

# **The Nature of Life**

## **A. The definition of life**

**1. \_\_\_\_\_ - an individual living thing**

**2. \_\_\_\_\_ - an activity that a living thing performs in order to survive.**

**3. Things in the universe can be classified into three categories:**

**a) \_\_\_\_\_ - never performed all six life processes**

**b) \_\_\_\_\_ - used to perform all six life processes**

**c) \_\_\_\_\_ - thing that performs all six life processes**

**4. The six life processes:**

**a) Get and use \_\_\_\_\_ (i.e. humans eat food)**

**b) Grow and \_\_\_\_\_**

**c) Contain similar chemicals**

**d) Respond to \_\_\_\_\_ in the environment**

**e) Made of one or more \_\_\_\_\_**

**f) Reproduce as a species**

## II. Cell Structure and Function

### A. First Sightings of Cells

1. Robert \_\_\_\_\_ was one of the first people to observe cells. He thought cells looked like little rooms, or "cells."
2. Anton van Leeuwenhoek discovered bacteria, one-celled microscopic creatures.
3. Matthias \_\_\_\_\_ concluded that all plants are made of cells.
4. Theodor \_\_\_\_\_ stated that animals are also made of cells
5. Rudolf Virchow studied cells and concluded that cells are produced by other cells.
6. The work of these scientists led to the \_\_\_\_\_ theory

## **B. The Cell Theory states:**

- 1. All living things are composed of \_\_\_\_\_.**
- 2. Cells are the basic units of structure and function in living things.**
- 3. All cells are produced from other \_\_\_\_\_.**

## **C. Microscopes**

- 1. Light microscopes- use lenses to make objects look larger**
  - a) simple light microscope- one lens**
  - b) \_\_\_\_\_ light microscope- more than one lens**
- 2. Electron microscopes- uses a beam of electron particles instead of light**

**3. \_\_\_\_\_ - how much larger the specimen appears to be**

**4. \_\_\_\_\_ - the clarity and sharpness of the image**

**D. Parts of a cell (see organelles chart)**

**E. Bacterial cells- smaller than plant and animal cells**

**1. Have cell walls and cell membranes**

**2. Do not have nuclei (plural of nucleus)**

**F. Specialized cells- multicellular organisms have cells that do special jobs.**

**G. Chemical compounds in cells**

**1. \_\_\_\_\_ -a pure substance that cannot be broken down into simpler substances.**

2. \_\_\_\_\_-smallest unit of an element
3. \_\_\_\_\_ - two or more elements chemically combined.
4. Molecule- smallest unit of most compounds; combination of atoms

## H. Chemistry of Living Things

1. Inorganic compounds- in general, compounds that do not come from living things, and usually do not contain carbon
2. \_\_\_\_\_ compounds - in general, compounds that make up or come from living things, usually contain the element carbon.
3. There are 4 basic types of organic compounds:
  - a) Carbohydrates- energy sources, i.e.- sugar, starch
  - b) Fats and oils- (lipids) long-term energy sources

c) \_\_\_\_\_ - used to build new living structures in a living thing (i.e.- meats, eggs, nuts, beans)

1) Enzymes- special protein that speeds up or slows down metabolism

d) \_\_\_\_\_ acids- stores information about how the organism works (i.e.- DNA, RNA)

## D. The Cell in its Environment

1. The cell membrane is selectively permeable, which means that some things can pass through but others cannot

2. Materials can enter/exit a cell by using:

a) Diffusion- molecules move from high concentration to lower concentration, without the cell using energy

b) \_\_\_\_\_ - the diffusion of water molecules

**c) active transport- the movement of materials through a cell membrane using energy**