**Mid-term Exam Review**

**Unit 1-Characteristics of Life/Scientific Method**

1. Explain **why** the following are important characteristics necessary for living things to maintain life (give examples):
   1. **S**ynthesis
   2. **T**ransport
   3. **E**xcretion
   4. **R**espiration
   5. **N**utrition
   6. **G**rowth and Development
   7. **R**eproduction
   8. **R**egulation
2. List the steps to the scientific method
3. Using an example, explain the difference between an independent and a dependent variable.
4. What is a hypothesis? Provide an example of a properly worded hypothesis.
5. Define the following: Independent variable, Dependent variable, control, constant

**Unit 3 Biochemistry**

1. What is pH?
2. What are acids on the pH scale? An example of an acid is \_\_\_\_\_\_\_
3. What are bases on the pH scale? An example of a base is \_\_\_\_\_\_
4. What is neutral on the pH scale? An example of a neutral substance is\_\_\_\_\_\_\_.
5. What is a monomer?
6. What is a polymer?
7. Make AND complete the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Macromolecule | Monomer Form | Elements | Function | Example |
| Carbohydrate |  |  |  |  |
| Lipids |  |  |  |  |
| Proteins |  |  |  |  |
| Nucleic Acids |  |  |  |  |

1. What is the function of an enzyme?
2. What is a substrate?
3. What is an active site?
4. What does benedict’s reagent test for in the lab?
5. What does iodine test for in the lab?
6. What does biruet’s test for in the lab?
7. How do you test for lipids?

**Unit 4-Cells**

1. List **two** differences between prokaryotic and eukaryotic cells.
2. An example of a prokaryotic cell is\_\_\_\_\_\_\_\_\_\_. An example of an eukaryotic cell is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Define an ***organelle*** in your own words.
4. Identify the CELL function of the following organelles (what is the job/role in the cell):
   1. Nucleus
   2. Ribosome
   3. Golgi Apparatus/complex
   4. Endoplasmic Reticulum
   5. Mitochondria
   6. Chloroplasts
5. What is the plasma membrane composed of?
6. What is the function of the plasma membrane?
7. Identify two characteristics that are different in plant cells than animal cells.
8. What is Robert Hooke known for?
9. What is Anton Leeuenhoek known for?
10. What are the three parts of the Cell Theory?

**Unit 5-Cell Transport/Photosynthesis/Cellular Respiration**

1. Compare and Contrast Passive Transport and Active Transport
2. List AND explain the 3 types of Passive Transport
3. Osmosis exists within three types of solutions (Hypotonic, Hypertonic, and Isotonic). Explain **each by giving an example**.
4. Write the CHEMICAL Equation for photosynthesis.
5. Using a picture, explain how each component of photosynthesis is either absorbed or released. (Use a picture of a leaf to explain what is absorbed and what is released)
6. Write the CHEMICAL Equation for cellular respiration.
7. WHY is cellular respiration important? (What does it make?)
8. Photosynthesis takes place ONLY in \_\_\_\_\_\_\_\_\_\_\_\_ cells. Cellular respiration takes place in both   
   \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ cells.
9. Photosynthesis takes place in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(organelle). Cellular respiration takes place in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (organelle)
10. Differentiate between aerobic and anaerobic respiration. Make sure to include which is more efficient and which produces more ATP.

**Unit 5-DNA**

1. DNA is a \_\_\_\_\_\_\_\_\_\_ (which biomolecule?)
2. DNA is composed of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_.
3. DNA stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. DNA is \_\_\_\_\_\_\_\_\_\_\_\_ stranded
5. Replicate the following DNA strand:

AATGCCGATTACA

1. What is the function of DNA?
2. ~~Explain how RNA is different than DNA (3 factors make it different)~~

~~Change the following DNA strand into mRNA: TATGCAGGTATCGTA~~

**Unit 13 - Ecology**

**Vocabulary: Words to Know and Define**

|  |  |  |  |
| --- | --- | --- | --- |
| Ecology | Autotroph | Heterotroph | Producer |
| Consumer | Primary Consumer | Secondary Consumer | Tertiary Consumer |
| Decomposer | Abiotic | Biotic | Carrying Capacity |
| Limiting Factor | Deposition | Decomposition | Predation |
| Competition | Symbiosis | Mutualism | Commensalism |
| Parasitism | Greenhouse Effect | Logistic | Exponential |
| Herbivore | Carnivore | Omnivore | Detrivore |

**Interrelationships**

Identify the type of relationship describe in the following examples:

1. The clever Honey-Finder birds lead humans to beehives so that human hands will open the dangerous beehive and expose the precious honeycomb for the bird to access.
2. Tapeworms are segmented flatworms that attach themselves to the insides of the intestines of animals such as cows, pigs, and humans. They get food by eating the host's partly digested food.
3. Mistletoe attaches to a tree and sends out roots that penetrate the tree and feeds off of some of the tree’s nutrients and minerals.
4. [Clownfish](http://en.wikipedia.org/wiki/Clownfish) dwell among the [tentacles](http://en.wikipedia.org/wiki/Tentacle) of tropical [sea anemones](http://en.wikipedia.org/wiki/Sea_anemone). The territorial [fish](http://en.wikipedia.org/wiki/Fish) protects the anemone from anemone-[eating](http://en.wikipedia.org/wiki/Eating) fish, and in turn the [stinging](http://en.wikipedia.org/wiki/Sting_%28biology%29) tentacles of the anemone protect the clownfish from its [predators](http://en.wikipedia.org/wiki/Predator) (a special [mucus](http://en.wikipedia.org/wiki/Mucus) on the clownfish protects it from the stinging tentacles).
5. A smaller tree in the rain forest receives less sunlight from an adjacent tree that is larger than it. Both of the trees need this sunlight in order to survive, reproduce and grow.

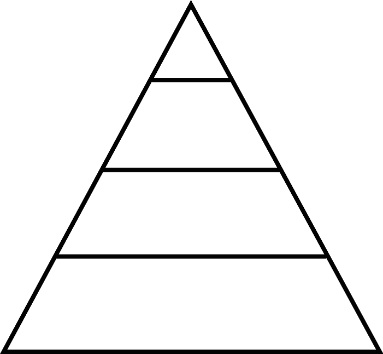
Differentiate between biotic and abiotic factors

What are 3 examples of biotic factors? What are 3 examples of abiotic factors?

- **Be able to identify abiotic factors in specific ecosystems.**

**- Be able to explain the way that abiotic factors support specific living organisms.**

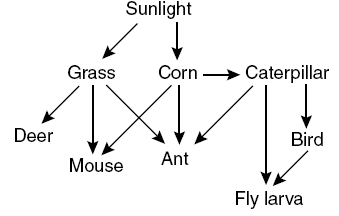
If there are enough grasshoppers to feed 125 toads, enough lily pads and space to support 270 toads and enough water to support 51 toads, what is the carrying capacity and what is the limiting factor?

**Energy Flow and Cycling of Matter**

Identify the producers, the primary consumers, and the decomposer in this food web.

Who receives the most energy in this food web and who receives the least?

What is the original source of energy for the fly larva?



Energy Pyramids:

1. How much energy moves from one level to the next?
2. What do the organisms do with the energy that is available to them?
3. Which of the following is one way that energy is lost in an ecosystem?
   1. Nitrogen
   2. Carbon dioxide
   3. Heat
   4. Precipitation
4. What type of organism would be found at each level?
5. What are examples of the organisms that can be found at each level?
6. Is the energy transfer through ecosystems efficient?
7. Why are producers at the bottom of the energy pyramid?
8. What is the original source of energy for all organisms?
9. At which level would there be the most concentration of non-biodegradable substance?

- Know how to find the amount of energy at each level of the energy pyramid

- Be able to explain why energy transfer is depicted as a pyramid

- Be able to explain why an ecosystem can support more primary consumers than top-level consumers

Is energy recycled in an ecosystem? Why is the carbon cycle considered a cycle?

Explain the difference between the way that energy flows through an ecosystem and the way that matter is cycled through an ecosystem.

Draw the carbon cycle.

What is atmospheric carbon?

How is atmospheric carbon transferred to biotic factors in the ecosystem?

What is the main source of carbon dioxide emissions?

**Human Impact on the Environment**

- Be able to explain the overall impact that humans have on the environment and provide examples.

- Be able to accurately explain global warming, greenhouse effect, ozone depletion and deforestation.

- Be able to give ways that humans can prevent the negative effects on the environment and explain things we can do to stop the negative effects that have already begun.

What is main gas responsible for global warming trends?