**The Characteristics of Life**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_

***I. 8 Characteristics of Living Things:***

**1. Made of one or more \_\_\_\_\_\_\_\_\_\_\_:**

* + - * \_\_\_\_\_\_\_\_\_\_ = basic unit of structure and function of all living things
      * Unicellular-bacterium, paramecium, amoeba
      * Multicellular-humans, snakes, plants, etc.
      * Prokaryotic – no membrane bound nucleus and organelles (bacteria)
      * Eukaryotic = membrane bound nucleus and organelles (everything else)

**2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:**

* All living things \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a genetic code written \_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Genetic information is copied and passed from parent to offspring
  + Life’s genetic code is responsible for most of our traits and is almost the same in all living things—but for a few small differences

**3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:**

* + - * Species must replace themselves
      * Is \_\_\_\_\_\_\_\_\_\_necessary for the survival of the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_organism; it is needed for the survival of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!

**4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:**

* + - * Living things grow because their CELLS grow and divide!
      * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= the increase in living material (cellular mass) and the formation of new structures

* + - * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = the changes that take place during the life of the organism.

**5. Responds to Stimuli:**

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = a condition in the environment that creates a response from the organism.

o Ex: temperature, weather, other organisms, etc..

* + - * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= the reaction to a stimulus
      * o Critical for the safety and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of an organism!
      * Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= shark smells blood in the water; \_\_\_\_\_\_\_\_\_\_\_\_\_\_= shark moves quickly toward the blood and attacks any organism present

**6. Requires \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:**

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_ = the ability to do work or to make things move.

Powers life processes

Maintains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Obtained from the \_\_\_\_\_\_\_\_\_ they eat. (Plants make their own!)

Main source of energy for all life is the \_\_\_\_\_\_\_\_

o Energy not only flows through the organism, but also through the community.

**7. Maintains Homeostasis:**

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **=** the regulation of an organism’s internal environment to maintain conditions that allow it to live.

Ex: Human’s \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_, help the body maintain its proper \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-regulated by the hypothalamus

Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the blood- regulated by hormones

Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ regulation for nerve and muscle function- regulated by the kidneys and intestine

Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_balance-regulated by the pancreas/insulin

Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ balance-regulated via food/water intake and waste elimination

**8. Adaptations Evolve Over Time:**

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = are inherited changes in structures, behaviors, or internal processes that enable an organism to respond to stimuli (survive).

o *Structure and behavior examples:*

* Long hind legs enable rabbits to quickly avoid predators; fur to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ body temperature; changing fur color for the different seasons

o *Internal stimuli examples:*

* + - * + \_\_\_\_\_\_\_\_\_\_\_\_balance, \_\_\_\_\_\_\_\_balance and\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Movement**

* + Motion vs. Locomotion – what is the difference?
    - * + Motion = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
        + Locomotion = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***II. Basic Needs of Life:***

**1. Energy**

* + - Main source of energy—> \_\_\_\_\_\_\_\_\_\_\_
    - Plants get energy directly from the sun
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ get energy from dead animals and plants
    - Animals get energy from eating \_\_\_\_\_\_\_\_\_\_\_\_\_or an organism that eat plants

**2. Water and Minerals**

* + - Most organisms need \_\_\_\_\_\_\_\_\_\_\_\_\_\_in order to survive
    - Living things are made up of about \_\_\_\_\_\_\_\_water

**3. Metabolism**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = all the chemical reactions that occur in an organism.
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = All synthesis reactions in a living organism; the building of complex organic molecules from simpler ones
    - Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = Reactions involved in BREAKING DOWN complex molecules to produce simpler molecule
    - Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4. Basic Life Functions**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ -** involves the activities involved in\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (taking in and using materials for growth and energy), \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (changing food to a usable form), and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (getting rid of wastes).
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - includes the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of materials into the body fluids, or through cell membranes and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or DISTRIBUTION OF MATERIALS to all the cells of the organism. (food, water, oxygen, wastes, etc.)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - includes the chemical activities that release energy from organic molecules for use by the cells to perform all of the life functions. Requires oxygen for breathing
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – includes all those activities involved in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ OF CELLULAR WASTE PRODUCTS from the organism. These wastes include: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ CONTAINING COMPOUNDS.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - involves chemical reactions in which small molecules combine to form larger ones.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – increase in size brought about by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ IN CELL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ AND CELL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The raw materials for growth are the products of synthesis
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – involves the control and co-ordination of the life functions.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – results in the production of new individuals.

**Review of the Characteristics of Life**

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period:\_\_\_\_\_Date:\_\_\_\_\_\_\_\_\_\_\_\_

Directions: *Answer the following questions specifically and concisely.*

1. What is biology?

1. What is a cell?

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the ability to do work.

1. What is the main source of energy for all life? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a condition in the environment that creates a response from an organism.

1. What is the difference between motion and locomotion?

1. What is homeostasis?

1. What is an example of how our body maintains homeostasis?

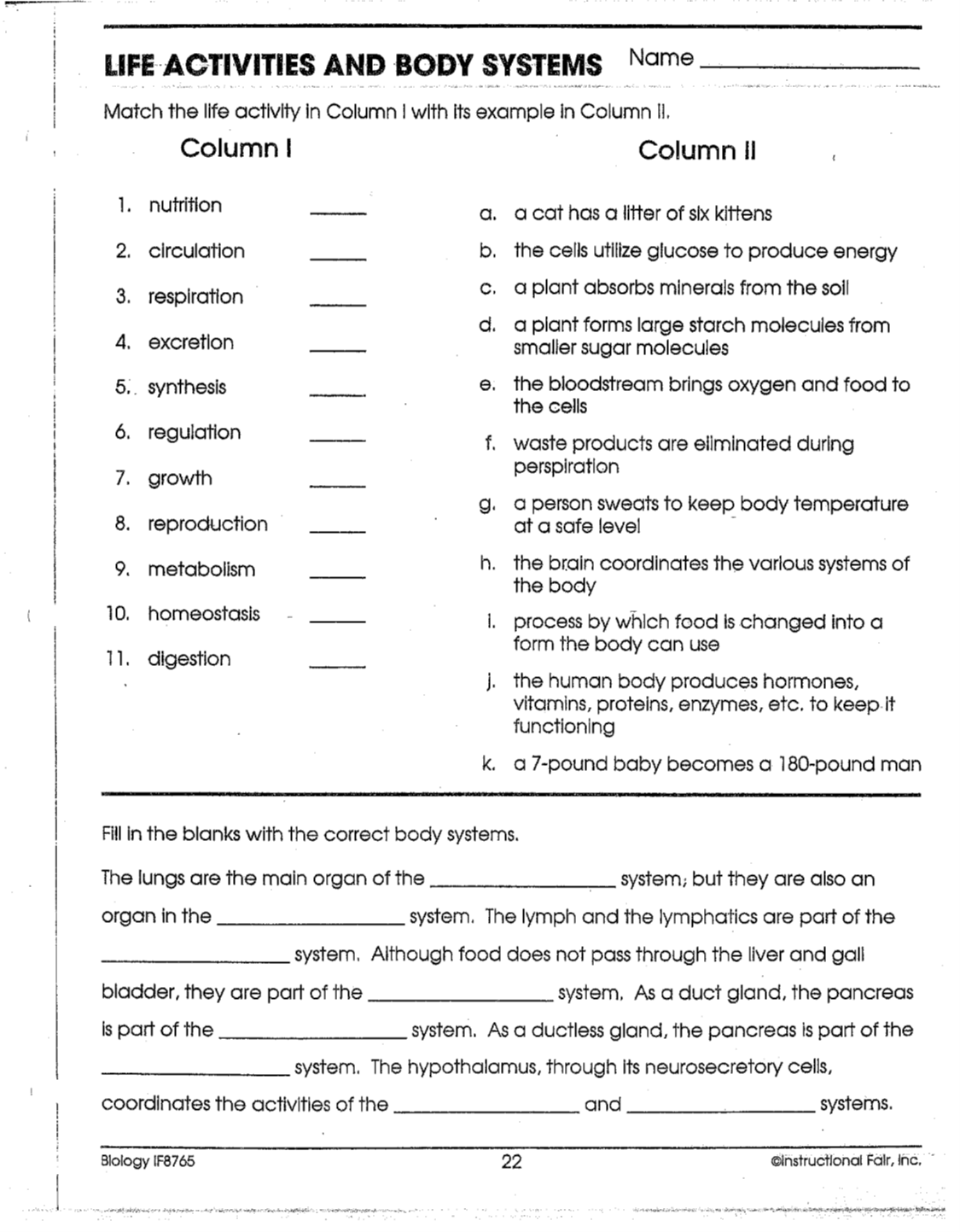
1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an increase in living material while, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the changes that take place during the life of an organism.

1. What is the “nature of science”?

1. List an example of how science is subject to change.

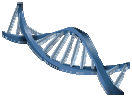
1. List an example of how science does not provide complete answers to all questions.

1. Fire has some of the characteristics of life (reproduces, needs energy, responds to stimuli). Why is it considered non-living?



Characteristics of Life & The Scientific Method Vocabulary:

1. **Biology =** study of life



1. **Cell** = basic unit of structure and function of all living things

1. **Energy** = the ability to do work

1. **Homeostasis** = the regulation of an organism’s internal environment to maintain conditions that allow it to live

1. **Science** = Continuous process that seeks to answer questions about the natural world.

1. **Growth** = the increase in living material (cellular mass) and the formation of new structures

1. **Development** = the changes that take place during the life of the organism

1. **Stimulus** = a condition in the environment that creates a response

1. **Adaptations** = are inherited changes in structures, behaviors, or internal processes that enable an organism to respond to stimuli (survive)

1. **Motion** = movement or gestures

1. **Locomotion** = the ability to travel from place to place
2. **Metabolism** = all the chemical reaction occurring in an organisms
3. **Anabolism** = all the synthesis reaction in an organism ex: photosynthesis
4. **Catabolism**  = all the breakdown reaction occurring in an organisms ex: cellular respiration
5. **Nutrition** - involves the activities involved in INGESTION (taking in and using materials for growth and energy), DIGESTION (changing food to a usable form), and EGESTION (getting rid of wastes).
6. **Transport** - includes the ABSORPTION of materials into the body fluids, or through cell membranes and the CIRCULATION or DISTRIBUTION OF MATERIALS to all the cells of the organism. (food, water, oxygen, wastes, etc)
7. **Respiration** - includes the chemical activities that release energy from organic molecules for use by the cells to perform all of the life functions. Requires oxygen for breathing.
8. **Excretion** - includes all those activities involved in the ELIMINATION OF CELLULAR WASTE PRODUCTS from the organism. These wastes include: WATER, CARBON DIOXIDE, SALTS, and NITROGEN CONTAINING COMPOUNDS
9. **Synthesis** - involves chemical reactions in which small molecules combine to form larger ones.
10. **Growth** – increase in size brought about by INCREASES IN CELL SIZE AND CELL NUMBER. The raw materials for growth are the products of synthesis.
11. **Regulation** - involves the control and co-ordination of the life functions.
12. **Reproduction** - results in the production of new individuals.