

**A. Scientific Method and Cells**

1. How to conduct a controlled experiment
2. Scientific variables
3. Compare prokaryotic vs eukaryotic cells
4. Characteristics of life
5. Explain the four groups of biological molecules
6. Describe the functions of cell organelles
7. Draw and explain isotonic, hypertonic and hypotonic solutions
8. Compare and contrast mitosis and meiosis

**B. Adaptation and Evolution**

9. Describe the basic structure of DNA.
10. Identify the roles of DNA in evolution.
11. Explain the role of sexual reproduction in variation and evolution.
12. Describe the process of natural selection.
13. Differentiate among and give examples of convergence, divergence and coevolution.
14. Compare and contrast the gradual change model with the punctuated equilibrium model of evolution.
15. Identify the role of extinction in evolution.
16. Identify lines of evidence for Evolution.
17. Compare Lamarck to Darwin.
18. Describe how the peppered moth demonstrates evolution occurring.
19. Outline the main points of the Theory of Natural Selection.
20. Explain different ways to change a gene pool.
21. Draw graphs and explain 3 types of selection.

**C. Taxonomy/Classification**

1. What is taxonomy?
2. What is Binomial nomenclature?
3. List the Levels of classification.
4. What are the 6 kingdoms?
5. Describe the main points of each kingdom.

**D. Viruses**

1. Why are viruses considered to be non-living?
2. Describe the basic structure of viruses.
3. Describe viral diversity – enveloped, retro etc
4. What evidence is used to classify viruses as living or non-living.
5. Compare and contrast the lytic and lysogenic cycles.
6. Describe the body's basic lines of defense against a viral attack.
7. Give examples of ways to reduce the chance of contacting a viral disease.
8. Viruses and human health – describe vaccines

**E. Prokaryotes: Microbiology**

1. Describe the basic structure of a prokaryotic cell.
2. List examples of organisms that are prokaryotic and describe characteristics that unify them.
3. Explain 3 processes by which bacteria adapt (by horizontal gene transfer) to become resistant to antibiotics.
4. Explain why you should finish your antibiotic prescription.
5. Give examples of the beneficial roles of bacteria.
6. The three types of bacteria.
7. Describe the reproductive strategies of bacteria
8. How are plasmids and F-factors related to the spread of antibacterial resistance?

**F. Kingdom Plantae**

1. Describe characteristics that unify all plants.
2. Describe the characteristics of green, brown and red algae.
3. What is the evolutionary trend in plants?
4. Explain the life cycles of Bryophyta and Pteridophyta.
5. Describe the ecological role of aquatic, terrestrial, algae, and vascular plants.
6. Describe the characteristics that unify gymnosperms.
7. Explain how gymnosperms are adapted for survival in a land environment with respect to the following: needles, seeds, pollen, vascular tissue.
8. Examine angiosperms and describe characteristics that unify them.
9. Compare and contrast the ways in which angiosperms and gymnosperms have adapted to a land environment.
10. Differentiate between monocots and dicots.
11. Identify the organs of plants and how movement of water and nutrients occurs.
12. What is the role of pollinators in reproduction?

## **Kingdom Animalia**

**BE SURE THAT YOU ARE VERY COMFORTABLE WITH THE ANIMALIA CHART THAT YOU FILLED OUT.**

**THIS CHART EMPHASIZES ALL OF THE SYSTEMS IN EACH PHYLUM AND LOOKS AT THE EVOLUTIONARY TRENDS.**

### **G. Kingdom Animalia (porifera, cnidaria)**

1. Examine members of the Phylum Porifera and Phylum Cnidaria and describe characteristics that unify each.
2. Explain the process of filter feeding in a sponge.
3. List the ecological roles of sponges and cnidarians.
4. Compare and contrast polyp and medusa with respect to structure, general function, and motility.
5. Explain the evolutionary significance of multicellular (cnidarian) versus colonial (poriferan) life forms.

### **H. Kingdom Animalia (platyhelminthes, nematoda, annelida):**

1. Describe characteristics that unify members of the Phylum Platyhelminthes, Phylum Nematoda, and Phylum Annelida.
2. Contrast the structural features of platyhelminthes, nematodes, and annelids.
3. Examine and explain physical changes that were necessary for flatworms to become parasitic.
4. What are the ecological roles of the platyhelminthes, nematodes, and annelids?
5. What are the characteristics of a successful parasite?
6. Compare platyhelminthes, nematodes, and annelids with respect to evolutionary changes.
7. What are some human disorders that are caused by non-segmented nematodes?

### **I. Kingdom Animalia (Mollusca)**

1. Describe characteristics that unify the members of the Phylum Mollusca.
2. Compare and contrast members of two or more classes of mollusks.
3. List some of the adaptations of mollusks.
4. What are some of the ecological roles of mollusks?

### **J. Kingdom Animalia (Arthropoda):**

1. Describe the characteristics that unify the Phylum Arthropoda.
2. Compare and contrast members of two or more classes of arthropods.
3. Demonstrate knowledge of the adaptations of arthropods to a terrestrial environment.
4. What adaptations have allowed arthropods to become so successful?