**Name in full**

**Peter Mabior Kiir Kudior**

**ID number**

**UB70219SHE79368**

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**Questions to Answer:**

**Lesson 1**

1. How is pollution defined?

* This is an introduction to contaminant into the natural environment that adverse change e.g human waste and animal waste.

2. What are the 6 sources of pollution?

* Biodegradable waste consists mainly animal and human waste
* Heat as a source of pollution in water
* Plants nutrient such as phosphate and nitrates
* Sediment is one of the most common source of water pollution
* Hazardous and toxic chemicals these are usually man-made material that are not used or disposed of properly
* Radioactive pollutants include waste water discharges from factories hospitals and uranium mines, some of them come from radon.

**Lesson 2**

3. What is an Environmental Management System (EMS)?

* This is the system approach for incorporating energy and environmental goals and priorities such as energy use and regulatory into routine operations.

4. Describe 6 of the 17 ISO 14001 Elements.

* Environmental policy it is always drive the commitment of the municipality to maintain and potential, this where documentation is made together with policies.
* Environment aspect: these are the municipal activities that have potential to interact to the to the environment in the ways that it can post risks and how to manage it.
* Legal and other requirement: this are requirement needed for the municipality and legal officers to act for the compliance of the of th3e continue basis.
* Objectives and target: they are indicators that form goals of a municipality environment management system, which are drawn on the information that aligned main objective of development.
* Environmental management programs: these are activities that define the methods municipality used to achieved its objectives and target.
* Structure and responsibilities: this is an organizational chart that defined, the organogram, role and responsibility of the individual.

**Lesson 3**

5. Describe the “Four types of processes” that affect air pollution levels.

* Emission: These are chemical emitted from atmosphere by the range of source. E.g Anthropogenic emission come from human activities such as burning from fossil fuel.
* Chemistry: These are atmospheric chemical reaction in the atmosphere create, modify and destroy chemical pollutant
* Transport: Wind can carry pollutant from their sources, so that emission in one region cause environmental impact far away.
* Deposition: This a material in the atmosphere return to earth either because they are directly absorbed or taken up by reaction of chemical such as photosynthesis.

6. What are the four “Primary Air Pollutants”?

* Sulfur dioxide (SO2)
* Nitrogen Oxide (NO2)
* Carbon Monoxide (CO)
* Volatile Organic Compound (VOCs)
* Heavy Metal in water e.g cranium

7. What is smog?

* This is generic term that is use for any kind of air pollution that reduce visibility of urban areas which are consider into two industrial and photochemical smogs.

**Lesson 4**

8. How is the Ozone layer around the earth affected by pollution?

It makes the planet inhabitable by absorbing solar ultraviolet radiation before its reach the planet’s surfaces. UV radiation damage cell and caused sunburn and premature aging in low doses. Which can lead into skin cancer.

9. What are Greenhouse gases?

1. The major greenhouse gases are methane and tropospheric ozone which are the main concern of air quality.

How do they cause Climate Change?

* It always absorbed light by carbon aerosol particle which has the significant warming effect, then combining three agents can cause radioactive force which is more than CO2 while reduction in the air pollutants would reap a considerable benefit to climate change.

**Lesson 5**

10. Describe completely the “Water Environment” and “The Hydrologic Cycle”.

* ‘**’Water Environment”** When the water environment begins there should be single water of rain fall to the earth, this raindrop joints with others like it to form a tiny trickle. These trickles combine and run off the land to create rivulets, creeks, streams and rivers. Therefore, when the small streams and mighty rivers of the world unit they produce the vast oceans and sea that surround us.
* **“The Hydrologic Cycle”** this process begins with movement of water from the ocean to the land and back to the ocean again continuously. It begins with water as water moves from the ocean’s surface into the air above through evaporation, therefore during evaporation, only the fresh water vapor and other volatile compound enter the atmosphere. Minerals, salts and other impurities are left behind in the ocean. The buildup of these minerals and salts overtime has made the ocean salty.

11. Describe 4 examples of how “Human Activates” affect water quality.

* Rivers and streams: human being used to transport themselves from the mountain top to the sea for centuries. Therefore, human being also used it for transporting their waste that can affect the water quality.
* Lakes and ponds: during the time of ancestors who like to settle at the shore of lake and pond they could dispose their waste directly to the lake and that affect the quality of water directly.
* Wetland: these are always rich area with nutrients, vegetable and diverse population of plants and animal. The filters out pollutants as water moves from upland to the open water bodies and this can affect the quality of water.
* Oceans and seas: they are forever changing because their characteristic continue changing to the worse because of human activities their natures and these affect the quality of water.

**Lesson 6**

12. Describe 3 of the most common sources of water pollution.

* Storm water runoff: when the rain falls along the roads, parking lots, farm field it can either soak or run off the surface, these are part of water pollutant e.g water from parking lot may contain gasoline.
* Septic system: this is always a large tank for burial that carried 1000 liters, solid sewage is retained in the tanks therefore liquid waste effluent enter and percolates the underlying, when the sewage spilled in the water they caused water pollution which is very dangerous.
* Sewage treatment plants: in some countries where there is plant for sewages, municipalities, cities and town design it as a mean of maintaining hygiene, the pipes are connected under the ground with an intention that it’s the safe mean of managing the waste of which it’s only 85% accurate. even though sewage treatment plant is intended to prevent water pollution they can also contribute to number of ways e.g the solid and organic materials are not remove through the conventional process.

**Lesson 7**

13. What are “Heavy Metals”? What are the hazards of “Heavy Metals”?

What are “Heavy Metals? these are those common metal with density of more than 5g/cm3

What are the hazards of “Heavy Metals”?

* Cadmium-Occurrence, exposure and dose.
* Arsenic
* Lead

14. What are the sources of Cadmium pollution? What is the hazard of Cadmium?

* Cadmium-Occurrence, exposure and dose. Industrial emission, application of fertilizers, sewages sludge to the farm land, therefore all this increase to soil contamination of soil and cadmium increase uptake.
* What is the hazard of Cadmium? They led to mercury emission, lead emission and health effect such as skin, lung cancers.

15. What the sources of pollution from Mercury, Lead and Arsenic?

* These all lead to air, water, soil and smelting activities being the only source of anthropogenic source of pollution.

**Lesson 8**

16. How do chemical pollutants in the environment cause cancer through DNA?

* The chemical reaction in the cigarette that is smoke can cause a cancer through Gene- gene which occur when pollutant within the environment does not change DNA sequence but rather cause chain reaction that affect the function of one gene and dysfunction some of the vital organ.

17. What are the sources and hazards of Aflatoxins?

* These is referring to eating of some product such as contaminated product such as peanut or by consuming the contaminated product of animal that ate contaminated feed.

**Lesson 9**

18. Describe how the processing of food contributes to pollution. What methods are used to remove the pollution from the environment?

Describe how the processing of food contributes to pollution: - the resource in the food industries are water, raw material and energy. Since long time ago the food food-processing has been a large water user always water is used as an ingredient and initial intermediate cleaning source an efficient transportation conveyor of raw material and transportation. Therefore, the key issues for environmental pollution surrounding solid waste and waste water.

What methods are used to remove the pollution from the environment: -

* Ground water pump and treatments:- this method involves extracting water with vacuum pump and then separating a carbon contaminant with adsorption, air stripping and biological treatement.
* Waste water treatment: - this method removed contaminates from waste water with physical techniques such as separation, chemical treatment and biological treatment
* Bio-remediation: This method is bio-degradation of contaminants by micro-organism which can be enhance through the addition of nutrients.
* Incineration: This method uses extremely high temperature to destroy contaminant within hazardous waste.
* Thermal desorption: This method is used to burn waste in utilize high temperature to burn the contaminated soil, volatizing and semi-volatile gases like mercury and hydrocarbon which are always burn after burner.
* Removal and disposal: - the method involved the physical removal of contaminated equipment, soil, sludge, water tank and transporting to depositing site for sake it hazardous.

19. Describe 1 “Advanced Wastewater Treatment Practice”.

1. Advanced Wastewater Treatment Practice: - this is always a treatment beyond secondary or biological, they are employed in target of specific treatment discharge of constituent.
2. Membrane application: - this process focus on separating water from contaminant using semi-permeable membrane and applied pressure differential but in a generic terminology they work like transparent glass but they don’t allowed insect to go through it therefore, the pressure is applied to reverse the water from the natural equilibrium between a clean water and wastewater and therefore the process treating the water is achieved successfully.

**Lesson 10**

20. Describe “Waste Management”. How is water being managed globally? How can waste benefit society?

Describe “Waste Management”

* The energy waste is significant renewable energy resource whose energy value can be exploited through thermal process therefore it includes process and action required to manage waste from its inception

**Disposal**

**Transport**

Treatment

Collection

* In the above mention figure this show the total description of what kind of procedures take in waste managing.

How is water being managed globally?

* Fresh water abstraction: - globally water can be abstracted either, from the sea, lake ocean from the rain fall through the aim of treatment and other preliminary procedure.
* Pre-treatment: this is a method deploy globally to minimize the health threat on a population in term of water consumption.
* Distribution: This method is applied globally by department of water and resource to calculate the amount water to the specific population in relationship to sustainable development goal.
* Used: - This procedure helps in guide to all health regulation on how best we can use water in respect to global protocol.
* Post-treatment: - This procedure is always
* Quantify require annual national trend data on waste production and practice this can be easily manage if there’s consistency, complete data management.
* Through following of global IPCC 2006 guideline the help in emission of methane, Carbon, Nitrogen dioxide, wastewater emission from the indigestion in the surface.
* Safe and readily available water is important for the public health, domestic and agricultural irrigation.

How can waste benefit society?

* Healthier ecosystem.
* Reduce harmful waste to useful(recycling).
* Reduction of pollution.
* Economic benefit e.g animal waste are used as a manure.
* Reduce the burden of disease in the society.
* Urban planning and design.
* Encouragement of society to take care and ownership of the environment.
* Water recycling.
* Waste material can be translated into building material.

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