**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)