

## **I. Living Things**

### **A. Features of life (living Organisms)**

- 1. Definite size & shape (Grow)**
- 2. Reproduce**
- 3. Metabolism (Use Energy)**
- 4. Move**
- 5. Respond to environment (stimulus)**
- 6. Made of cells**
- 7. Definite Life span**

### **B. All living things have levels of organization**

- 1. Cells make tissues**
- 2. Tissues make organs**
- 3. Organs make systems**
- 4. Systems together make complex organisms**
- 5. There can be organisms at any level**

### **C. Reproduction**

- 1. Like produces like**

### **D. Adaptation - any characteristic an organism has that makes them better able to survive their surroundings.**

- 1. Homeostasis - regulation of an organism's internal environment to maintain conditions that allow it to live**

### **E. Growth & development**

- 1. Growth - getting larger**
- 2. Development - Changes that take place in an organism as it grows**

### **F. Living things need energy**

- 1. Energy is the ability to do work and cause motion**

### **G. Water, oxygen and minerals - important part of all living things**

## **II. Where life comes from**

### **A. Spontaneous Generation - People once believed that living could come from nonliving.**

### **B. 1668 Francesco Redi did an experiment with rotting meat and proved that maggots came from flies**

### **C. 1790 Spallazani did an experiment that he thought proved that tiny organisms come from air**

### **D. 1860 Louis Pasteur proved living things do not come from nonliving things**

1. The result is the theory of Biogenesis – “At this present time all living things come from other living things.”

E. Where did life originate

1. Oparian’s Hypothesis p. 11
2. Miller’s experiment p. 12

III. Classification systems

- A. Aristotle classified organisms more than 2,000 years ago.
  - B. Carolus Linnaeus introduced a system based on similar structures of organisms.
  - C. Modern systems based on phylogeny-the evolutionary history of an organism
  - D. Today's classification system separates organisms into 6 kingdoms.
    1. Kingdoms are the first and largest category.
    2. The smallest classification category is a species.
      - a. Organisms that belong to the same species can mate and produce fertile offspring.
  - E. Binomial nomenclature-two-word system used by Linnaeus to name species
    1. First word identifies the genus, or group of similar species.
    2. Second word tells something about the species-what it looks like, where it is found, or who discovered it.
- B. Why use scientific names?
1. To avoid mistakes
  2. To show that organisms in the same genus are related
  3. To give descriptive information
  4. To allow information to be. organized easily
- C. Tools for identifying organisms
1. Field guides-descriptions and illustrations of organisms
  2. Dichotomous keys-detailed lists of identifying characteristics that include scientific names
- D. Discussion Question
1. How do scientific names show you that organisms are related? Organisms with similar evolutionary histories are classified together. Because of this, you know that organisms in the same genus are related.

#### **IV. Science**

##### **A. Scientific method - Method for solving problems**

- 1. Clearly defined problem**
  - a. Research the problem**
- 2. A possible solution to the problem (Hypothesis)**
- 3. Test the hypothesis (Experiment)**
  - a. Variable - factor that is tested**
  - b. Control - standard to use for comparison**
- 4. Analyze data and form a conclusion**
- 5. Report results**

##### **B. Theories and Laws**

- 1. Theory - is an explanation of things or events based on observations**
- 2. Law - based on repeated data that explains how nature works**

#### **V. The SI System is based mainly on the metric system.**

##### **A. Reasons to use the metric system**

- 1. Based on 10 and multiples of 10**
- 2. The Old English system is not based on any certain number or pattern**
- 3. The metric system has basic terms that are used for each measurement**
  - a. All length use the meter**
  - b. All masses use the gram**
  - c. Volume uses the Liter, or cubed length**
- 4. The metric system has six prefixes to these units that describe how much of or how many of the unit there is.**
  - a. milli – 1/1000 or 0.001**
  - b. centi – 1/100 or 0.01**
  - c. deci – 1/10 or 0.1**
  - d. deka – 10**
  - e. hecto – 100**
  - f. kilo – 1000**
- 5. To do metric conversions all you do is multiply or divide by 10, or move the decimal point.**

#### **VI. Technology vs. Science**