Life Functions Notes
(self-check 1)

Directions: Please use these notes to check your answers to the life processes activity featuring Bowser and his friends.

Characteristics of Living Organisms:

- ✓ Made up the smallest living units – cells
- ✓ Use energy
- ✓ Have definite form and shape
- ✓ Grow and reproduce (at least at the cellular level)
- ✓ Have a limited life span
- ✓ Respond and adapt to changes in their environments
- ✓ Highly organized
- ✓ Contain complex chemical compounds

Organization of cell levels from the smallest to the largest:

cells ~~~~tissues ~~~ organs ~~~ organ systems~~~ organism

Nutrition: includes all activities in which an organism obtains materials from its environment and processes them for its use.

- ✓ ***Nutrients:*** substances an organism requires for energy, growth, repair, and maintenance
- ✓ ***Heterotroph:*** an organism that takes in preformed organic compounds from its environment
- ✓ ***Autotroph:*** an organism that makes its own food

Nutrition includes the following activities:

- ✓ ***Ingestion:*** taking in of food
- ✓ ***Digestion:*** the chemical breakdown of food ***(a.ka. enzymatic hydrolysis)***
- ✓ ***Egestion:*** elimination of **INDIGESTIBLE** wastes. Examples include **owl pellets, fur balls (cat), feces**

Transport: the movement of materials within an organism. Transport includes the following two processes:

- ✓ ***Absorption:*** process by which substances cross a cell membrane
- ✓ ***Circulation:*** distribution of substances within an organism or inside a cell

Respiration: includes all chemical processes that are released and provides the **ENERGY** necessary to maintain the life functions of the organism. **This is a process that occurs in all cells of living things.**

- ✓ **NOTE!!** ***Breathing is NOT respiration*** – it is simply the mechanical process of gas exchange.

Growth and Development:

- ✓ Growth: An increase in the size and number of cells
- ✓ Development: includes all the changes that an organism undergoes as it matures

- ✓ ***Note!! If an organism only grew and did not develop, it would look like a large newborn.***

Life Functions Notes
(self-check 2)

Synthesis: Includes all the activities by which small molecules are chemically joined together to form larger, complex molecules within an organism. (***a.k.a. dehydration synthesis***)
For example, synthesis takes the organic building blocks are the end products of digestion and builds them into the following compounds:

Digestion product (hydrolysis)	⟶	**Synthesis Product (dehydration synthesis)**
Simple sugars (glucose)		Complex carbohydrates (starches)
Amino acids		Proteins
Fatty acids and glycerol		Lipids

Excretion: Involves the removal of **CELLULAR or METABOLIC created** from the biochemical reactions that are necessary to maintain the life activities of the organism.

- ✓ Some examples of cellular wastes include **carbon dioxide, mineral salts, water, and nitrogen wastes from the hydrolysis of proteins.**

NOTE!! Egestion is part of the life function nutrition and does NOT involve any chemical changes to the food that enters the organism.

Reproduction

- ✓ At a ***CELLULAR*** level, all organisms reproduce in order to grow or replace worn-out cells
- ✓ At an **ORGANISM** level, reproduction (asexual or sexual) involves the production of new organisms.

NOTE!! Reproduction at the ORGANISM level is NOT necessary for the survival of the individual organism, but it IS NECESSARY for the survival of the species.

Regulation: the control and coordination of the various life activities of the organism. For example regulation would include an **organism's response to internal or external stimuli.**

Homeostasis: maintenance of a stable internal environment which is accomplished by the integration of all life functions carried out by the organism.

Metabolism: the sum total of the biochemical reactions required to sustain the life of an organism.

NOTE!! If an organism's **metabolism** is running correctly and is in dynamic equilibrium (all the biochemical reactions occur at the proper time and rate), then the organism is internally stable and said to be in a state of **homeostasis.**