

GENERAL BIOLOGY Lecture 2 - What is life?

**I. Levels of organization**

- |           |                           |           |                               |
|-----------|---------------------------|-----------|-------------------------------|
| <b>A.</b> | <b>Subatomic particle</b> | <b>H.</b> | <b>Organ</b>                  |
| <b>B.</b> | <b>Atom</b>               | <b>I.</b> | <b>Organ system</b>           |
| <b>C.</b> | <b>Molecule</b>           | <b>J.</b> | <b>Multicellular organism</b> |
| <b>D.</b> | <b>Protein (enzyme)</b>   | <b>K.</b> | <b>Population</b>             |
| <b>E.</b> | <b>Organelle</b>          | <b>L.</b> | <b>Community</b>              |
| <b>F.</b> | <b>Cell</b>               | <b>M.</b> | <b>Ecosystem (Biome)</b>      |
| <b>G.</b> | <b>Tissue</b>             | <b>N.</b> | <b>Biosphere</b>              |

**SAM POCTOOMP Can Eat (Big) Bananas**

**II. What is life?**

- A. Rock vs frog (easy); bacterium vs virus (more difficult)**
- B. Distinguishing between living and non-living**
  - 1. Energy transfer**
    - a) Summation of a cell's chemical processes : metabolism**
  - 2. Growth**
  - 3. Response to stimuli**
  - 4. Movement**
  - 5. Reproduction (DNA)**
- C. Definition of life: THE SUM PROPERTIES OF METABOLISM, GROWTH, IRRITABILITY, MOVEMENT, AND REPRODUCTION**
  - 1. Smallest unit of life that can exist as a separate entity: A CELL**

**III. Uniformity of life**

- A. Metabolism**
  - 1. Photosynthesis (Plantae, Protista, Monera\*)**
  - 2. Respiration (Animalia, Plantae, Fungi, Protista, Monera\*)**
  - 3. Other metabolism**
  - 4. Energy (ultimately ATP) for:**
    - a) Growth**
    - b) Development**
    - c) Reproduction**
- B. Homeostasis - ability to maintain an internal environment**
- C. Inheritance**
  - 1. DNA**
    - a) Transmission from parent to offspring**
    - b) Spontaneous mutations**
    - c) Adaptation to environment**
    - d) Survival of the fittest**

**IV. Diversity of life**

- A. Variation**
  - 1. Form**
  - 2. Function**
  - 3. Behavior**

*\*The Kingdom Monera, under the new classification scheme, has been divided into the Kingdoms Archaeobacteria and Eubacteria*