

Name \_\_\_\_\_

## AP Biology Summer Assignment

The AP curriculum is extensive and summer work is necessary toward a successful year. It is assumed that AP students are self-motivated and disciplined enough to undertake independent studies during the summer. You need to plan ahead and allot enough time to complete the following assignment. It is unrealistic to expect that you will be able to complete this work if you wait until the last minute.

You will be responsible for mastery of the topic and **you should bring your completed assignment with you for our first class meeting in August.**

If you have any questions please contact one of us:

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**Broad objective:** You will be researching classification and evolutionary relationships between the three broad domains (Archaea, Bacteria, and Eukarya) as well as some of the smaller groupings of organisms within those domains.

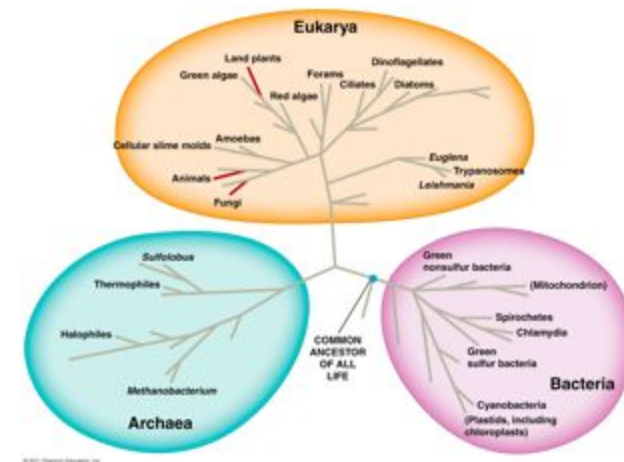
### The purposes of this project are:

- To prepare you for tests and quizzes we will take over classification, phylogeny, and plant and animal physiology.
- To provide you with a quick reference over the domains, kingdoms and phyla that you can use in future biology courses.
- To provide foundational knowledge and a reference for our study of ecology, evolution, phylogeny, and molecular genetics.

### After completing this project, you should be able to:

- Identify the three domains, kingdoms, and representative phyla used to classify all organisms on Earth.
- Describe the main characteristics of these groupings and provide examples of each.
- Identify divergent events that led to the development of these groupings.
- Identify major phyla within each of the main groupings of organisms as well as their main characteristics.

**Part One:** Use your textbook to answer the following questions. Be sure to write all your answers in your own words. If you reference any sources other than your textbook, they should be cited using APA citation format. There are many APA citation generators on the web that can help you compile your list of references. Your textbook should be your primary reference for Part One of this assignment. Your responses to part one of this assignment must be **handwritten**. You will lose credit if this portion is typed. All work for this assignment should be your own. You **may not** collaborate with other students on this assignment.



**Chapter 26: The Phylogeny and the Tree of Life.**

1. Identify the major taxonomic categories used to organize life.
2. How are phylogenies created and what do they illustrate? What lines of evidence are used by scientists to construct a phylogeny?
3. Why do some scientists think that the tree of life is really more like a “ring” or a “web”? What evidence do they use to make that conclusion?
4. Fill in the table below.

	<b>Major defining characteristics (at least 3)</b>	<b>Examples of organisms in the domain (<i>Genus species</i> &amp; description)</b>
Domain Eubacteria		
Domain Archaea		
Domain Eukarya		

## Chapter 27: Bacteria and Archaea

5. What are the structures that define the group of organisms known as prokaryotes?
6. Prokaryotic cells reproduce through binary fission. What is binary fission?
7. What are the main mechanisms that prokaryotic cells use to exchange genetic information? How do those mechanisms and mutation contribute to genetic diversity in prokaryotes?

## Chapter 28: Protists

8. What is endosymbiosis and how did it contribute to the evolution of eukaryotic cells? Draw a picture illustrating the process of endosymbiosis.
9. What characterizes the group of organisms known as protists? Why are protists no longer considered to be a true kingdom?
10. Choose two of the protists supergroups listed on p 578-579 of your textbook and fill in the table below.

<b>Protist Supergroup</b>	<b>Mode of Nutrition</b>	<b>Presence or Absence of a Cell Wall</b>	<b>Reproduction</b>	<b>Examples &amp; other notable characteristics</b>

**Chapter 29: Plant Diversity I: How Plants Colonized Land**

11. Describe the evidence that land plants evolved from green algae called charophytes.

12. Fill in the table below for the main lineages of land plants.

<b>Plant Group</b>	<b>Vascular System</b>	<b>Reproduction</b>	<b>Examples &amp; other notable characteristics (<i>Genus species &amp; description</i>)</b>
Bryophytes			
Seedless Vascular Plants			
Gymnosperms			
Angiosperms			

## Chapter 30: Plant Diversity II: The Evolution of Seed Plants

13. Fill in the table below describing major plant adaptations to life on land.

Maintaining Moisture	
Obtaining Resources from Soil & Air	
Supporting Plant Body	
Reproduction & Dispersal	

## Chapter 31: Fungi

14. Your book outlines the key roles that fungi play in nutrient cycling and ecological interactions. Provide examples from your text of fungi's role as decomposers, mutualists, and pathogens. Be sure to include the function of mycorrhizal association as part of your response.

15. Fungi are heterotrophs that feed by absorption. What does this mean and what structures of fungi make this possible?

**Chapter 32-34: An Introduction to Animal Diversity, Invertebrates & Vertebrates**

16. Define the following terms:

Coelom:

Segmentation:

Exoskeleton:

Endoskeleton:

Amniotic egg:

Radial symmetry:

Bilateral symmetry:

Notochord:

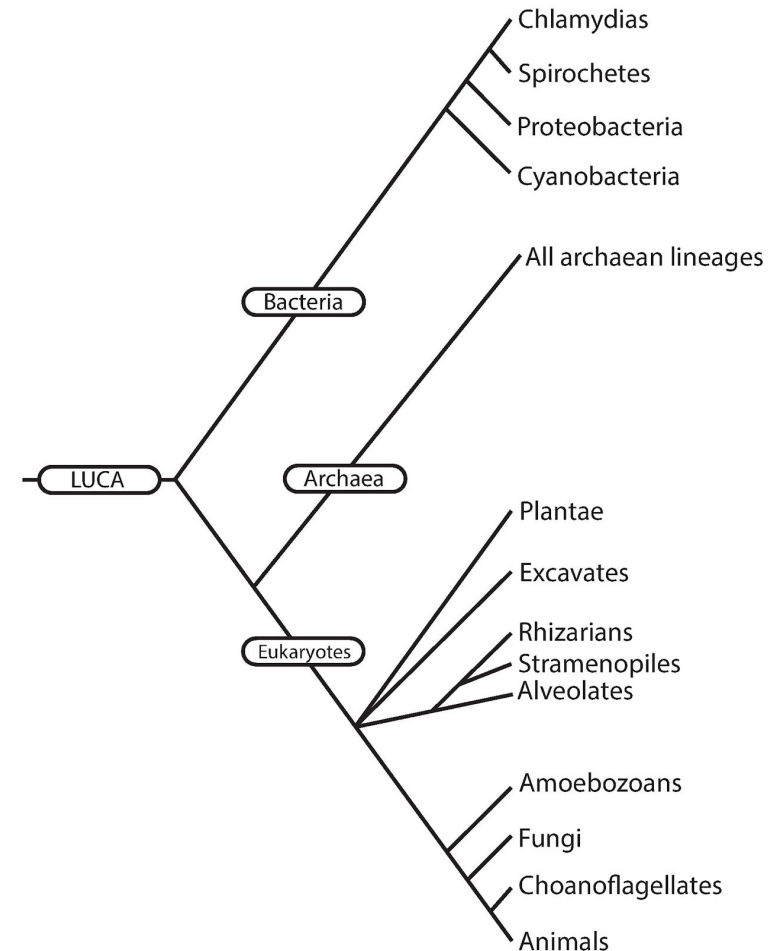
17. Fill in the table below outlining the key characteristics of the Kingdom Animalia.

<b>Animal Group</b>	<b>Type of Symmetry</b>	<b>Presence of a Coelom</b>	<b>Presence of Segmentation</b>	<b>Soft Body, exoskeleton, or endoskeleton</b>	<b>Other notable characteristics</b>	<b>Examples (<i>Genus species</i>)</b>
Porifera						
Cnidaria						
Platyhelminthes						
Nematoda						
Mollusca						
Annelida						
Arthropoda						
Echinodermata						
Chordata						

## Making Sense

18. The image to the right represents one way to view the tree of life. LUCA is the last universal common ancestor of all life on the planet.

- Identify at least three characteristics that were likely present in the common ancestor of all life (LUCA).
- All phylogenetic trees illustrate theoretical relationships between organisms based on multiple lines of evidence. Taxonomic organizations have also changed dramatically over time as new evidence is gathered. Why is it challenging to group organisms and why do groupings change over time?
- On the tree to the right, fill in the locations of at least 5 traits that define these clades of organisms (derived traits). Describe the traits you chose in the space below.



19. How has this activity improved your understanding of the diversity of life? Be thorough and specific in your response.



**Part Two:** Choose one organism that you identified above from each of the following categories: Archaea, Bacteria, Protists, Plants, Fungi, Invertebrates, Vertebrates (7 in total). This portion of the assignment must also be **handwritten** (all work written on the back of your image). All work for this assignment should be your own. You **may not** collaborate with other students on this assignment.

- Find and print out an image of each of your organisms. Your image should be at least half a sheet of paper in size. Use a sharpie to label each with the organism's binomial nomenclature on the front of the picture.
- Handwrite a short description of your organism on the back of the image using the template below.

The following information must be handwritten on the back of each of your 7 pictures.

<i>Genus species</i>
General Description
Habitat
Mode of Reproduction
Locomotion
Additional memorable identifying details
If Applicable
- Digestion
- Respiration
- Nervous Control
Animals
- Symmetry
- Segmentation
- Skeleton type
- Appendages

Create a reference sheet in a Google Doc where you identify the source of each image by listing the *Genus species* - website.