseous emissions**. Many different methods are available for removing unwanted gases, most of which are acidic. **Scrubbers** are smokestack devices that contain a moist chemical such as lime, magnesium oxide, or sodium hydroxide. When gases escape from a factory and pass through a scrubber, they react with the moist chemical and are neutralized. From time to time, the scrubbers are removed from the smokestack, cleaned, and replaced.
5. **Another method for controlling gaseous emissions is by adsorption**. Activated charcoal is charcoal that has been ground into a very fine powder. In this form, charcoal has the ability to adsorb, or adhere to, other chemicals. When unwanted gases flow over activated charcoal on the inside of a smokestack, they are adsorbed on the charcoal. As with scrubbers, the charcoal is removed from time to time, and a new lining of charcoal is installed in the smokestack.

**Water pollution**

Methods of controlling water pollution fall into three general categories: physical, chemical, and biological. For example, one form of water pollution consists of suspended solids such as fine dirt and dead organisms. These materials can be removed from water by simply allowing the water to sit quietly for a period of time, thereby allowing the pollutants to settle out, or by passing the water through a filter. (The solid pollutants are then trapped in the filter.)

Chemical reactions can be used to remove pollutants from water. For example, the addition of alum (potassium aluminum sulfate) and lime (calcium hydroxide) to water results in the formation of a thick, sticky precipitate. When the precipitate begins to settle out, it traps and carries with it solid particles, dead bacteria, and other components of polluted water.

**Solid pollutants**

Solid pollutants consist of garbage, sewage sludge, paper, plastics, and many other forms of waste materials. One method of dealing with solid pollutants is simply to bury them in dumps or landfills. Another approach is to compost them, a process in which microorganisms turn certain types of pollutants into useful fertilizers. Finally, solid pollutants can also be incinerated (burned).

**Taking on pollution: a global attempt**

While artificial chemicals have improved the quality of life around the world, they have also posed a threat to the health of people and wildlife. In late 2000, in an effort to control the effect of toxic global pollutants, the United Nations Environment Program organized a meeting to draft a treaty to restrict the production and use of twelve persistent organic pollutants (POPs), especially those used as pesticides. The twelve toxic chemicals cited, which environmentalists have called the "dirty dozen," include eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, and toxaphene), two types of industrial chemicals (hexachlorobenzene and polychlorinated biphenyls or PCBs), and two types of industrial byproducts (dioxins and furans). These toxic pollutants were chosen not because they are the most dangerous, but because they are the most widely studied. Since it is still widely used in Africa to control malaria, DDT was given a special exemption: it can be used in those countries until replacement chemicals or strategies can be developed and put into place. One hundred and twenty-two nations (including the United States) agreed to the treaty. Before it can take effect, however, at least fifty of those nations must also ratify it.

**EVALUATION**

1. Mention five ways each for controlling pollution.
2. Explain Gaseous emissions as a means of controlling pollution.
3. Mention the examples of pollutants you know.

**Possible future approach to cleaning up pollution**

The cost of cleaning up tens of thousands of toxic sites on factory grounds, farms, and military installations is staggering. In the United States, that amount may soon exceed $700 billion. So far, the main approach has been to dig the polluting chemicals out of the ground and transport them to a landfill. However, after a decade of research, scientists in the early twenty-first century found that hundreds of species of plants, along with the fungi and bacteria that inhabit the ecosystem around their roots, seek out and often break down chemical molecules that can harm most other life. For example, there are sunflowers that capture uranium, ferns that thrive on arsenic, clovers that eat oil, and poplar trees that destroy dry-cleaning solvents. Research into using plants as pollution sponges must continue, but early reports of their helping to clean up pollution were promising.

**GENERAL EVALUATION**

1. Mention five ways each for controlling pollution.
2. Explain Gaseous emissions as a means of controlling pollution.
3. Mention the examples of pollutants you know.
4. Mention five other effects of pollution.
5. What is the effect of transportation on pollution?

**WEEKEND ASSSIGNMENT**

1. The increase in the amount of CO2 in the atmosphere leads to \_\_\_ which can restrict sunlight from reaching the earth. A. smog B. fog C. aerosol D. pollution.
2. The two types of industrial byproducts are \_\_\_ A. dioxins and furans B. methane and ethane C. toxins in dole D. hexachlorobenzene and polychlorinated biphenyls.
3. One method of dealing with solid pollutants is simply to \_\_\_ them in dumps or

landfills. A. bury B. sagitate C. plant D. discard.

1. \_\_\_ reactions can be used to remove pollutants from water. A. Chemical B. Physical C. Frontal D. Plane.
2. Methods of air pollution control can be divided into \_\_ categories. A. 2 B. 3 C. 4 D. 5.

**THEORY**

1. Mention the examples of pollutants you know.
2. Mention five other effects of pollution.

**WEEK THREE**

**FORCES**

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.

**TYPES OF FORCE**

There are two types of force namely:

1. Contact force

2. Non-contact

**CONTACT FORCE**

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.

**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. Example include: Gravitational force, Electric force, Magnetic force

**MAGNETIC AND GRAVITATIONAL FORCES**

In a bar magnetic, there is North pole end south pole end, the like poles repel each other while unlike poles attract each other. Two magnets can attract each other when they were still some distance apart. Also magnet can attract iron fillings before the magnet came in contact with the iron fillings. These magnets came in contact with the iron fillings. This phenomenon shows that magnetic force act over an area around the magnet. Thus a magnetic force is called a **field force** which acts over an area.

**GRAVITATIONAL FORCES**

The force by 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.

The light objects like feathers, children balloon which do not fall immediately to the earth are supported by air, but they eventually fall to the earth.

**EVALUATION**

1. Explain the magnetic force.

2. What do you understand by gravitational force ?

**GENERAL EVALUATION**

1. Explain the magnetic force.
2. What do you understand by gravitational force?
3. Distinguish between contact force and force of gravity
4. How would you demonstrate a magnetic force?
5. Name two contact and two non-contact forces.

**WEEKEND ASSIGNMENT**

1. 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

2. Which of the following is not a type of force? A. electrical B. contact C. magnetic D. reversible

3. When a canoe – man paddles backwards in the water, the canoe moves forward this shows that A. forces occur in pair B. contact force is acting C. a force is not involved D. water is pushing the canoe.

4. The gravitational force can be found A. on the earth B. in the moon C. around the planets D. in the galaxy

5. The magnetic force is also known as \_\_\_ A. pulse B. electrical C. field force

D. gravitational force

**THEORY**

1. Distinguish between contact force and force of gravity.

2. How would you demonstrate a magnetic force?

3. Name two contact and two non-contact forces.

**WEEK FOUR**

**CALCULATION OF GRAVITATIONAL FORCES**

**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 152) joule is the unit of work.

**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 on balanced. The sum of such forces is not zero. Such forces are either acting in different 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.

**UNIT OF FORCE**

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 a arrow, or depending on the direction.

**EVALUATION**

1. Explain balanced and unbalanced forces.

2. State the S.I unit of force.

**FRICTIONAL FORCE**

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

**ADVANTAGES OF FRICTION/USES**

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 OF FRICTION**

1. It causes wear and tear of machine parts.

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.

**EVALUATION**

1. Explain balanced and unbalanced forces.

2. State the S.I unit of force.

**GENERAL EVALUATION**

1. Explain balanced and unbalanced forces.

2. State the S.I unit of force.

3. Define force b. State the two types of force.

4. State three advantages and three disadvantages of friction.

**WEEKEND ASSIGNMENT**

1. One of the following force is non-contact force A. electric force B. push C. tension

D. none.

2. Which of the following forces requires contact for its action A. gravitational force B. frictional force C. magnetic forces D. all.

3. The sum of unbalanced forces is A. zero B. greater than zero C. less than zero D. 1.

4. All of the following are correct except one A. forces causes motion B. forces cause change in the direction of motion C. forces cause weightlessness D. none of the above.

5. The S.I unit of force is A. Kg B. N/m3 C. N D. Nm.

**THEORY**

1 (a) Define force (b) State the two types of force.

2. State three advantages and three disadvantages of friction.

**WEEK FIVE**

**SPACE TRAVEL**

**MEANING OF SPACE TRAVEL**

The space outside the sun, earth, star is called outer space. Space travel is the travelling to the outer space beyond this earth. The space travellers are called **astronau**t. The earth is surrounded by a layer of air called **atmosphere** which can be divided into about 4 regions:

* + Troposphere
  + Stratosphere
  + Lomosphere
  + Exosphere

Since 1957, man has been travelling to the space to find out what happens there.

The meaning of space travel is, going to the moon or planets or orbiting the earth in a special craft called **spaceship**.

Spaceship is moved by rockets. After leaving the earths 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 the body throughout in space**. They also carry dry foods and oxygen masks.

**EVALUATION**

1. State the four divisions of atmosphere

2. (a) Who are astronauts? (b) Why do astronauts wear suits?

**PURPOSE OF SPACE TRAVEL**

1. It helps to watch everything that is happening in the world on the television e.g. football game, basket ball 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 all over the world e.g. using of telephone.

**EVALUATION**

1. Give four purpose of space travel.

2. How are scientists the main people behind space travel?

**BENEFITS AND DANGERS OF SPACE TRAVEL, 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 spacecrafts e.g. rocket

6. Production of rocket or aircraft fuels.

**EVALUATION**

1. What are the main benefits of space travel?

2. List four other benefits of space travel.

**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 time

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

**The problems of space travel include some of these**

**HIGH SPEED**

Astronauts have to be trained in order to adopt to the high speed of space travel

**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

**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.

**BASIC NEED OF LIFE**

Water, oxygen, food etc must be made available in spaceship.

**ESCAPE VELOCITY**

Rockets require escape velocity to escape from the attraction of the earth or the force of gravity.

**EVALUATION**

1. State five dangers of space travel.

2. What are the problems of space travel ?

**GENERAL EVALUATION**

1. State the four divisions of atmosphere.
2. Who are astronauts?
3. Why do astronauts wear suits?
4. State five dangers of space travel.
5. What are the problems of space travel?

**WEEKEND ASSIGNMENT**

1. Space suit is used by \_\_\_\_ A. carpenters B. chemist C. astronauts D. doctors.

2. The following are the various division of atmosphere except A. lithosphere

B. troposphere C. lomosphere D. exosphere.

3. Which of the following is associated with space travel A. Basic need of life B. tarred road C. electricity D. standard laboratory.

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. The force of gravity is not felt in \_\_\_\_ A. space B. earth C. moon D. sun.

**THEORY**

1. Explain the space travel.

2. a. State three purposes of space travel.

b. Describe the problem of space travel.

c. Which do you consider the greatest benefits of space travel ?

**WEEK SIX**

**GRAVITATION AND WEIGHTLESSNESS**

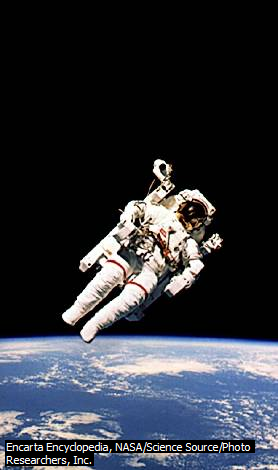
**MEANING OF GRAVITATION**

**Gravitation** is a force that has effect on the stability of a body. If an object is tossed up the air, it will fall 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 pull because it has a great mass. The gravitation pull of the earth is always directed to the centre.

**WEIGHTLESSNESS**

Weightlessness is a feeling of being weightless. It does not mean having no weight. As someone move away from the surface, it 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.



**EVALUATION**

1. What is gravitation?

2. Define the term weightlessness.

**EFFECT OF GRAVITATION ON OBJECTS**

1. **Stability on Earth**: Gravitation help 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:** 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.

**EVALUATION**

1. Define gravitational pull.
2. State four effects of the gravitational pull.

**GENERAL EVALUATION**

1. What is gravitation?

2. Define weightlessness.

3. Define gravitational pull.

4. State four effects of the gravitational pull.

5. Describe the effect of gravitation on stone, a feather and a book.

**WEEKEND ASSIGNMENT**

1. 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.
2. Gravitational force is a force of \_\_\_\_ A. separation B. attraction C. friction

D. opposition.

1. 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.
2. The earth’s gravitational pull on an object is represented by that object’s A. weight

B. size C. volume D. materials.

1. 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.

**THEORY**

1. Describe the effect of gravitation on stone, a feather and a book.

2. Where does object become weightless and why?

**WEEK SEVEN AND EIGHT**

**THE EARTH IN SPACE**

Man has been inquisitive about the sky, the moon and the stars for a very long time. Now, a lot has been known about the component of the universe and other celestial bodies.

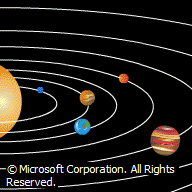
**THE SOLAR SYSTEM**

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 **METEROIDS**.

**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 kilometres.



**THE NINE PLANETS**

**EVALUATION**

1. Give the names of the biggest and the smallest planet.
2. State the nine planets with their distance from their sun.
3. Identify two examples of other bodies found in the solar system.

**ROTATION AND REVOLUTION OF THE EARTH AND MOON**

**THE EARTH**

The earth is the third planet from the sun and it is the only known planet in the universe that harbours 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.

**EVALUATION**

1. What do you know about the sun and the moon?
2. State the effects of the sun on the earth

**DESCRIPTION OF ECLIPSE, CLIMATE, AND SEASONS**

Eclipse of the sun; *This occurs when the moon moves between the sun and the earth and all are exactly in a straight line.*

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.

**EVALUATION**

1. What is eclipse?
2. Discuss eclipse of the sun and of the moon.

**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 shinning 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.*

**DAY AND NIGHT**

The sun supplies the earth warmth and light. The earth is spherical in shape. *When the earth rotates about its axis round the sun, part of its surface is expose to sunlight while the rest remain in darkness. The part exposed to sunlight experiences* ***DAY*** *while the part in the darkness experiences* ***NIGHTS****.*

**EVALUATION**

1. What is climate?
2. Explain how revolution of the earth caused seasons.

**GENERAL EVALUATION**

1. Give the names of the biggest and the smallest planet
2. State the nine planets with their distance from their sun
3. Identify two examples of other bodies found in the solar system
4. What is climate?
5. Explain how revolution of the earth caused seasons.

**WEEKEND ASSIGNMENT**

1. The sixth planet from the sun is \_\_\_ A. Pluto B. Uranus C. Saturn D. Jupiter.
2. The science of moving planetary bodies is \_\_\_ A. astronaut B. stargazine

C. geography D. geology.

1. The revolution of the earth round the sun causes \_\_\_ A. days B. night C. seasons

D. noon.

1. The sun and all the bodies orbiting round it makes up the A. solar system B. galaxy

C. meteoroids D. comets.

1. Other bodies in the solar system include the following except \_\_\_ A. asteroid

B. comets C. water D. meteoroids.

**THEORY**

1. Write briefly on eclipse of the sun and moon.
2. Explain how revolution of the earth caused seasons.
3. Briefly discuss the sun, the earth and the moon.

**WEEK NINE**

**SATELLITE**

**MEAINING OF STATELLITE**

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

**NATURAL AND ARTIFICIAL SATELLITES**

The moons that orbit the planets in solar system are natural satellite while artificial satellite are man 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

**EVALUATION**

1. Give the meaning of satellite and name two planets with their number of satellites

2. State four examples of countries, year of first launch and the name of satellites launched by them.

**TYPES OF SATELLITE AND THEIR USES**

1. **ASTRONOMICAL SATELLITES**: They are used for observation of distance plants, galaxies and other outer space objects.

2. **BIO SATELLITE:**These are used to carry living organism especially for scientific experimentation.

3. **OBSERVATION SATELLITE:** They are used for geographical studies, photographing of areas, map marking.

1. **WEATHER SATELLITES:** These are used to monitor the weather conditions in the atmosphere and supply the information to ground stations.

5. **COMMUNICATION SATELLITE:**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, mouths or years.

8. **NAVIGATIONAL SATELLITES:** These used radio time signals, it enables mobile receivers on the ground to determine their exact location.

**EVALUATION**

1. What is reconnaissance satellite?

2. Give four examples of satellite and their uses.

**GENERAL EVALUATION**

1. Give the meaning of satellite and name two planets with their number of satellites.

2. State four examples of countries, year of first launch and the name of satellites launched by them.

3. What is reconnaissance satellite?

4. Give four examples of satellite and their uses.

5. Explain the term satellite and distinguish between natural and artificial satellites.

**WEEKEND ASSIGNMENT**

1. \_\_\_\_\_\_\_ is a body that moves round the planet A. Earth B. Sun C. Satellite D. Stars.

2. One of the following has the highest number of satellite in the solar system

A. earth B. Saturn C. venues D. Jupiter.

3. The following are examples of planet except \_\_\_\_ A. moon B. earth C. mass

D. Jupiter.

4. \_\_\_ are used for monitoring the dry and wet season of a particular area

A. Astronomical satellite B. Weather satellite C. Bio satellites D. Communication satellite.

5. Sputnik 1 was launched in 1957 by USSR while SAT 1 was launched in \_\_\_ by \_\_\_ A. 1970, Japan B. 1958, USA C. 2003, Nigeria D. 1988. Israel.

**THEORY**

1. Explain the term satellite and distinguish between natural and artificial satellites.

2. Explain how artificial satellites have improved whole world.