**Environmental Science Fall BM2 Review**

Brodnax

Answer on your own paper in complete sentences.

**Intro Unit**:

1. What is environmental science? An multidisciplinary field that integrates physical, biological and information sciences (including ecology, biology, physics, chemistry, zoology, mineralogy, oceanology, limnology, soil science, geology, atmospheric science, and geodesy) to the study of the environment, and the solution of environmental problems.
2. Who is Henry David Thoreau and how was he influential to environmental awareness?

Early environmentalist and wrote the book Walden after living alone on the shore of Walden Pond.

1. Who is John Muir and how was he influential to environmental protection?

Influential to environmental studies because he was the first person to suggest the idea of protecting the wilderness for future generations to enjoy. Led to national parks.

1. What are the steps in the scientific method?

Observation, Question, Hypothesis, Experiment, Collect Data, Analyze and Conclude, Communicate Results.

1. What is a controlled experiment?

An experiment that tests for only 1 variable.

1. Define the following experimental variables: independent, dependent, and control.

Independent- the variable that is changed or manipulated. Located on the X axis.

Dependent- The variables that responds to the change. Located on the y axis.

Control- variable that is kept the same for the whole experiment.

1. Why do scientists use the metric system of measurement?

It is a universal system of measurement.

1. What are the base units for length, mass, volume and temperature?

Length= meter

Mass= gram

Volume= liter

Temperature= celcius

1. What is the mnemonic for converting units in the metric system?

King Henry Died By Drinking Chocolate Milk (Kilo- Hecto- Deka- Base deci- centi- milli-)

1. What is an ecological footprint?

The impact of a person or community on the environment, expressed as the amount of land required to sustain their use of natural resources.

**Ecology**:

1. List the levels of ecological organization starting with individuals.

1. Species

2. Population

3. Community

4. Ecosystem

5. Biome

6. Biosphere

1. Differentiate between a habitat and a niche.

A habitat is where an organism lives. A niche is an organism's job.

1. Describe and give examples of biotic and abiotic factors.

Biotic= living Ex. Animal, plant, bacteria

Abiotic= nonliving Ex. Wind, water, rock, temperature

1. Explain what the range of tolerance is for various environmental factors.

The range in which factors must be for the organism to survive.

1. Define and give an example of intraspecific competition.

Competition within the same species. Ex- Reproduction

1. Define and give an example of interspecific competition.

Competition with different species. Ex- Competition for space

1. Define and give an example of predation.

Predator and prey. Predator eats prey. Predator- Trout, Prey- Mayfly

1. Define and give an example of mutualism.

Both organisms benefit. Bee and flower

1. Define and give an example of parasitism.

1 benefits and the other is harmed. Must have a host. Dog and Fleas

1. Define and give an example of commensalism.

1 benefits and the other is unaffected. whale and barnacle

1. List 4 abiotic factors that can limit organism distribution. Precipitation, wind, temperature, fire
2. Draw a food chain and label each tropic level.

producer- first trophic level (Grass) ->primary consumer- 2nd trophic level (grasshopper)-> secondary consumer- 3rd trophic level (rabbit) ->tertiary consumer- 4th trophic level (wolf)

1. Differentiate between decomposers and detritivores.

Decomposers break down dead or decaying matter, detritivores feed on dead or decaying matter.

1. Differentiate between photoautotrophs and chemoautotrophs.

Photoautotrophs use sunlight and photosynthesis

Chemoautotrophs use chemicals and chemosynthesis

1. What is a keystone species?

a species on which other species in an ecosystem largely depend, such that if it were removed the ecosystem would change drastically.

1. Differentiate between native and nonnative species. What are other names for nonnative species?

Native is originally from the area, nonnative (invasive) were introduced

1. Define the 1st and 2nd laws of thermodynamics.

1st- energy cannot be destroyed but can be transformed.

2nd-When energy is changed from one form to another, we always end up with lower-quality or less usable energy than we started with (usually heat).

1. How much energy is transferred through a food chain? What is each step in a food chain called? Where does the lost energy go?

10% is passed to the next level, trophic level, eliminated as heat

1. What is Biomass? How does it affect a food chain?

The total amount of living tissue, Producers have the most and it decreases as trophic levels increase.

1. Define and give an example of biomagnification.

The toxin concentration increases as you increase trophic levels. DDT

1. How do you calculate population growth?

Birth rate and immigration- increase population growth

Death rate and emigration- decrease population growth

1. Contrast exponential and logistic growth.

Exponential- steady growth, J-curve, must have unlimited resources

Logistic- logical, reaches a carrying capacity, S-curve

1. What is carrying capacity?

The maximum number of individuals an area can provide resources.

1. Define and give examples of density dependent limiting factors.

Depend on the size of the population. Ex- Competition, disease, parasitism

1. Define and give examples of density independent limiting factors.

Occurs no matter the size of the population. Ex- Human impact and natural disasters

1. Contrast primary and secondary succession.

Primary- no soil (bare rock), forms from volcanic eruption, first organisms include lichens and mosses.

Secondary- soil is present, forms from forest fires or flooding, first organisms include annual grasses and weeds.

1. What is a pioneer species?

First organism to occupy an area (Ex. Lichens and mosses)

1. Explain how water flows through ecosystems and explain how humans impact this cycle.

a. Evaporation- liquid to gas

b. Precipitation- rain, snow, sleet, or hail falling from the sky

c. Transpiration- water evaporating from plants through the stomata

d. Condensation- water vapor changing to a liquid

Humans have a major impact with water pollution

1. How is the flow of matter different from the flow of energy in an ecosystem?

Energy flows in 1 direction, matter is recycled

1. Explain how carbon flows through ecosystems and explain how humans impact this cycle.

Humans add more CO2 by burning fossil fuels.

Into Atmosphere- Respiration, Burning fossil fuels, volcanic activity

Out of atmosphere- photosynthesis

1. Explain how nitrogen flows through ecosystems and explain how humans impact this cycle.

Nitrogen fixation- Atmospheric Nitrogen (N2) -> Ammonia (NH3)

Denitrification- Nitrates (NO2 and NO3) -> Atmospheric Nitrogen (N2)

1. Explain how phosphorus flows through ecosystems and explain how humans impact this cycle.

Not found in the atmosphere, only in soil and rocks

**Biodiversity**:

1. What makes up the climate of a region?

Average temperature and precipitation

1. How is climate different from weather?

Climate is yearly average and weather is day to day

1. Describe where the different temperature zones are located on Earth?

Above/below 23o north and south= temperate zone

Between 23o north and south= tropical zone

1. In terms of moisture, what does arid, semi-arid, semi-humid, and humid mean?

Arid- dry

Semi-arid- semi-dry

Semi-humid- semi-wet

Humid- wet

1. The moisture of a biome is determined by what 2 factors?

Precipitation and Evaporation

1. List and describe the 5 air masses affecting North America.

Continental = dry, inland Maritime = wet, coastal

Polar = cold Arctic = very cold Tropical = warm

Continental arctic: inland, dry and very cold air

Continental polar: inland, dry and cold air

Continental tropical: inland, dry and warm air

Maritime polar: coastal, moist and cold air

Maritime tropical: coastal, moist and warm air

1. Describe the characteristics of a cold front.

a cold air mass pushes the warm air mass up, cumulus clouds form, and heavy rain/snow storms occur

1. Describe the characteristics of a warm front.

a warm air mass stretches over a cold air mass, stratus clouds form, and steady rain/snow falls