Unit Four **Classification Notes**

I. Taxa:

Domain

ain Kingdom Phylum Class

Order

Family

Genus

species

II. I nree Domain - Six Kingdom Syster
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Domains	Bacteria	Archaea	Eukarya			
Characteristic	Bacteria	Archeobacteria	Protista	Fungi	Plantae	Animalia
Cell Type	Prokaryotic	Prokaryotic	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell Number	Single to Colonial	Single to colonial	Single to Colonial	Single to Multicellular	Multicellular	Multicellular
Cell Wall Composition	Polysaccharide (Non Cellulose with Peptides)		Some have Cellulose cell walls	Chitin (a Poly saccharide)	Cellulose	No cell walls
Food Storage	Some have starch, others glycogen		Some have starch, others glycogen, and oils	Glycogen	Starch	Glycogen
Nutritional Types	Chemosynthetic Photosynthetic Parasitic Saprotrophic	Chemosynthetic Halophiles Thermophiles	Photosynthetic Parasitic Holotrophic	Saprotrophic Parasitic	Photo synthetic Parasitic	Holotrophic Parasitic
Size	Microscopic cells, Colonies often visible	Microscopic cells, Colonies often visible	Microscopic to just visible	Microscopic to several centimeters	Small to several meters	Microscopic to several meters



III. Kingdom Survey



Origin of organelles

- 1.Prokaryotic
- 2. No membrane bound organelles
- 3. Contains bacteria, cyanobacteria, viruses and other infective agents.
- 4. Bacterial shapes: cocci, spirillum, and bacillus



5. Viruses: Bacterial phage see above.

B. Protista



b: Flagellates: ex Euglena, Gymnodinium



c: Sarcodines: Ex. Amoeba; Endamoeba histolytica



d. Sporozoans: Ex. Malaria



2. Diatoms

The golden brown algae. Have silica shells, which are two parts: an epitheca and hypotheca. Together they make up the frustule.



Pinnate



- 1. Hypha, mycelium
- 2. Spore, sporangium. sporangiophore
- 3. Sac Fungi, Aspergillus, yeast
- 4. Club Fungi, Mushroom
- 5. Fungi imperfecti ringworm, athletes' foot
- 6. Slime molds
- 7. Lichen



D. Kingdom Plantae



2. **Bryophyta** - gametophyte dominant Mosses Liverworts antheridium

archegonium

thallus rhizoid Sporophyte Antheridium Antheridium Rhizoids



Angiosperms (seed plant) know life cycle





E. Kingdom Animalia

- 1. General Characteristics
 - a. Body Symmetry
 - 1. Asymmetry 2. Radial

 - 3. Bilateral



Mesoderm

Gastrocoel

Ectoderm

Terms: Anterior Posterior Dorsal Ventral Lateral Oral Aboral

b. Germ Cell Layers

- 1. No Germ Layers
- 2. Two Germ Layers
- 3. Three Germ Layers

c. Coelom Formation

- 1. Acoelomate
 - 2. Pseudocoelomate
 - 3. Eucoelomate

d. Nervous System

- 1. None
- 2. Peripheral "nerve Net"
- 3. Centralized
- 4. Brain Formation

e. Digestive System

- 1. no system -Protozoan
- 2. Gastrovascular "Blind Sac"
- 3. Complete



f. Segmentation - from simple repetitive segments to Regional specialization

Endoderm

11. Phyla Survey

a. Phylum Porifera





Stinging Cell



c. Phylum Platyhelminthes

- 1. Bilateral Symmetry
- 2. Gastrovascular
- 3. Three Germ Layers
- 4. Dorsal ventrally flattened
- 5. Acoelomate
- 6. Centralized Nervous System
- 7. Excretory system with

Flame Cells

Free living flatworms

Flukes

Tapeworms



d. Phylum Nematoda

- 1. Complete Digestive Tract
- 2. Pseudocoelomate



e. Phylum Mollusca

- 1. Soft Unsegmented Body
- 2. Mantle secrets the Shell
- 3. Shell in 0, 1, 2, 3, or 8 parts
- 4.Radula









Squid

f. Phylum Annelida

- 1. Segmentation
- 2. Lateral appendages
- 3. Parapoda

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Polychaetes
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Oligochaetes

Leaches



Arthropod Line

g. Phylum Arthropoda

1. Body composed of body regions: head, thorax (cephlothorax) and abdomen.

- 2. Exoskeleton chitinous
- 3. Molting
- 4. Compound Eye
- 5. Striated Muscle
- 6. Jointed Appendages
 - Centipeds
 - Arachnids
 - Crustacea
 - Insects





- 1. Radial Symmetry, Pentramerous (five part)
- 2. Endoskeleton of calcareous plates
- 3. No head or segmentation
- 4. Water Vascular System
 - Madroporite sieve plate

Ampulla - muscular water filled sacs

Podium - tube foot

Ambulacral groove - groove containing the radial canal

Stone Canal- Short calcified tube linking madroporite with ring canal.

Ring Canal - Distribution ring linking the five major radial canals

Radial Canals - going outward from the ring canal.

j. Vertebrates

appendage -fins, limbs support - lateral, ventral body covering- none, scales, feathers, hair



1. Fishes

Fins: dorsal, anal, pectoral, pelvic, caudal Jaws, scales



2. Amphibians

dual lives moist skin eggs laid in water poor land support



3. Reptiles

First land egg Dry scaly skin Gave rise to mammals and birds Lateral support



4. Birds

Retention of land egg Ventral Support Flight Precocial altricial



5.Mammals

Hair Mammillary glands Monotremes Marsupials Placentals



Review Questions:

1. What are the three basic shapes of bacteria?

2. Describe a virus.

- 3. What is a phage?
- 4. What is interferon?
- 5. The earliest organisms were most like what present day organisms?
- 6. Name a photosynthetic Moneran looking like an alga.
- 7. Prokaryotic means what?
- 8. In order to identify bacteria down to species, you must consider what about them?
- 9. What do holotrophic, saprophytic, and chemosynthetic mean?
- 10. Name the domains of the following: thermophiles, blue-green algae and liverworts.
- 11. How are the various classes of the Protozoa classified?
- 12. What are the groups of the following: Endamoeba, Paramecium, and Gymnodinium?
- 13. What is a pseudopod?
- 14. What cells distinguish the Tracheophytes from the Bryophytes?
- 15. What is a slime mold?
- 16. What is a lichen?
- 17. Define the following terms: sporangium, antheridium, archegonium, and gametophyte.
- 18. Know the life cycle diagram of the liverwort.
- 19. Know the diagram of the generalized sporophyte and gametophyte life cycle.
- 20. What is the difference between a spore and a gamete?
- 21. Know the life cycle diagram of the fern.
- 22. Where does meiosis and mitosis occur in the generalized life cycle of the plant?
- 23.Know the diagram of the flower.

24. Where is the gametophyte stage in the flower anatomy?

25. Know the different types of coelom formations (diagram).

26. Know what each cell layer is called (ectoderm, endoderm, mesoderm) and what tissues they form.

27. Be able to label an unlabeled Kingdom diagram of the Animalia.

28. Associate the following with their phyla: collar cells, madroporite, flame cells, cnidocytes,

podia, medusae, porocyte, amebocyte and a choanocyte.

29. Know how many germ layers each phylum has.

30. Know the kind of symmetry each phylum demonstrates

31. Know the following terms: hyphal strand, mycelium, sporangiophore and sporangium

32. How are the Fungi classified?

33. How are the tissues formed in Fungi and how is it different from the Plantae?

34. What are the differences in cell wall composition and food storage sugars between the Fungi and the Plantae?

35.What is a pinnae?

36. What is a fiddle neck?

37. What features in plants allowed for a growth in height?

38. Oral and aboral are associated with what kind of symmetry?

39.Can an organism has radial symmetry and a brain?

40. What is the function of the collar cells?

41. What was the first animal to show a complete digestive tract (refer to the Kingdom tree)?

42. What was the first animal to show bilateral symmetry?

- 43. What is the function of a flame cell?
- 44. What phylum has no true tissues (therefore no germ layers)?
- 45.What is the first phylum to have three germ layers?
- 46. Can you have two germ layers and a coelom?
- 47. What is the evolutionary sequence of support in vertebrates?
- 48. What animal group was the first to develop a protective skin for land invasion?
- 49. Mammals and birds are derived from what animal group?
- 50. Name the three main mammals groups and method of reproduction.
- 51. What is the digestive system with only one opening?
- 52. What animal group developed the first land egg?