** The purpose of this study guide is to familiarize yourself with the terms you will study in class. This study guide alone will not allow you to pass your exam. You must attend the prep-course. **

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Each study guide is unique and presents the information in clear and condensed form to orient you to the material applicable to the exam. The materials cite various textbooks, journal articles and literature, including some found on websites.

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Instructions:

◉ Read the study guide.

◉ Print and complete the sample test.

◉ Correct your test and review the incorrect items.

◉ Attend class to ensure your money-back guarantee.

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I. Ecological Concepts

A. Ecosystems:
   a. *Ecosystem* is defined as a natural system *consisting of all living and non-living things* that include; plants, animals, soil, water, air, and the sun’s energy. It is the idea that all living and *non-living organisms coexist to build a complex and dynamic “new whole” and to function as an “ecological unit”* where one cannot exist without the other (Vreugdenhil, D., Terborgh, J., Cleef, A., Sinitsyn, M., Boere, G., Archaga, V., and Prins, H., 2003).

B. Global Ecology:
   a. *Global Ecology* is the study of *how all organisms interact and survive in their planetary environment*. This includes the earth’s ecosystems, its land, atmospheres, and oceans. These interactions shape the behavior of the earth’s system, including its responses to future changes (Carnegie Institution for Science, n.d.).

C. Atmospheric Structure:
   a. The atmosphere can be *divided into vertical layers, and each layer is characterized by differences in chemical composition that produce variations in temperature* (Woodrow Wilson Leadership Program in Environmental Science, 1998). The layers include:
      i. **Troposphere**: is *the atmospheric layer closest to the planet* and contains the largest percentage of mass of total atmosphere.
      ii. **Stratosphere**: is the second major layer of air in the atmosphere and is about 10km to 50km above the planet’s surface.
      iii. **Mesosphere**: is approximately 50km to 80km and has a *decreasing concentration of ozone and water vapor* where the temperature is lower than in the troposphere or stratosphere.
iv. **Thermosphere**: is located above the mesosphere, separated by the mesopause with temperature increasing from 1000km to 1500 km.

v. **Exosphere**: is the most distant atmospheric layer. It is a transitional zone between earth’s atmosphere and interplanetary space, extending from 96km to 1000km.

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**D. Roles of Organisms:**

a. There are 3 major roles that organisms assume: (King Middle School, n.d.):

   i. **Producers** are green plants, and they produce *food energy* for themselves and others.

   ii. **Consumers eat food made by the producers.** There are three types of consumers: (1) *herbivores* are animals that eat plants, (2) *carnivores* are animals that eat herbivores and sometimes other carnivores and (3) *omnivores are animals that eat plants and other animals*.

   iii. **Decomposers** are plants and animals that break down dead plants and animals into organic materials that go back into the soil.

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**E. Biodiversity and Stability:**

a. **Biodiversity is the total richness of biological variation.** Biodiversity range from the genetic variation of individual organisms within and among populations of a species, to different species occurring together in ecological communities (Science Encyclopedia, n.d.)

b. **Stability is a measure of resilience and resistance.** To better explain stability, it is how a system is able to return to its original state after it has been disturbed (Global Oneness, n.d.).

c. Diversity-Stability Debate: many famous ecologists suggested that the more diverse communities and their food webs are, the more stable and more resistant they are to invasion by other species. Current consensus is that greater diversity does lead to greater stability (Canadian Biodiversity, n.d.).
F. Energy Flow:

a. *Energy flow is the flow of energy through a food chain.* The ultimate source of energy for most ecosystems is the sun. Energy and the nutrients are passed from organism to organism through the food chain as one organism eats another. Decomposers remove the last energy from the remains of organisms (McShaffrey, D., 2006).

![Diagram of energy flow through a food chain](image)

G. Trophic Levels:

a. *Trophic levels are the feeding position in a food chain such as primary producers, herbivore, primary carnivore, etc.* Green plants form the first trophic level, the producers. Herbivores form the second trophic level while carnivores form the third and even the fourth trophic levels (Biodiversity and Conservation Biology Department (BCBD), n.d.).

H. Food Chains and Food Webs:

a. Food chains are a sequence of organisms that feed upon another in a sequence (BCBD).

b. Food webs are the interconnected sets of many food chains (BCBD).
I. Biogeochemical Cycling:
   a. **Biogeochemical cycling is the changes that a particular element goes through as it passes back and forth through the various earth systems, particularly between living and non-living matter.** Examples include circulation of chemical nutrients such as carbon, oxygen, nitrogen, calcium and water (High Beam Research, 2002).

J. Biomes and Productivity
   a. **Biomes are a large community of plants and animals that occupy a distinct region defined by its climate and dominant vegetation.** Examples of biomes include: grassland, tundra, desert, and tropical rainforest. Productivity is measured by how much biomass (microorganisms, plants, or animals) a particular ecosystem gains over a specified period of time. Water and sunlight are two main factors that make a productive biome.

K. Population Biology:
   a. Study of populations of organisms, especially the regulation of population size, life history traits such as clutch size and extinction (Cosmo Learning, n.d.).

L. Evolution:
   a. **Evolution** is a process in which species of organisms undergo change over a long period of time through genetic variation and natural selection resulting in the development of a new species. Natural selection is the principle that only the organisms best suited to their environment survive long enough to pass on their genetic characteristics to their offspring. The proportion of the species having these characteristics increases with each generation. Natural selection results from random variation of genetic traits in a species and forms the basis of the process of evolution.
M. Succession in Freshwater and Terrestrial Communities

a. **Succession** is when a series of biological communities replace each other over time in a predictable fashion (Marietta College Department of Biology and Environmental Science, n.d.). *It is a gradual process in which ecosystems change and develop over time.* Nothing remains the same and habitats are constantly changing. Succession occurs because through the processes of living, growing and reproducing, organisms interact with and affect the environment within an area, gradually changing it. Succession occurring in freshwater is known as hydrosere. There are **6 stages that occur in hydrosere:**

i. **Migration:** *In the beginning the pond is empty, and there is only open water.* Eventually, insects and beetles may arrive, and their migration brought other creatures such as microscopic plants and animals. Herons and ducks will visit in hope to find food, and they may carry seeds and eggs of animals with them.

ii. **Colonization:** *The seeds that have arrived via being carried or blown by the wind begin to grow and develop.* They will hatch and begin to feed on bacteria, and they will quickly begin to grow and cover the surface, and they will multiply and bloom.

iii. **Establishment:** the species that have colonized the water will slowly improve the conditions.

iv. **Competition:** the number of new species will be slowing down due to the limited amount of free space. The pond is becoming choked with plants, and some colonizers will have disappeared through competition with other colonizers.

v. **Stabilization:** the decline in species through competition results in a stabilized community for those that can survive the swampland.

vi. **Climax:** Now that the community is so stable, change will be impossible. This stage is when the community has reached a steady state. Depending on the water source, the water may remain damp and swamp-like. If the water is isolated from inflow of water, the final...
community could be on dry land. Local conditions will determine the climax community.

II. Environmental Impacts

A. Human Population Growth

a. Human population growth is growing at about 1.5% annually, 89 million people per year. The UN population fund estimates that there will likely be about 9 billion people alive in the year 2050. The number of human beings has increased enormously during the last several millennia especially from 1850-1950 where the population doubled. It is likely that the human population will continue to increase. The recent growth has resulted in damage to the biosphere. More damage is done to the earth to support a person living a highly industrialized lifestyle than to support one living pre-technical-agricultural or a hunter-gatherer lifestyle. Increase in human population has led to deforestation (unsustainable harvesting of potentially renewable sources), rapid mining of non-renewable resources, pollution and other ecological damages (Science Encyclopedia, n.d.).

B. Global Climate and Weather:

b. While weather can change in just a few hours, climate is the average weather in a given place and changes in climate occur over longer time frames. Natural influences can alter how much heat is reflected or absorbed by the Earth’s surface, including changes in the sun’s intensity, volcanic eruptions, and multi-year climate cycles such as El Niño. Human activities such as deforestation and the production of greenhouse gases also affect this balance. These alterations, in turn, affect climate on local, regional, and global scales (Environmental Protection Agency, 2009).

c. Global warming is the rise in temperature that is now underway in the Earth’s atmosphere and oceans. Generally, increases in the Earth’s surface temperature will increase evaporation from the oceans and land, leading to more overall precipitation. However, this additional precipitation will not be
distributed evenly, and shifting storm patterns will likely cause some areas to experience more severe droughts.

Scientists have determined that global warming is caused mostly by human activities that increase concentrations of greenhouse gases in the atmosphere, such as deforestation and burning of fossil fuels. They also suggest that extreme weather events such as storms, floods, and hurricanes will likely also become more intense (Environmental Protection Agency).

C. Greenhouse Effect:

d. The trapping of the sun’s radiation in the Earth’s atmosphere is due to the presence of greenhouse gases. Sunlight penetrates the atmosphere to warm the Earth’s surface, which then radiates heat into the lower level of the atmosphere. Although some of this heat passes out into space, much of it is absorbed by water vapor, carbon dioxide, and other gases in the air. These gases act like the glass roof of a greenhouse, trapping the infrared heat energy and warming the atmosphere.

D. Ozone Layer:

e. A poisonous blue form of oxygen that occurs naturally in large concentrations in the stratosphere. It also occurs in the troposphere where it is the most damaging of the photochemical air pollutants. Stratospheric ozone is crucial to life on the surface of Earth because it absorbs much of the incoming solar ultraviolet radiation and shields the organisms from its damaging effects. Since the mid 80’s, there has been evidence that concentrations of the ozone layer are diminishing as a result of complex photochemical reactions involving chlorofluorocarbons (CFCs) (Science Encyclopedia, n.d.).
E. Pollution:

f. **Anything that corrupts, degrades, or makes something less valuable or desirable can be considered pollution.** Air pollution affects human health by increasing the incidence of asthma, heart disease and other ailments (Science Encyclopedia).

Nitric and sulfuric acid deposited by acid rain can damage forests at high elevations, and alter sensitive agricultural soils. **When acid rain falls on lakes or streams, the resulting acidification can change the water's nutrient balance, kill aquatic organisms and decrease biodiversity.** Acid rain also speeds the decay of building materials and has damaged historic buildings, statues, and sculptures worldwide.

Typical causes of soil pollution include leaking storage tanks, runoff from roadways and other nonporous surfaces, construction, waste disposal, particulate matter and mining. This affects soil by making it lifeless or non-wettable. When large amounts of organic waste contaminate water, microbes use more oxygen to decompose the waste, causing a drop in the oxygen level. **This process of eutrophication happens most dramatically when slow-moving bodies of water receive too much agricultural runoff; the pollutants stimulate the growth of algae, causing an algal bloom that depletes oxygen.** Regular discharges of fuel, sewage, and garbage from ocean-going ships also contribute to ocean pollution. Oil spills from tankers and offshore oil rigs are a major threat to ocean life, affecting everything from phytoplankton, algae, and coral reefs, to wetlands, fish, birds and marine mammals. In addition, huge accumulations of discarded plastic and other persistent debris routinely harm or kill birds, fish and other sea life (Barber, D., n.d.).

The most serious result of pollution is its harmful biological effects on human health and on the food chain of animals, birds, and marine life. **Pollution can destroy vegetation that provides food and shelter.** It can also disrupt the balance of nature and cause death in humans (Integrated Publishing, n.d.).

F. Environmental Risk Assessment (ERA):

9. **ERA is the process of analyzing and evaluating the possibility of adverse ecological effects caused by environmental pollutants.** The risk assessment
Environment and Humanity

process provides a way to develop, organize and present scientific information so that it is relevant to environmental decisions (Environmental Protection Agency, n.d.)

G. Agricultural and Industrial Revolutions:

h. The agricultural and industrial revolution was a period of agricultural development between the 18th century and the end of the 19th century, which saw a massive and rapid increase in agricultural productivity and vast improvements in farm technology (Bellis, M., n.d.). Machinery began to replace manual labor and fossil fuels replaced wind, water, and wood primarily for the manufacture of textiles and the development of iron-making processes. At the dawn of the Industrial Revolution in the mid-1700s, the world’s human population grew about another 57% to 700 million and would see one billion in 1800 (McLamb, E., 2011).

Human population growth is indelibly tied together with increased use of natural and man-made resources, energy, land for growing food and for living, and waste by-products that are disposed to decompose, pollute or be recycled. Naturally, the exponential population growth led to the exponential requirements for resources, energy, food, housing and land as well as the exponential increase in waste by-products (McLamb). Also, the fact that burning coal could replace the need for human labor led to more pollution being emitted into the sky and more natural resources would have to be exploited in the production process. More advanced machines and techniques used for agriculture became available, and these new methods caused the soil to degenerate and increased the amount of land used in farming; ruining animal habitats.
H. Industrial Development of Emerging Nations:

i. In recent decades, a few countries in Latin America, Asia, and Africa, such as Turkey, South Africa, Malaysia, Philippines, Mexico, Costa Rica and El Salvador have experienced substantial industrial growth, fueled by exporting to countries that have bigger economies: the United States, China, India and the European Union. China is one of the fastest growing industrialized countries and releases emissions at a much more rapid rate than any other country. They are burning more fossil fuels and discharge more carbon emissions. With China’s substantial industrialized growth, it is likely that we will see more cars on the road, letting of greater emissions.

As more countries begin to develop, the pollution only gets larger, making it harder to improve the air (Absolute Astronomy, n.d.).

I. Deforestation:

j. The cutting down and removal of all or most of the trees in a forested area is deforestation. The most important ecological consequences of deforestation are depletion of the economically important forest resources, losses of biodiversity through the clearing of tropical forests, and emissions of carbon dioxide with potential effect on global climate through an enhancement of Earth’s greenhouse effect (Science Encyclopedia, n.d.).

J. Desertification:

k. The transformation of land once suitable for agriculture into desert is desertification. Desertification can result from climate change such as extended drought or from human practices such as over-cultivation and poor irrigation practices. Desertified land and deserts are both dry; the barren gullied wastelands left by desertification barely resemble the subtle biological productivity of healthy desert ecosystems (High Beam, 2004.). It is a particularly pressing issue where natural dryness and human poverty coincide.
K. Eutrophication:

I. *Eutrophication is the process of heightened biological productivity in a body of water.* The major factors controlling eutrophication in a body of water are nutrient input and rates of primary production. *Lake Eerie is the most publicized example of excessive eutrophication.* Known as the “dead lake” in the 60’s, Lake Eerie was inundated with nutrient from heavily developed agricultural and urban lands surround it for most of the 20th century. As a result, plant and algae growth choked out most other species living in the lake and left the beaches unusable due to the smell of decaying algae what washed up on the shores (Science Encyclopedia, n.d.).

III. Environmental Management and Conservation

A. Renewable and Non-Renewable Resources

a. *Renewable energy is an energy source that can be easily replenished.* Examples of renewable energy are sunlight, wind, rain, and tides. About 16% of global energy comes from renewable energy. These sources are called non-renewable because they cannot be renewed or regenerated quickly enough to keep pace with their use. Once these resources are depleted, there is no more available for future uses. Fossil fuels: oil, natural gas, and coal are examples of non-renewable resources. Over 85% of the energy used in the world is from non-renewable resources (Brunette, C., 2008).

B. The Green Revolution:

b. *The Green Revolution is often attributed to American Scientist Norman Borlaug.* He began conducting research in Mexico in the 1940’s and developed new disease resistance high-yielding varieties of wheat. By combining Bolaug’s wheat varieties with new mechanized agricultural
technologies, Mexico produced more wheat than what they needed and became an exporter of wheat by the 1960’s. This practice spread worldwide in the ’50’s and 60’s and countries all over the world benefitted from the Green Revolution. India was near mass famine because of its rapidly growing population. Borlaug and others implemented research and developed a new variety of rice that produced more grain per plant when grown with irrigation and fertilizers. India is now one of the world’s leading rice producers (Briney, A., 2010).

C. Agricultural Practices:

c. Agricultural practices determine the level of food production, and to a great extent, the state of the global environment. A doubling in global food demand projected for the next 50 years poses huge challenges for the sustainability both of food production and of terrestrial and aquatic ecosystems and the services they provide to society.

Through the years, agricultural practices led to the loss of soil, increased pollution of watersheds, and the loss of habitat and wildlife diversity. Today, the agricultural community and state leaders are working to find solutions to these problems. Farming methods strive to balance environmental concerns like protecting valuable soil and water with agricultural production and profit (Iowa Association of Naturalists, 1998).

D. Pesticides and Pest Control:

d. Pesticides are a substance or mix of substances used to prevent or destroy pests such as insects, mice, unwanted plants and/or other animals. Pesticides can harm humans, animals or the environment because they are made to kill or adversely affect living organisms. However, they are useful to society because they can kill potential disease-causing organisms, insects, and pests. Pest control devices are any products used to trap, destroy, or repel any pests (Florida Department of Environmental Protection, n.d.).
E. Soil Conservation and Land Use Practices:

e. **Soil conservation is maintaining good soil health and preventing soil erosion.** There’s a growing need to prevent and control soil erosion and soil contamination to maintain soil fertility. This is an important issue in both developing nations where a good portion of income comes from agriculture, and in developed countries where mechanized farming and an overuse of chemical fertilizers can cause damaging effects on the land. (Panse, S., n.d.).

f. Land use activities whether converting natural landscapes for human use or changing management practices on human-dominated lands—have transformed a large proportion of the Earth’s land. By clearing tropical forests, practicing subsistence agriculture, intensifying farmland production, or expanding urban centers, human actions are changing the world’s landscapes in pervasive ways. Although land use practices vary greatly across the world, their ultimate outcome is generally the same: the acquisition of natural resources for immediate human needs, often at the expense of degrading environmental conditions. Many land-use practices are absolutely essential for humanity because they provide critical natural resources and ecosystem services, such as food, fiber, shelter, and fresh-water.

On the other hand, some forms of land use are degrading the ecosystems and services upon which we depend (The World Bank, n.d.).

F. Air Pollution Control:

g. **Pollution control is the process of eliminating the release of pollutants in the environment.** Air pollution control can be split into two categories: the control of particulate emission and the control of gaseous emissions. Physical separation of the particulate from the air using settling chambers, cyclone collectors, impingers, wet scrubbers, electrostatic precipitators and filtration devices, are all the process that are typically used. Gaseous emissions are controlled by similar devices and typically can be used in conjunction with particulate control options. Such devices include scrubbers, absorption systems, condensers, flares, and incinerators (Science Encyclopedia, n.d.).
G. Drinking Water Quality and Supply:

h. Parameters for drinking water quality typically fall under two categories: chemical/physical and microbiological. Chemical/physical parameters include heavy metals, trace organic compounds, total suspended solids, and turbidity (cloudiness/haziness of a fluid). Microbiological parameters include coliform bacteria, e. Coli, and specific pathogenic species of bacteria. Globally only 27% of the rural population has water piped directly to their home and 24% rely on unimproved sources. **Of the 884 million people without access to an improved water source, 746 million people (84%) live in rural areas** (State of Rhode Island Department of Health, n.d.).

H. Wastewater Treatment:

i. *Sewage treatment or wastewater treatment is a process of removing contaminants from wastewater and household sewage, but runoff and domestic.* It includes removing physical, chemical and biological contaminants. The objective is to produce an environmentally safe fluid waste stream and a solid waste suitable for disposal or reuse (Fonai, G., 2010). Sewage treatment usually involves three stages:

   i. Primary treatment temporarily holds the sewage in a basin where heavy solids settle to the bottom while, oil, grease, and other lighter solids float to the top. The heavy and lighter solids are removed, and the remaining liquid may go through another secondary treatment.

   ii. Secondary treatment removes dissolved and suspended biological matter.

   iii. Tertiary treatment is a step following the secondary treatment. Sometimes treated water is disinfected chemically or physically.

I. Solid and Hazardous Waste:

j. Hazardous waste has properties that make it dangerous or potentially harmful to human health or the environment. The EPA has two ways to
identify solid wastes that are hazardous. A waste is considered hazardous if it exhibits certain hazardous characteristics or if it is included on a specific list of wastes EPA has determined to be potentially hazardous to a human’s health or the environment. Four hazardous waste characteristics are ignitability, corrosivity, reactivity, or toxicity (Environmental Protection Agency, n.d.).

J. Recycling and Resource Recovery:

k. Recycling turns wastes into valuable products. Recycling takes recyclable material such as bottles, newspapers, cans, and processes them into raw materials such as fibers and manufacturing the raw materials into new products. Recycling helps the environment by reducing the need for landfilling and incineration, prevents pollution, and decreases emissions of greenhouse gases (Department of Sustainability, Environment, Water, Population and Communities, n.d.).

K. Industrial Ecology:

l. Industrial ecology is an attempt to understanding the impacts of industrial systems on the environment. This helps to identify and then implement strategies to reduce the environmental impacts of products and processes associated with industrial systems, the ultimate goal of sustainable development. Some researchers feel that industrial ecology involves identifying and implementing strategies for industrial systems to more closely emulate harmonious, sustainable, ecological ecosystems (Garner, A., and Keolelan, G., 1995).
IV. Political Processes and the Future

A. Environmental Laws, Policies, and Ethics:

a. Environmental laws are created to protect the environment and natural resources affected, impacted, or endangered by human activities. The EPA (Environmental Protection Agency) was set up as an autonomous regulatory body to oversee the enforcement of environmental policy. The EPA is responsible for establishing and enforcing environmental protection standard, conduct research on adverse effects of pollution, assist in identifying methods and equipment to control pollution and working with the Council of Environmental Quality to develop and recommend to the President new policies to protect the environment (Lightopedia, n.d.).

B. Planning and Decision-Making:

b. Environmental decision making and policy making are based on quantified data based on the environment’s vulnerability, status of conservation, and its ability to recover. Recently demand has been put on the scientific community to produce indicators to direct conservation investments. Due to the fact that answers are needed in a short time frame, scientist have attempted to substitute measures calculated by using indicators that are easily measured or available. These have been and are still in development to serve as a base to make critical decisions on the Environment (Villa, F., and McLeod, H., 2002).

C. International Policy Conflicts and Agreements:

c. Attention began to increase in regard to global environmental problems during the Cold War era particularly after 1972. That was when the world's first international environmental conference was held, and it has come be known as the Stockholm Conference. It’s a global conference and attracted
114 countries such as China, but the Soviet bloc states were missing. Policymakers and diplomatic representatives to the UN, think environmental meant that they had to establish global entities capable of nurturing environmental solutions into full-fledged regimes.

UNEP (United Nations Environmental Program) is one of the most important bodies created by the Stockholm Conference. Between the 1972 Stockholm Conference and 1992 United Nations Conference on Environment and Development, several hundred bilateral and multilateral environmental treaties were signed (Zebich-Knos, M., n.d.).

D. Future Issues of Population, Food Supply, Energy, and Pollution:

d. Population is a serious global issue as it is closely linked to the environmental and human health conditions. While human population grows, the Earth’s size and resources will remain the same. Technology can increase the amount of food that can be produced on a piece of land, but it can’t increase the amount of land and water on the planet. More people mean more resources and energy will be used and more pollution will be created and more waste in landfills. Growth in population will also lead to deforestation to build new homes, more cars on the roads and more fossil fuels used and more gases released into the Earth’s atmosphere (Pollution Issues, n.d.)
Dantes Test Prep Environment and Humanity Practice Test

1. A natural system consisting of all living and nonliving things that coexist to function as an ecological unit is known as the ______.
   a. Atmospheric Structure
   b. Biogeochemical
   c. Ecosystem
   d. Global Ecology

2. The interaction of the organisms and how it survives if the planetary environment is what study?
   a. Atmospheric Structure
   b. Biogeochemical
   c. Ecosystem
   d. Global Ecology

3. The division of vertical layers and the characteristics of the chemical composition produce what type of variations?
   a. Atmosphere
   b. Environment
   c. Nature
   d. Temperature
4. The atmospheric layer closest to the planet is known as _____.
   a. Troposphere
   b. Stratosphere
   c. Mesosphere
   d. Thermosphere

5. A decreasing concentration of ozone and water vapor is known as ____ .
   a. Troposphere
   b. Stratosphere
   c. Mesosphere
   d. Thermosphere

6. Separated by the mesopause, the _____ temperature increases from 1000km to 1500km.
   a. Troposphere
   b. Stratosphere
   c. Exosphere
   d. Thermosphere

7. Producers are green plants that produce what source of energy?
   a. Electricity
   b. Food
   c. Light
   d. Oxygen
8. _____ are animals that eat plants and other animals.
   a. Herbivores
   b. Carnivores
   c. Omnivores
   d. Thorivores

9. Consumers eat food made by the _____.
   a. Decomposers
   b. Producers
   c. Omnivores
   d. Thoriores

10. Plants and animals that break down dead plants and animals into organic materials are known as ____.
    a. Producers
    b. Consumers
    c. Creator
    d. Decomposers

11. The total richness of biological variation is known as ____.
    a. Biodiversity
    b. Genetic Variation
    c. Stability
    d. Organism Changes
12. Stability is the measurement of resilience and _____.
   a. Flexibility
   b. Elasticity
   c. Litheness
   d. Resistance

13. The flow of energy through a food chain is known as _____.
   a. Energy Flow
   b. Decomposing Flow
   c. Power Flow
   d. Solar Flow

14. The feeding position in a food chain is known as _____.
   a. Trophic Levels
   b. Trophic Food Webs
   c. Food Chain
   d. Food Webs

15. Biogeochemical cycling is the changes that a particular element goes through as it passes back and forth through what system?
   a. Atmosphere
   b. Biological
   c. Earth
   d. Ecological
16. A large community of plants and animals that occupy a distinct region defined by its climate and dominant vegetation is known as _____.
   a. Biome
   b. Productivity
   c. Population Biology
   d. Evolution

17. Evolution is a process in which species of organisms undergo changes over time. Evolution involves what process?
   a. Evolution Selection
   b. Genetic Selection
   c. Natural Selection
   d. Population Selection

18. The gradual process in which ecosystems change and develop over time is known as _____.
   a. Colonization
   b. Establishment
   c. Migration
   d. Succession

19. Beginning with the empty pond, insects and beetles soon arrived and brought other creatures such as microscopic plants and animals is the method of _____.
   a. Colonization
   b. Establishment
   c. Migration
   d. Succession
20. The act of seeds being carried or blown by the wind and its growth and development is known as _____.
   a. Colonization
   b. Establishment
   c. Migration
   d. Succession

21. Establishment, Competition, Stabilization and Climax are four out of six stages that occur in _____.
   a. Ceratophyllum
   b. Hydrilla
   c. Hydrosere
   d. Vallisneria

22. Human population growth is growing as about ____% annually.
   a. 1
   b. 1.5
   c. 2
   d. 2.5

23. ____ is the average weather in a given place and changes over time.
   a. Atmosphere
   b. Climate
   c. Conditions
   d. Environment
24. _____ is the rise in temperature that is now underway in the Earth’s atmosphere and oceans.
   a. Earth Increase
   b. Earth Warming
   c. Global Increase
   d. Global Warming

25. What causes greenhouse gases?
   a. Trapping of the sun’s radiation in the atmosphere
   b. Trapping of oxygen in the atmosphere
   c. Trapping of water vapor in the air
   d. Trapping of carbon dioxide in the air

26. The ____ is a poisonous blue form of oxygen that occurs naturally in large concentration in the stratosphere.
   a. Ozone Layer
   b. Ozone Level
   c. Oxygen Layer
   d. Oxygen Level

27. _____ ozone is very important to life on the surface of Earth because it absorbs much of the incoming solar ultraviolet radiation and shields the organisms from its damaging effects.
   a. Mesosphere
   b. Stratospheric
   c. Thermosphere
   d. Troposphere
28. Anything that corrupts, degrades, or makes something less valuable or desirable can be considered _____.
   a. Contagion
   b. Contamination
   c. Effluence
   d. Pollution

29. When acid rain falls on lakes or streams, the resulting acidification can change the water’s nutrient balance, kill aquatic organism and _____.
   a. Decrease Biodiversity
   b. Increase Biodiversity
   c. Re-growth of organism
   d. Reduce acidic levels

30. When slow moving bodies of water receive too much agricultural runoff; the pollutants stimulate the growth of algae, causing an algal bloom that depletes oxygen is the process of _____.
   a. Eutrophication
   b. Hypertrophication
   c. Hypoxia
   d. Meiotrophication

31. Pollution can destroy ____ that provides food and shelter.
   a. Ecological Production
   b. Industrialization
   c. Ultraviolet Radiation
   d. Vegetation
32. _____ is the process of analyzing and evaluating the possibility of adverse ecological effects caused by pollution.
   a. Environmental Rate Assessment  
   b. Environmental Risk Assessment  
   c. Energy Rate Assessment  
   d. Energy Risk Assessment  

33. The Agricultural and _____ revolution saw a massive and rapid increase in agricultural productivity and vast improvements in farm technology during the 18th and 19th century.
   a. Engineering  
   b. Industrial  
   c. Machinery  
   d. Mechanized  

34. Industrial growth in countries like Latin America, Asia and Africa’s is fueled by _____ to countries with bigger economies.
   a. Exporting  
   b. Importing  
   c. Releasing  
   d. Selling  

35. Burning of _____ could replace the need for human labor but may lead to more pollution.
   a. Coal  
   b. Energy  
   c. Oxygen
36. The cutting down and removal of all or most of the trees in a forested area is known as _____.
   a. Biodiversity
   b. Deforestation
   c. Desertification
   d. Eutrophication

37. Climate change and the transformation of land once suitable for agriculture into desert is known as _____.
   a. Biodiversity
   b. Deforestation
   c. Desertification
   d. Eutrophication

38. ____ is the process of heightened biological productivity in a body of water.
   a. Biodiversity
   b. Deforestation
   c. Desertification
   d. Eutrophication

39. Lake Eerie is an example of excessive _____.
   a. Biodiversity
   b. Deforestation
   c. Desertification
   d. Eutrophication
40. Energy source that can be easily replenished is known as ____.
   a. Renewable Energy
   b. Non-Renewable Energy
   c. Regenerated Energy
   d. Non-Regenerate Energy

41. American Scientist Norman Borlaug is known for what revolution?
   a. Agricultural
   b. Borlaug
   c. Green
   d. Global

42. Agricultural practices led to the loss of soil, increased pollution of watersheds, and the loss of ____.
   a. Habitat and Wildlife
   b. Oxygen and Carbon monoxide
   c. Agricultural products
   d. Water waste and Terrestrial

43. ____ is maintaining good soil health and preventing soil erosion.
   a. Environmental Protection
   b. Land Use Activities
   c. Air Pollution Control
   d. Soil Conservation
44. A substance or mix of substances used to prevent or destroy pests is known as ____.
   a. Agricultural
   b. Pesticides
   c. Soil Conversation
   d. Wastewater Treatment

45. What process helps reduce the release of pollutants into the environment?
   a. Agricultural Control
   b. Pesticide Control
   c. Pollution Control
   d. Wastewater Treatment Control

46. Of the 884 million people are without access to an improved ____ source, 746 million live in rural areas.
   a. Chemical
   b. Organic
   c. Pathogenic
   d. Water

47. What is the process of removing contaminants from household sewage known as?
   a. Hazardous Waste
   b. Recycling Recovery
   c. Solid Waste
   d. Wastewater Treatment
48. How does recycling material such as bottles, newspapers, and cans be beneficial to the environment?
   a. Decrease emission of greenhouse gases
   b. Decrease waste in the environment
   c. Increase emission of greenhouse gases
   d. Increase the level of pollution to a minimal

49. ____ are created to protect the environment and natural resources affected, impacted or endangered by human activities.
   a. Conservation Protection
   b. Environmental Laws
   c. Planning and Decision Making
   d. International Policy Agreements

50. ____ was set up as an autonomous regulatory body to oversee the enforcement of environmental policy.
   a. Ecological Protection Agency
   b. Ecological Political Agency
   c. Environmental Protection Agency
   d. Environmental Political Agency
Answer Key

1. C) Ecosystem
2. D) Global Ecology
3. D) Temperature
4. A) Troposphere
5. C) Mesosphere
6. D) Thermosphere
7. B) Food
8. C) Omnivores
9. B) Producers
10. D) Decomposers
11. A) Biodiversity
12. D) Resistance
13. A) Energy Flow
14. A) Trophic Levels
15. C) Earth
16. A) Biome
17. C) Natural Selection
18. D) Succession
19. C) Migration
20. A) Colonization
21. C) Hydrosere
22. B) 1.5
23. B) Climate
24. D) Global Warming
25. A) Trapping of the sun’s radiation in the atmosphere
26. A) Ozone Layer
27. B) Stratospheric
28. D) Pollution
29. A) Decrease Biodiversity
30. A) Eutrophication
31. D) Vegetation
32. B) Environmental Risk Assessment
33. B) Industrial
34. A) Exporting
35. A) Coal
36. B) Deforestation
37. C) Desertification
38. D) Eutrophication
39. D) Eutrophication
40. A) Renewable Energy
41. C) Green
42. A) Habitat and Wildlife
43. D) Soil conservation
44. B) Pesticides
45. C) Pollution Control
46. D) Water
47. D) Wastewater Treatment
48. A) Decreases emission of greenhouse gases
49. A) Environmental laws
50. C) Environmental Protection Agency
References


