

Welcome Mustangs!

The following summer assignments are to assist you in obtaining background information for the 1st topic we will be learning during 1st quarter, in Biology or Biology Honors.

Please have your **summer assignments completed by Wednesday, August 14th**. Your **1st Quiz will be on Friday, August 16th**.

Please follow the directions carefully, we expect that **each summer assignment will take approximately 1 hour** to complete.

Sincerely,

Your Biology Teachers

Setting Up Your Science Binder

- Obtain a 1" or larger 3-ring binder.
- Obtain 10 section dividers and label them as follows:
 - Bio Basics
 - Ecology
 - Cell Structure
 - Cell Transport
 - Cellular Energy
 - Cell Division
 - DNA
 - RNA
 - Genetics
 - Evolution

Bio Basics Summer HW Checklist:

Please print the learning scale (the next slide) for the Bio Basics Section to be used as the 1st page(s) in the Bio Basics Section of your notebook.

Complete Assignment #1 on the Properties of Life. Please use the teaching video links below as resources to better understand the properties of life.

Characteristics of Life <https://www.youtube.com/watch?v=cQPVXrV0GNA>

8 Characteristics of Life <https://www.youtube.com/watch?v=fYBpsPDla4A>

Complete Assignment #2 on the Macromolecules. Please use the teaching video links below as a resource to better understand macromolecules.

Cell Membranes <http://www.bozemanscience.com/015-cell-membrane>

Biological Molecules <http://www.bozemanscience.com/042-biologoical-molecules>

Bio Basics Learning Scale: Print this page!

Score

Learning Progression

4

I am able to:

- Apply concepts from previous levels in a laboratory setting, using the scientific process.
- Expand on the ideas presented in the previous level by relating the concepts to real world events and situations.

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(Target)

- A. Construct the basic structures of the 4 major macromolecules and summarize their primary functions.
- B. Compare the structural characteristics of mono, di and poly saccharides.
Explain the function of carbohydrates in living things.
- C. Compare the structural characteristics of fatty acids triglycerides phospholipids and steroids.
Explain the function of lipids in living things, especially the cell membrane.
- D. Compare the structural characteristics of proteins and amino acids.
Explain the function of proteins and enzymes, in living organisms.
- E. Predict how the activation energy of biochemical reactions will be affected by enzyme activity.
Predict how environmental factors (pH & temp) will affect enzyme activity.
- F. Relate the special properties of water to its importance in Earth's suitability to maintain life.
- G. Categorize living organisms from the 3 Domains & 6 Kingdoms by characteristics.
- H. Compare the different scientific explanations of the origin of life on Earth.
- I. Explain the method used in science to provide validity.
- J. Describe what characterizes science.
- K. Develop and defend a logical argument as to whether or not viruses are living organisms.
- L. Describe how observations lead to inferences and provide content examples of inferences.

Bio Basics Learning Scale: Print this page!

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- A. State the functions of the 4 major macromolecules.
- B. Draw the various polymers of carbohydrates. List the function of carbohydrates in living things.
- C. Draw the various polymers of lipids. List the function of lipids in living organisms and within the cell membrane.
- D. Draw the structural characteristics of amino acids, the polymers of proteins. Describe how the structure of enzymes affect their function (lock & key).
- E. Compare data on enzyme activity that alters activation energy in a reaction. Observe environmental factor's affect on enzyme activity.
- F. Match properties of water with vital functions to maintain life.
- G. Identify common characteristics of the 3 Domains & 6 Kingdoms of Life.
- H. Summarize 3 different scientific explanations of the origin of life on Earth.
- I. Use Scientific Method to make observations, collect data and display the results by constructing a graph.
- J. Recognize the characteristics of science.
- K. Compare properties of a scientific claim to an alternative argument as to whether or not viruses are living organisms.
- L. Use context clues to make inferences from observations.

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- A. Name the 4 major macromolecules & Identify their basic elements.
- B. Identify the monomers of carbohydrates.
- C. Identify the monomers of lipids.
- D. Identify the monomers of proteins.
- E. Identify the role of enzymes in reactions.
- F. Identify the properties of water; including polarity, heat capacity, cohesion, expansion & universal solvent.
- G. Recognize distinguishing characteristics or properties of Life: highly organized cellular basis, universal genetic code, maintaining homeostasis, metabolism, respond to stimuli, grow and develop during a life cycle, reproduce either sexually or asexually & evolve through adaptations.
- H. Describe the conditions on earth when it was first formed & identify possible theories of life's origin.
- I. Recall the Scientific Method: Observation, Hypothesis, Experiment, Analyze Data, Draw Conclusion & Share Results
Define Control Group, Independent Variable, Dependent Variable, Experimental Group, Sample Size & Validity
Recognize the appropriate time to use a line, bar or circle graph.
- J. List attributes of science.
- K. Define Scientific Claim. Alternate Explanation. Argumentation. Identify the characteristics within a claim used to

Assignment #1 — put this page in Bio Basics Section of Notebook

Characteristics of Life Chart –

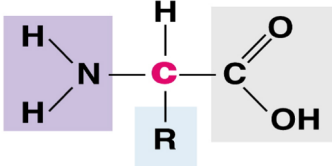
Copy or print this chart in your notebook & then complete it using the resource videos provided on the checklist slide.

All living things...	What does that mean?	Please do the following activity...	Answer in this column or on paper in your notebook.
have CELLULAR ORGANIZATION	Cells are the smallest form of life and organisms can be unicellular (one celled) or multicellular (many cells).	Construct the levels of organization for living things that begins with cells and ends with biosphere.	Cells→ Tissues→ Organs→ Organ Systems→ Organisms→ Populations→ Communities→ Ecosystems→ Biomes→ Biosphere
convert energy for METABOLISM	All organisms require a way to capture and convert energy to perform cellular reactions for life.	Identify the source of energy and tell what it is converted to for Autotrophs & Heterotrophs	Autotrophs: Heterotrophs:
Can RESPOND to stimuli	Internal and external factors help organisms	Identify 2 ways organisms can respond to stimuli for each type of stimuli	Internal Stimuli: 1. 2. External Stimuli: 1. 2.
maintain HOMEOSTASIS	Maintaining a regulated balance within an organism.	Provide 3 examples of ways organisms maintain a balance in their internal environment.	1. 2. 3.
have a UNIVERSAL GENETIC CODE (Heredity)	All life has DNA, which carries a code or instructions for making living things. This code is the same for ALL life.	Prokaryotes and Eukaryotes the same code but are arranged in different shapes. Identify the shape of the DNA for Prokaryotes and Eukaryotes.	Prokaryotes: Eukaryotes:
REPRODUCE either sexually or asexually	When an organism is able to create an offspring, or like organism of the same species.	Explain two types of reproduction.	Sexual: Asexual:
GROW & DEVELOP through a life cycle	The instructions for the growth & development of organisms is found within its DNA.	Chose any living organism and provide it's stages of growth and develop (life cycle stages)	Organism: Stages of Life:
EVOLVE through adaptations	The ability of a species of organism to survive as the result of a change in genetic information.	Identify what is meant by high fitness and low fitness of an organism.	High Fitness: Low Fitness:

Assignment #2 — put this page in Bio Basics Section of Notebook

Macromolecule Chart –

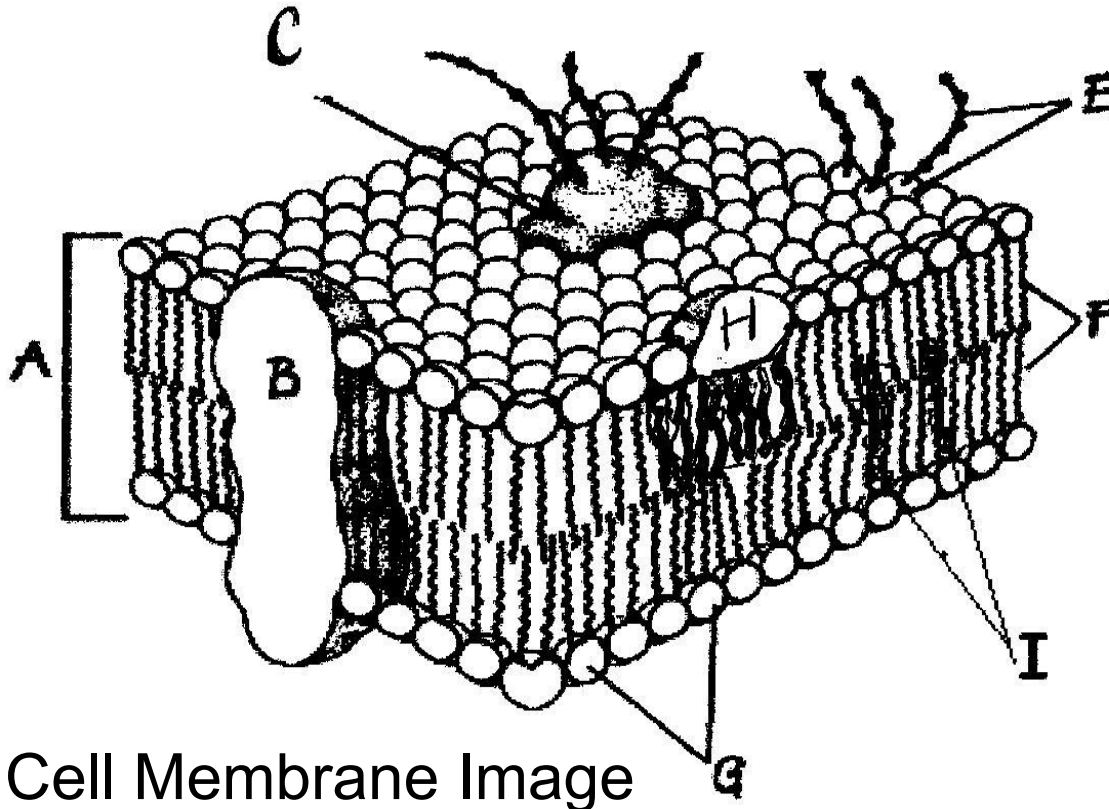
Copy or print this chart in your notebook & then use the resource videos provided on the checklist slide to complete it.

Macromolecule	Elements that make it up	Function or Job	Building Block (monomer)	Chemical Structure
Carbohydrates	Carbon, Hydrogen & Oxygen		Simple Sugars	
Lipids		Store Energy & Makes up Cell Membranes	Glycerol + Fatty Acid	
Proteins			Amino Acids	 <p>Amino group</p> <p>Carboxyl (acid) group</p>
Nucleic Acids		Store & Transmit Genetic Information	Nucleotides	

Assignment #3 — put this page in Bio Basics Section of Notebook

Macromolecule Coloring Worksheet —

Copy or print this slide in your notebook & then use the resource videos provided on the checklist slide to complete it.



Cell Membrane Image

Use the names of cell structures below to color & label the cell membrane in the diagram.

- _____ Phospholipid bilayer (no color)
- _____ Transport or integral protein (pink)
- _____ Glycoprotein (yellow)
- _____ Carbohydrate (green)
- _____ Hydrophobic tails (orange)
- _____ Hydrophilic heads (red)
- _____ Membrane protein (purple)
- _____ Cholesterol (blue)

Based on the information from assignment#2 chart, match the cell structure with its function. Write the letter of the structure next to its function (may be used more than once).

- _____ Attracts water
- _____ Repels water
- _____ Helps maintain flexibility
- _____ Makes up the bilayer
- _____ Involved in cell-to-cell recognition
- _____ Helps transport materials (such as glucose) across the cell membrane