

Chapters 3**ORGANIZATION OF LIFE and BIOLOGICAL KNOWLEDGE**

OVERVIEW: Our purpose in this assignment is for you to gain a broad overview of the science of biology and the nature of life. Biology seeks to organize knowledge about living systems. Living systems can be considered at different levels of organization. Knowledge of life is organized by specialists at each level.

STRATEGY: First skim Chapter 3 and avoid "getting lost in the trees" because our intent is to "view the whole forest" for an overview of *biology*. Like the first day on the job, you are being introduced to many concepts which we will study in more detail later. Use VOCABULARY below with this in mind.

VOCABULARY: The following list includes some review and some new concepts. Try for a "definition level" knowledge of each. We will revisit them again in later chapters:

Review:levels of organization:

atom
molecule
cell
tissue
organ
organism
population
community
ecosystem
biosphere

Review:What *life has*:

1. hierarchic arrangement
2. specified complexity

What *life does* – “basic life processes”:

1. metabolism
2. reproduction
3. responsiveness
4. homeostasis

New:

classification systems
binomial nomenclature
species
autotroph
heterotroph
fertilization
cell theory
prokaryotic
eukaryotic

LEARNING GOALS: the following statements represent learning goals which, when attained will suggest mastery of the vocabulary and move you toward structural literacy:

1. Use the “Scrabble® Analogy” and other examples in Section 2-E to distinguish *undirected natural causes* from *complexity* and *specified complexity*.
2. Explain how different populations and species can be distinguished? How is this consistent with the account of creation and reproduction in Genesis 1?
3. What are two activities of taxonomic classification? Why is each fraught with difficulty?
4. Name the five kingdoms currently being accepted. What distinguishes each?
5. Explain the concept of a hierarchy and illustrate with reference to Kingdom, Phylum, Class, etc.
6. Check your understanding (perhaps after lecture) using the Text Study Questions, Chapter 3.

STUDY OUTLINE : ORGANIZATION OF LIFE and BIOLOGICAL KNOWLEDGE

PRINCIPLE: BIOLOGY IS AN ORGANIZED BODY OF KNOWLEDGE...WHICH CAN BE STUDIED AT DIFFERENT LEVELS OF A HIERARCHY

- I. BIOLOGICAL CLASSIFICATIONS -- EXIST AT EVERY LEVEL – Table 3-5, page 49.
 - A. BIOSPHERE -- EARTH'S ZONE OF LIFE -- AIR/WATER/LAND
 - > FURTHER CLASSIFIED BY BIOMES = GLOBAL ECOSYSTEMS
 - B. POPULATIONS = interbreeding groups of organisms; two classifications:
 1. ECOLOGICAL CLASSIFICATION = by mode of nutrition
 2. TAXONOMIC CLASSIFICATION = by interbreeding groupings
- II. TAXONOMIC CLASSIFICATION
 - A. PRINCIPLE: organisms exist as distinct _____
 1. CONSISTENT WITH CREATION ACCOUNT -- "after their kind" (Genesis 1)
 2. REPRODUCTIVE BARRIERS – Basis for classification
 - B. PURPOSE -- ORDERLY SYSTEM...OUT OF DIVERSITY by means of two activities:
 1. IDENTIFICATION BY NAME -- interbreeding groups
 2. CLASSIFICATION of similar species into successively larger groups
 - C. IDENTIFICATION BY NAME -- first activity
 1. IMPORTANCE TO SCIENCE:
 2. DIFFICULTY: (a) distinguishing interbreeding groups (b) language barriers since Babel
 3. UNIVERSAL LANGUAGE – BINOMIAL CLASSIFICATION -- Linnaeus (1750)
 - D. CATEGORIZE SIMILAR SPECIES -- second activity
 1. DISTINCTIONS AMONG FIVE KINGDOMS – See Table 3-4 and Internet Sites
 2. DIVISIONS WITHIN EACH KINGDOM – See Table 3-3
- III. INDIVIDUAL ORGANISMS
 - A. SEXUAL DISTINCTIONS -- division of labor between male and female
 - B. DEVELOPMENTAL STAGES
- IV. SEE TABLE 3-5 FOR CLASSIFICATIONS AT LOWER LEVELS OF ORGANIZATION

INSTRUCTIONS: Select the correct choice in response to each question and, in the correspondingly numbered box near the bottom of the quiz, write the UPPER CASE letter of the correct choice. Do NOT score your answers by circling or otherwise making marks on the letters of the individual choices. Otherwise, you may write on the quiz if it helps your thinking process. **You should have this quiz completed and ready to hand in when requested during lecture either on or after the date of the assignment to which this quiz is attached. You may complete the quiz alone or work with others, but be sure you are mentally involved in answering the questions. You must be present on the day the quiz is requested to receive credit.**

- Which of the following taxonomic groups would contain organisms that are most similar in anatomy and behavior.
A. Class B. Order C. Genus D. Phylum E. Family
- According to the text and our discussion in class, both religious and scientific ways of "knowing" are based upon
A. instinct
B. observation
C. subjective truth
D. scientific method
E. faith presuppositions
- The most immediate result of inductive reasoning on the part of a biologist is
A. a theory.
B. a hypothesis.
C. a design for an experiment.
D. an attitude of pride and overconfidence.
E. a statement that reflects reasoning from the general to the more specific.
- Which of the following represents an arrangement of parts or a system that is most likely to have the conditions sufficient to be considered *specified complexity*?
A. LYGBOIO B. BIOLOGY C. rock cliff D. 132489265 E. sounds of a rippling brook
- Which of the following levels of biological organization is the most all-inclusive (comprehensive)?
A. Cell B. Molecule C. Organism D. Population E. Organelle

Score Answers Here -->	1.	2.	3.	4.	5.
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- If you and a friend entered a heated discussion in which you disagreed on the "origin of life", how would you express your position in such a way as to help your friend see why the two of you disagree? Answer in one well written statement below.
