**Biology End of Course Review**

Based on the Arkansas frameworks for Biology

**Semester I**

**Scientific Method** (Ch 1)

What makes for good scientific data?

 What are the steps to the most basic scientific method?

 How is something accepted as science?

**Define:**

Hypothesis

 Theory

**Major Organic Molecules and their Functions in Life** (Ch 2)

 **Lipids**

Examples:

 Functions:

 Characteristics:

 **Carbohydrates**

Examples:

 Functions:

 Characteristics:

 **Nucleic Acids**

Examples:

 Functions:

 Characteristics:

 **Proteins**

Examples:

 Functions:

 Characteristics:

**Enzymes**

How do they work?

 What is activation energy?

**Reactions:**

Exergonic Reactions:

 Endergonic Reactions:

**Water**

Molecular Formula:

 Type of bonds between water molecules?

 **Properties Important to Life:**

Cohesion

 Adhesion

 Surface Tension

 Polarity

**Ecosystems**

 What are factors that affect the size of a population?

**Give Examples:**

Biotic:

 Abiotic:

**Describe the following Cycles:** (Ch 3)

Carbon Cycle:

 Nitrogen Cycle:

 Water Cycle:

**Define/Give Examples:**

Food Chain

 Food Web

 Energy Pyramid

**Levels of Ecology:**

What are the five levels of ecological organization?

**Types of Symbiosis (Define and Give Examples):** (Ch 4)

 Commensalism Mutualism Parasitism

**Compare and contrast:** Primary Succession Secondary Succession

**What are the five levels of biological organization within an organism?** (Ch 7)

**What are the major differences between Prokaryotes and Eukaryotes? (Name at least 2)**

**Cell Structures and Functions:**

 **What is the function of each of the following organelles:**

Nucleus:

 Endoplasmic Reticulum:

 Ribosomes:

 Golgi Apparatus:

 Mitochondria:

 Chloroplast:

Cytoskeleton:

 Cell Membrane:

 Cell Wall:

 **What are the main differences between plant and animal cells (Compare & Contrast):**

Animal:

 Plant:

**Define and Give Examples:**

Autotroph:

 Heterotroph:

**Define and Give Examples: (Endocytosis, Exocytosis, Diffusion, Osmosis)**

Active Transport:

 Passive Transport:

**Cell Cycle: (I P on a MAT you C) (Describe what is occurring in each phase and draw it to the right)** (Ch 10)

Interphase ( G1, S phase, G2)

 Prophase

 Metaphase

 Anaphase

 Telophase

 Cytokinesis

**Define and Compare:** (Ch 10 & 11)

Mitosis:

 Meiosis:

**Define Homeostasis:**

Example in Human Body:

**Define:**

 **Aerobic Respiration**: (Ch 9)

 Glycolysis:

 Krebs Cycle (Citric Acid Cycle):

 Electron Transport Chain:

 **Anaerobic Respiration**:

 What is the product acquired by cells by doing each of the above processes?

 What are the two types of fermentation observed in living things?

 **Photosynthesis:** (Ch 8)

What is the product acquired by cells through photosynthesis?

 Why is sunlight needed for a plant to stay alive?

 **Define:**

Light Dependent Reactions

 Light Independent Reactions

**What is significant about the work of Gregor Mendel?** (Ch 11)

**What are the Laws of Probability?**

**What is a Punnett Square?**

**Complete the following crosses using a Punnett Square and list the genotype and phenotype ratios:**

TT x tt

 Tt x Tt

(T = Tall, t = short)

**Define and give examples for the following modes of inheritance:**

 **Complete Dominance:**

 **Codominance:**

 **Incomplete Dominance:**

 **Sex-Linked:**

**What is a Karyotype and how is it used?** (Ch 14)

**Describe how a human karyotype should appear:**

**Compare Monosomy and Trisomy:**

**Compare and Contrast:** (Ch 12)

DNA

 RNA

**What are the rules for DNA nitrogenous base pairing?**

**Describe the steps in Protein Synthesis: (Remember: DNA -> mRNA -> Protein)**

Transcription

 Translation

**What are the major types of mutation events?**

**Semester II**

**Compare the following:** (Ch 15)

Lamarck’s theory of Evolution:

 Darwin’s theory of Evolution:

**Why was Lamarck’s theory wrong?**

**What is the mechanism for evolution?**

**What evidences support the fact that living things have evolved on Earth? (Name at least 4)** (Ch 15-17)

**Define:** (Ch 17)

Relative Dating:

 Radioactive Dating:

**Draw a Cladogram for the major plant phyla:** (Ch 18 & 22)

**List the categories of taxonomy starting with the broadest and ending with the most specific:** (Ch 18)

**List the characteristics of each Domain:**

Bacteria:

 Archaea:

 Eukarya:

**Describe Binomial Nomenclature and write an example:**

**What is the Cell Theory?** (Ch 7)

**Why are Viruses not considered living by most biologists?** (Ch 19)

**What are the six kingdoms of living things?** (Ch 18)

**What are characteristics of Bacteria?** (Ch 19)

How are bacteria classified?

 What are the defining characteristics of the two bacterial kingdoms?

 Eubacteria:

 Archaebacteria:

 Give an example of a common bacterial species:

 Where are bacteria found?

 What is an ecologically important role of bacteria?

**What are characteristics of Protists?** (Ch 20)

How are protists classified?

 What are the defining characteristics of protists?

 Describe the three major groups of protists:

 Animal-Like:

 Plant-Like:

 Fungus-Like:

 Give an example of a common protist:

 Where are protists found?

 What is an ecologically important role of protists?

**What are characteristics of Fungi?** (Ch 21)

How are fungi classified?

 What are the defining characteristics of fungi?

 Describe and give examples of the major groups of fungi:

 Common Molds:

 Sac Fungi:

 Club Fungi:

 Where are fungi found?

 What is an ecologically important role of fungi?

**Reproduction: (Define, Compare, and Give Examples)**

Sexual Reproduction

 Asexual Reproduction

 Metamorphosis

 Alteration of Generations

**What are characteristics of Plants?** (Ch 22 - 25)

How are plants classified?

 What are the defining characteristics of plants?

 Name, describe life cycles, and give examples of the major groups of plants:

 Non-Vascular Seedless:

 Vascular Seedless:

 Seed Plants:

 Flowering Plants:

 What is ecologically important about plants?

 Describe the structure and function of the following major plant parts:

 Roots, Stems, Leaves, Flowers

**Symmetry of Organisms:** (Ch 26)

 **Define and give examples:**

Radial:

 Bilateral:

 Asymmetrical:

**What are characteristics of Animals?**

How are animals classified?

 What are the defining characteristics of animals?

**Describe the two major groups into which animals are classified:**

 Invertebrates

 Vertebrates

**For each Phylum, list defining characteristics including symmetry, subdivisions, and examples:**

 **Invertebrates:**

Porifera (Ch 26)

 Cnidaria

 Platyhelminthes (Ch 27)

 Nematoda

 Annelida

 Mollusca

 Arthropoda (Ch 28)

 Echinodermata

 **Vertebrates: (Chordata)**

Fish (Ch 30)

Amphibians

 Reptiles (Ch 31)

 Birds

 Mammals (Ch 32)