**Laboratory 1: SYSTEMATICS, TAXONOMY & PHYLOGENY: CLASSIFYING AND NAMING ORGANISMS**

*After completion of this laboratory session, and with 70% accuracy on the first laboratory quiz, the student should be able to:*

1. List the taxonomic levels from the broadest to the most specific.
2. Explain the degree of similarity and difference between organisms classified in a taxonomic table.
3. Identify animals/plants through the use of a dichotomous key.
4. Develop a dichotomous key to distinguish geometric figures and/or classmates and/or beans given specific characters
5. Understand phylogeny and the tools used to study the evolutionary history of organisms
6. Answer the review questions at the end of the exercises

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**Laboratory 2: INTRODUCTION TO MICROBIOLOGY: DOMAINS ARCHAEA, BACTERIA AND KINGDOM PROTISTA**

*After completion of this laboratory session, and with 70% accuracy on the first laboratory quiz, the student should be able to:*

1. Describe the distinguishing features of members of the Archaea and Bacteria domains
2. Explain how bacteria are characterized
3. Describe differences between bacteria and cyanobacteria
4. Explain and contrast binary fission and conjugation
5. Discuss the distinctive features of each group of algae and protozoans
6. Understand the economic importance of algae
7. List examples, habitats, reproductive methods, and unique features of the phyla of Kingdom Protista
8. Answer the review questions at the end of the exercises

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**Laboratory 3: MYCOLOGY: KINGDOM FUNGI**

*After completion of this laboratory session, and with 70% accuracy on the first laboratory quiz, the student should be able to:*

1. Describe the characteristic features of Kingdom Fungi
2. Explain the division names: Chytridiomycota, Zygomycota, Ascomycota, Basidiomycota, AM Fungi
3. Discuss variations in structure, asexual reproduction and the sequence of events for sexual reproduction for three major divisions of Kingdom Fungi (Zygomycota, Ascomycota, Basidiomycota)
4. Answer the review questions at the end of the exercises

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**Laboratory 4: BOTANY PART 1: KINGDOM PLANTAE – SEEDLESS PLANTS: BRYOPHYTES, FERNS**

*After completion of this laboratory session, and with 70% accuracy on the first laboratory quiz, the student should be able to:*

1. Describe the characteristic features of Kingdom Plantae and their adaptations to land
2. Understand the alternation of generations and 4 groups of plants
3. Describe the life histories and related reproductive structures of mosses and liverworts
4. Discuss similarities and differences between ferns and bryophytes
5. Describe the life cycles of ferns and their allies
6. Answer the review questions at the end of the exercises

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 **Laboratory 5: BOTANY PART 2: KINGDOM PLANTAE – GYMNOSPERMS AND ANGIOSPERMS. PLANT FORM AND FUNCTION .**

*After completion of this laboratory session, and with 70% accuracy on the first laboratory quiz, the student should be able to:*

1. Describe the distinguishing features of gymnosperms
2. Understand the life cycle of a pine
3. Explain the major evolutionary advances of the gymnosperms over the ferns
4. Understand some adaptations of evergreens to cold, dry environments
5. Identify the parts and understand the function of a cone
6. Identify the parts and understand the function of a seed
7. Describe the life cycle of angiosperms (flowering plants)
8. List and give the functions of the principal parts of a flower
9. Describe the events associated with the development of microspores, megaspores, seed, endosperm and fruits in angiosperms
10. Describe the structure and function of roots, stems, and leaves.
11. Know and list the differences between monocots and eudicots
12. Answer the review questions at the end of the exercises.

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| **Live/ Fresh Specimen observed/dissected** | **Domain** | **Kingdom** | **Phylum/Group** | **Lab** |
| Cyanobacteria | Bacteria |  |  | 2 |
| Paramecia | Eukarya | Protists |  | 2 |
| Amoeba | Eukarya | Protists |  | 2 |
| Euglena | Eukarya | Protists |  | 2 |
| Penicillium | Eukarya | Fungi | Ascomycota | 3 |
| Rhizopus | Eukarya | Fungi | Zygomycota | 3 |
| Mushroom | Eukarya | Fungi | Basidiomycota | 3 |
| Yeasts | Eukarya | Fungi | Ascomycota | 3 |
| Various seed cones | Eukarya | Plants | Gymnosperms | 5 |
| Lilly flowers | Eukarya | Plants | Angiosperms | 5 |
| Green beans | Eukarya | Plants | Angiosperms | 5 |
| Sprouted corn | Eukarya | Plants | Angiosperms | 5 |
| Sprouted Lima beans | Eukarya | Plants | Angiosperms | 5 |

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