

# Advanced Biology Summer 2024 Assignment

May 2024

Hi Future Advance Biology Falcon!

Welcome to Advanced Biology! I hope that you have a great summer and will be ready to return to school to learn and work hard this year! High school is quite different than middle school, and you will suddenly be expected to be more responsible, more self-disciplined, and more mature than you have been in the past. It is challenging but will also be very rewarding as it will prepare you for harder classes later in high school.

Now is a good time to decide if taking advanced science classes is right for you. You will have homework on a regular basis (several times per week), challenging assignments to complete in class, and you will complete numerous projects – a few will be completed individually at home while some will be completed at school with a group. You will also need to be able to work within a group and will be expected to present some projects in front of classmates. And, you may find that you need to attend tutorials to better understand the content we cover in class. All of this is meant to help you develop skills that will be beneficial to you your whole life. *So...are you up for the challenge??*

In order to get you acquainted with Advanced Biology, you have this summer project that will be due the first week of school, but you need to complete it over the summer so that you are not stressed when school starts.....realize that when school starts, you will have assignments from class starting the first day of school so it is a good idea to get these finished and out of the way! These summer project assignments will count as four daily grades so you have a chance to start off strong if you choose to do so.

All items which are attached in this packet should be printed\* and *handwritten* – and your handwriting should be legible. Typed responses will not be accepted. Also, be aware that for advanced students in high school, one day late is a maximum of 70%, two days late is a maximum of 50%, and assignments are not accepted after the 2<sup>nd</sup> day – a ZERO is entered in the gradebook without the option for makeup – so, **pay attention to your due dates!!** \*If you need a printed copy, you can request one from the front office at the high school (or your current science teacher).

If you have questions, you can email me during the summer; my email is [ckuchan@huffmanisd.net](mailto:ckuchan@huffmanisd.net). However, I will not be checking email every day during June and July so be patient awaiting a response. I will begin checking email daily on Thursday, August 1<sup>st</sup>. Also, when you sign up for your homework account on UT Quest, be patient for acceptance during June and July; I will check it about once a week.

I look forward to meeting you in August and hope you are ready for this fast-paced, challenging class that prepares you for more advanced science courses like Advanced Chemistry, Advanced Physics, AP Biology, AP Environmental Science, and/or AP Chemistry. Your success will be determined by YOU!!

*Mrs. Catherine Kuchan*

Advanced Biology Instructor

Hargrave High School, Huffman ISD

Summer Assignment 2024 Instructional  
[video](#) and QR code:



Summer Assignment [Google Drive](#)  
and QR Code for assignment links:



## Assignment Details and Due Dates

Assignment	Instructions	Due Date	Points Available	Points Earned
Sign up for UT Quest	<p>Watch this <a href="#">video</a> to learn how to create an account for homework assignments on UT Quest; you will need to “enroll” and request approval to join the class.</p> <p style="text-align: center;">Class Unique ID: AdvBio24</p> <p style="text-align: center;">Create a <b>password</b> with <u>lowercase bio</u> and your <u>lunch code</u>  <i>Example: bio123456</i></p> <p style="text-align: center;"><b>Do not include spaces or other characters.</b></p>	Wednesday, August 7 <sup>th</sup>	----	----
“Getting to Know You” Survey	<p>Complete the <a href="#">Getting to Know You Form</a>: you need to be logged into your <b>SCHOOL Google Account</b> to access the form.</p> <p style="text-align: center;"><b>For full points</b>, follow the directions in the form (e.g. use complete sentences, etc)</p>	Wednesday, August 7 <sup>th</sup>	100 points	
Lab Safety Virtual Activity	<p><b>Print the Lab Safety Review</b> attached below, go to this <a href="#">Virtual Lab</a> and <b>complete the interactive</b>. Answer the questions on the worksheet <b>AND print your completion certificate</b>.</p>	Friday, August 9 <sup>th</sup>	100 points	
Science Notes	<p><b>Print the Science Notes</b> attached below and use the <a href="#">Introduction to Biology PowerPoint</a> to complete.</p>	Monday, August 12 <sup>th</sup>	----	----
UT Quest Summer 2024 Science Review  *Individual Grade*	<p>Once you have been approved to join the AdvBio24 UT Quest class, <b>complete</b> the <b>online</b> Summer 2024 Science Review assignment. This is to be completed from the knowledge in your head and the <b>Science Notes</b> above.</p> <p style="text-align: center;">**No internet or other resources (parents, etc).** 😊</p>	Monday, August 12 <sup>th</sup>	100 points	
Vocabulary One-Pager  *Individual Grade*	<p>Use the vocabulary in this packet and <u>one side of a sheet of paper</u> to <b>create a “one-pager”</b>. <b>Choose 15 words</b> to include through a combination of <b>pictures, keywords, and/or definitions</b>. <b>Include your name, a title, and a biology-related border</b> around the edge (can be some of the vocab). <b>Color it!</b>  <i>See an example attached below from an Aquatics class.</i></p> <p><b>You will present</b> this to the class the first few weeks of school.</p>	Monday, August 12 <sup>th</sup>	100 points	

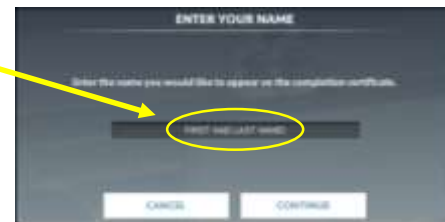
Name \_\_\_\_\_

Date \_\_\_\_\_

## Lab Safety Review (print and complete)

Go to: <https://www.ncbionetwork.org/iet/labsafety/> follow the steps, answering the questions as you go.

**IMPORTANT!!!!** \*\*Use your FIRST AND LAST NAME when prompted to enter your name – you will print the certificate at the end to submit for your grade!\*\*



1. Describe the proper attire required for common lab activities.
2. What is the answer to the Knowledge Check about cell phone, gum, and jewelry?
3. List the required PPE for use in the lab.
4. What is the answer to the Knowledge Check about PPE and Safety?
5. Explain how to create a safe and productive lab environment.
6. List three items which were causing an unsafe lab environment.
7. What is the answer to the Knowledge Check about fire in the lab?
8. Discuss how to properly use safety equipment for a variety of circumstances.  
Choose any three discussed in the activity.
9. What is the answer to the Knowledge Check about the chemicals splashed in the student's eyes?
10. What is the answer to the Knowledge Check about following instructions?

**\*\*PRINT the COMPLETION CERTIFICATE** at the end with your full name (first and last) on it and bring to school; due no later than Friday, August 11<sup>th</sup> at the *beginning* of your class period. \*You can take a screen shot and email it if printing is not an option.\*

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## 2024 Advanced Biology Summer Project Notes (print and complete)

### Biology and the Characteristics of Life

#### I. What is BIOLOGY?

- The study of \_\_\_\_\_ and biological \_\_\_\_\_.

#### WHAT IS THE VALUE OF BIOLOGY?

- Biological principles are daily being applied for the \_\_\_\_\_ in controlling disease, improving health, developing better foods, conserving natural resources, and understanding our environment

#### WHY DO WE STUDY BIOLOGY?

- Industry, agriculture, government, and the medical profession provide unlimited \_\_\_\_\_ to young people with a biological background.
- Students find that biology offers many interesting and rewarding \_\_\_\_\_ as well as giving them a better understanding of themselves and a greater \_\_\_\_\_ of the living things that surround them.

#### HOW DO WE STUDY BIOLOGY?

- Biology students should be \_\_\_\_\_ and use careful judgment. A healthy \_\_\_\_\_, believer in cause and effect, and order in nature is imperative.

#### ANSWER THE FOLLOWING INTRODUCTORY QUESTIONS (your thoughts):

1. How would you define the word LIFE to a young child?
2. What is the basic unit of life?
3. Do you believe there IS life elsewhere in the universe? Explain your answer.
4. List some activities of living things:

#### Cell Theory has \_\_\_\_\_ parts:

- All organisms are made up of \_\_\_\_\_.
- All cells arise from \_\_\_\_\_.
- The cell is the \_\_\_\_\_ unit of life.

#### Two Major Types of Cells

- Prokaryotes have \_\_\_\_\_ DNA, are all \_\_\_\_\_-celled, and lack a \_\_\_\_\_.
- Eukaryotes have \_\_\_\_\_ chromosomes, can be single- or \_\_\_\_\_-celled, have a \_\_\_\_\_ and membrane-bound \_\_\_\_\_. There are four types of eukaryotes:
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
  4. \_\_\_\_\_

## II. Characteristics of Living Things:

1. Made of one or more \_\_\_\_\_:

- \_\_\_\_\_ = basic unit of structure and function of all living things
- Unicellular-bacterium, paramecium, \_\_\_\_\_
- Multicellular-humans, \_\_\_\_\_, plants, etc.

2. \_\_\_\_\_

- Each organized structure in an organism has a specific \_\_\_\_\_
  - Ex: an anteater's snout functions as a container for its long tongue
- All parts form an \_\_\_\_\_ functioning unit

3. \_\_\_\_\_:

- Species must replace themselves
- Is \_\_\_\_\_ necessary for the survival of the \_\_\_\_\_ organism; it is needed for the survival of the \_\_\_\_\_!

4. \_\_\_\_\_:

- Living things grow because their CELLS grow and divide!
- \_\_\_\_\_ = the increase in living material (cellular mass) and the formation of new structures
- \_\_\_\_\_ = the changes that take place during the life of the organism.

5. Responds to Stimuli:

- \_\_\_\_\_ = a condition in the environment that creates a response from the organism.
  - Ex: temperature, weather, other organisms, etc.
- \_\_\_\_\_ = the reaction to a stimulus
  - Critical for the safety and \_\_\_\_\_ of an organism!
    - Ex: \_\_\_\_\_ = shark smells blood in the water; \_\_\_\_\_ = shark moves quickly toward the blood and attacks any organism present

6. Requires \_\_\_\_\_:

- \_\_\_\_\_ = the ability to do work or to make things move.
  - Powers life processes
  - Maintains \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
  - Obtained from the \_\_\_\_\_ they eat. Plants make their own food so they are \_\_\_\_\_.
  - Main source of energy for all life is the \_\_\_\_\_
  - Energy not only flows through the organism, but also through the community.

7. Maintains Homeostasis:

- \_\_\_\_\_ = the regulation of an organism's internal environment to maintain conditions that allow it to live.

- Ex: Human's \_\_\_\_\_ and \_\_\_\_\_, help the body maintain its proper \_\_\_\_\_-regulated by the hypothalamus
- Ex: \_\_\_\_\_ of the blood- regulated by hormones
- Ex: \_\_\_\_\_ regulation for nerve and muscle function- regulated by the kidneys and intestine
- Ex: \_\_\_\_\_ balance-regulated by the pancreas/insulin
- Ex: \_\_\_\_\_ balance-regulated via food/water intake and waste elimination

8. Adaptations Evolve Over Time:

- \_\_\_\_\_ = are inherited changes in structures, behaviors, or internal processes that enable an organism to respond to stimuli (survive).
  - Structure and behavior examples:
    - Long hind legs enable rabbits to quickly avoid predators; fur to \_\_\_\_\_ body temperature; changing fur color for the different seasons
  - Internal stimuli examples:
    - \_\_\_\_\_ balance, \_\_\_\_\_ balance and \_\_\_\_\_
- Movement
- Motion vs. Locomotion – what is the difference?
  - Motion = \_\_\_\_\_
- Locomotion = \_\_\_\_\_

III. The Hierarchy of Life - Biological hierarchy is the levels of organization. Within an organism, from smallest to largest, they are:  
 Cell, \_\_\_\_\_, \_\_\_\_\_, organ system, and \_\_\_\_\_

IV. Basic Needs of Life:

1. Energy

- Ultimate source of energy—> \_\_\_\_\_
- Plants get energy directly from the sun
- \_\_\_\_\_ get energy from dead animals and plants
- Animals get energy from eating \_\_\_\_\_ or an organism that eat plants, which is called a \_\_\_\_\_.

2. Water, Oxygen, and Minerals

- Most organisms need \_\_\_\_\_ in order to survive
- Living things are made up of about \_\_\_\_\_ water

## Nature of Science Notes

\_\_\_\_\_ = Continuous process that seeks to answer questions about the natural world. Science only deals with things that are TESTABLE!

Science is subject to \_\_\_\_\_.

- Pulling medicine off shelves because researchers found out it harms people.
- Scientists thought the world was once flat
- Pluto is no longer considered a planet

## Theory vs. Law

- \_\_\_\_\_ = is an explanation based on many observations (hypothesis is repeatedly verified over time and through many separate experiments)
  - Enable scientists to predict new facts and relationships of natural phenomenon
  - Often revised as new information is gathered.
  - Ex: Cell Theory, Theory of Evolution
- \_\_\_\_\_ = describes relationships under certain conditions in nature
  - Describes but does not explain a natural event
  - Ex: Law of Gravity; Law of Conservation of Matter

## 6 Steps of the Scientific Method:

1. State the \_\_\_\_\_  
Ex: How does red light effect plant growth?

2. Gather \_\_\_\_\_  
About the \_\_\_\_\_

3. Form a \_\_\_\_\_  
A \_\_\_\_\_ must be:

- \_\_\_\_\_
- Related to the \_\_\_\_\_
- Written in " \_\_\_\_\_ " format
- Ex: If a plant is placed under red light, then the plant will not grow very tall.

4. Perform the \_\_\_\_\_

A. Make \_\_\_\_\_ !!

B. Choose the variables:

a) The \_\_\_\_\_ **variable** is the factor that you will change in your experiment. (The \_\_\_\_\_ factor being tested)

- NOT controlled or influenced by something else
- Ex: \_\_\_\_\_

b) The \_\_\_\_\_ **variable** is what you predict will change as a result of \_\_\_\_\_ variation in your experiment.

- IS controlled or influenced by something else (independent variable)



- Ex: \_\_\_\_\_

**Note:** the independent variable influences the dependent variable!

c) A control

- The \_\_\_\_\_ is a group that serves as a standard of comparison.
- It is exposed to the same conditions as the treatment groups except for the \_\_\_\_\_ being tested.
- Ex: a plant placed in \_\_\_\_\_ (not exposed to red light)

C. Decide the number of \_\_\_\_\_

- \_\_\_\_\_ are the repetition of an experiment (trials) and the same conditions are kept in the experiment.
- Provides better statistical data (averages)

D. Specify the \_\_\_\_\_

- The \_\_\_\_\_ in an experiment are the factors that DO NOT \_\_\_\_\_.  
(Ex: temperature, equipment, etc.)
- What your \_\_\_\_\_ you are asking will depend on what question you ask.
- Ex: type of plant, amount of water, type of soil, amount of fertilizer, keeping plants at same temperature, same size pots, etc.

5. Collect and analyze the \_\_\_\_\_

6. Draw \_\_\_\_\_

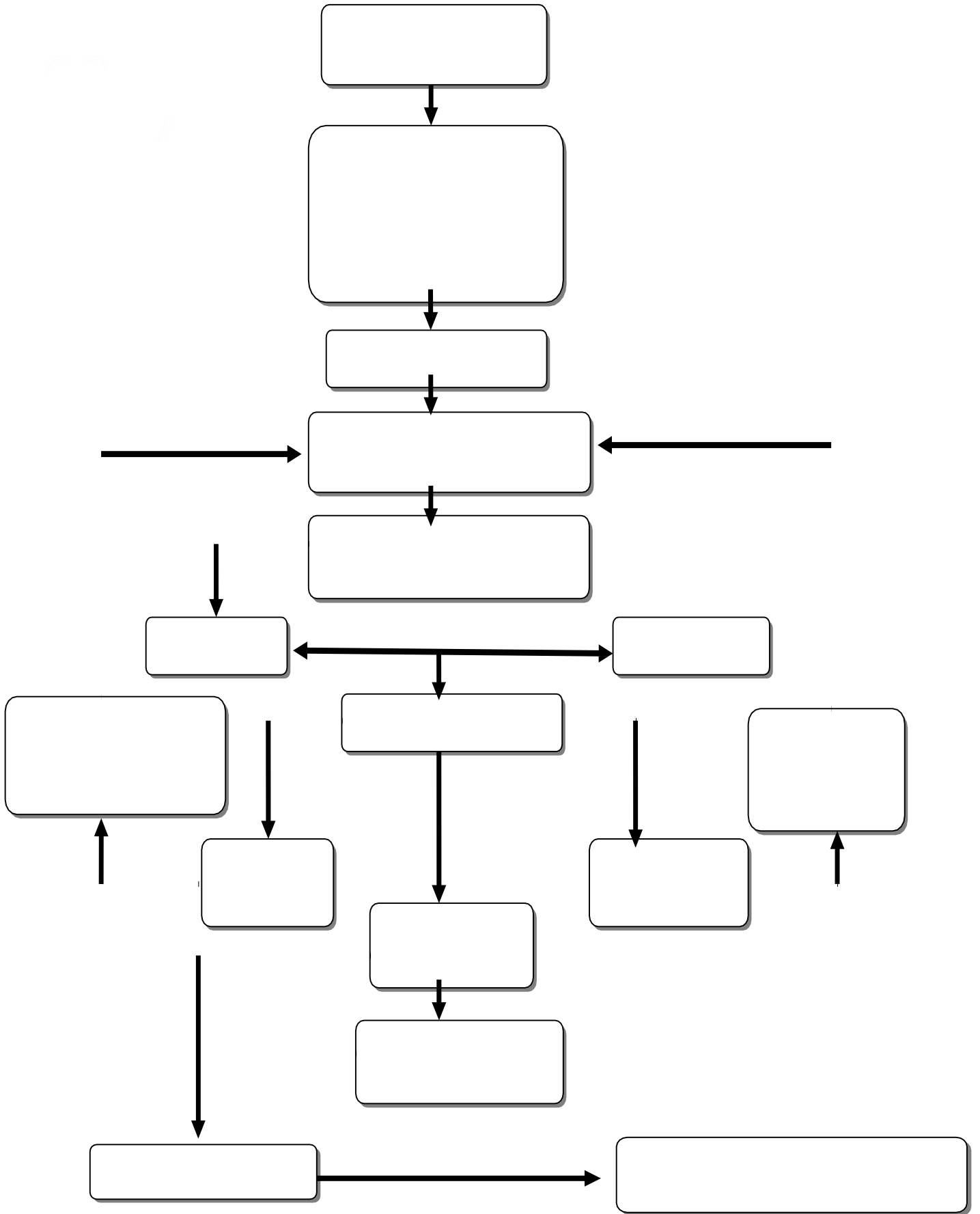
- Describe what happened
- Restate the \_\_\_\_\_
- Explain the results using the \_\_\_\_\_ and \_\_\_\_\_
- Propose an \_\_\_\_\_ based on the data that was collected

Use the Flow Chart on the last slide to complete the remaining blanks:

- There are \_\_\_\_\_ only answers that provide scientists with more information about those questions.
- Questions and collected information help scientists \_\_\_\_\_.
- As experiments are conducted, hypotheses \_\_\_\_\_  
\_\_\_\_\_ be supported.

**\*\*\*COMPLETE THE FLOW CHART ON THE NEXT PAGE.\*\*\***

Use the Science Notes to fill in the flow chart of the Scientific Method (print and complete)



## Characteristics of Life & The Scientific Method Vocabulary (use for One-Pager)

- 1) **Biology** = study of life
- 2) **Cell** = basic unit of structure and function of all living things
- 3) **Energy** = the ability to do work
- 4) **Homeostasis** = the regulation of an organism's internal environment to maintain conditions that allow it to live
- 5) **Nature of Science** = Continuous process that seeks to answer questions about the natural world.
- 6) **Growth** = the increase in living material (cellular mass) and the formation of new structures
- 7) **Development** = the changes that take place during the life of the organism
- 8) **Stimulus** = a condition in the environment that creates a response
- 9) **Adaptations** = are inherited changes in structures, behaviors, or internal processes that enable an organism to respond to stimuli (survive)
- 10) **Biotic** = living or once living components of a community
- 11) **Abiotic** = non-living part of an ecosystem that shapes its environment
- 12) **Hypothesis** = testable explanation; written in " IF... THEN " format
- 13) **Inference** = Logical explanations based on observations and experiences
- 14) **Independent variable** = the factor that you will change in your experiment
- 15) **Dependent variable** = what you predict will change as a result of variation in your experiment
- 16) **Control** = a group that serves as a standard of comparison
- 17) **Replicates** = are the repetition of an experiment (trials) and the same conditions are kept in the experiment.
- 18) **Constants** = the factors that DO NOT change in the experiment
- 19) **Theory** = is an explanation based on many observations (hypothesis is repeatedly verified over time and through many separate experiments)
- 20) **Law** = describes relationships under certain conditions in nature; Describes but does not explain a natural event

# Example of Biology One-Pager

This is not the same vocabulary that you are supposed to do...this is just an example of what a one-pager looks like and this does not include a border which yours will. Use this and the internet for ideas BUT be unique! ☺

## freshwater

- CHARACTERISTICS & EXAMPLES:**
- Contains drinkable water
  - ↳ little to no salt content
  - Only 3% of water on Earth
  - 99% of freshwater contained in ice
- Lakes, ponds, rivers  
wetlands, marshes, swamps

## marine

- CHARACTERISTICS & EXAMPLES:**
- Deeper than freshwater
  - salt water
  - Oceans are 95% unexplored
  - About one million species
  - Highest biodiversity
- Oceans  
Reefs  
Open ocean  
Seas  
Mangrove  
Swamp

### ATOLL:

A reef that is exposed above the surface of the water around a now submerged island



### ANEMONE

**CORAL BLEACHING:**  
Loss of color in a reef that indicates stress. caused by pollution, fluctuating ocean temperatures, & tourism

### BACK REEF:

The shoreward, flat, broadest area of the reef; found in shallow water; can be uncovered during low tide.

# Fringing

### REEF SLOPE:

Found at the outer edge of the Fringing Reef, closest to open ocean. This area is steep, and descends to either shallow sand bottom or depths too deep for coral to grow.

# Reef

### POLYPS:

Marine animals that form coral reefs; commonly called coral-insects.

Coral reefs are known as the "RAIN FORESTS OF THE SEA" and they contain 25% of all known marine species.

Coral reefs protect coastlines from the damaging effects of wave action and tropical storms, they also provide habitats for marine organisms. They also generate half of the Earth's oxygen.



### BLUE-RINGED OCTOPUS

### ABIOTIC FACTORS:



### CORAL