

Sec.: \_\_\_\_\_ Name: \_\_\_\_\_

Experiment: Characteristics of Living Things

(B. Science 10-1-3c)

Purposes: To learn and observe the characteristics of living things.

Materials: slides Dm101 Ht109 Td202 Ps 101 Pc102  
cork cells walnut paper clip  
100 mL beaker fungus on dead branch  
gray & white paper "moths"

Methods: Each letter under "Results" is another characteristic of living things as outlined in the book.

Results:

a. Observe slides of onion (Dm101), human muscle (Ht109), human intestine (Td202), and amoeba (Ps 101). What is the common unit of these items, and for all life? \_\_\_\_\_ Does bacteria, plants, amoeba, and human being have this unit? \_\_\_\_\_

**Cells are the basic units in which substances are organized in the living condition. Cells are enclosed by a barrier that separates the cell from its surroundings.** Observe cork cells. Are they alive? \_\_\_\_\_ Cells may remain for some time after an organism dies, so their presence alone does not prove a living condition. However, we know that cells are produced only by organisms and are never organized by nonliving materials. Some organisms are **multicellular**, made of many cells. While other organisms are **unicellular**, made of one cell.

b. Observe a slide of a paramecium (Pc102). How does the size of the new parameciums compare to the mature ones? \_\_\_\_\_ They grow in size to become like adult. Now take a rock and break it into two parts will they grow into two of original sizes? \_\_\_\_\_

**Only living things reproduce, by sexual reproduction (from two parents) and/or by asexual reproduction (from one parent).**

c. Gen 1:25 God made the wild animals according to their kinds, the livestock according to their kinds, and all the creatures that move along the ground according to their kinds. And God saw that it was good. Gen. 1:27 So God created man in his own image, in the image of God he created him; male and female he created them. 28 God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish of the sea and the birds of the air and over every living creature that moves on the ground." For different organisms to exist and keep on having offspring "after their kind", God created \_\_\_\_\_, so that the **genetic traits (code) can be passed on from one generation to the next.** For asexual reproduction the offspring will be identical to parent, while for sexual reproduction the offspring will resemble the main traits of the parents but there is more genetic variation.

d. Describe how a nonliving icicle grows: \_\_\_\_\_  
Observe young fish and mature fish, how do they grow, do they add more fish cells from another source or do they create their own new cells? \_\_\_\_\_ When fish (or generally organisms) become full size they still continue to grow. What type of growth is this? \_\_\_\_\_ **Living things do not simply gather more of their own material, they produce cells and organize them. All**

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**organisms have a fairly definite period of life, which we call the life span.**

Think of and list the 5 stages of a life span. 1) \_\_\_\_\_, 2) \_\_\_\_\_, 3) \_\_\_\_\_, 4) \_\_\_\_\_, and 5) \_\_\_\_\_. Do all organisms have the same length of growth period? \_\_\_\_\_ Some bacteria live for only hours, while the redwood of California live for a couple of thousand years, while human life span is about 70 years.

e. Place a opened paper clip through a walnut, and place the wire on the top of a 100 ml beaker so the walnut is placed in the center of the beaker. Place a burning match under the walnut and allow it to burn. Why do we need to eat food? \_\_\_\_\_ Why does every animal need food? \_\_\_\_\_ Plants do not need food, where do they get their energy? \_\_\_\_\_ **Life continues only as long as energy is supplied for metabolism.** Observe the fungus living of the dead branch, fungi and some bacteria obtain their energy by breaking down dead material and are known as \_\_\_\_\_. **Only organisms organize (anabolism) simple substances into a complex state.**

f. Do animals respond to stimulus from the environment? \_\_\_\_\_. Give some examples: \_\_\_\_\_. Do plants respond to stimulus from the environment? \_\_\_\_\_. Give some examples: \_\_\_\_\_. **A living organism is able to respond to the environment (conditions outside itself).** We refer to this environmental force that causes a reaction as a **stimulus**. List some environmental factors that an animal has to live through and grow in. \_\_\_\_\_ & \_\_\_\_\_. **An organism's environment is all the conditions under which the organism lives.** Compare the conditions & growth of a pine tree in the dry plains out west to that of a pine growing in Michigan. Dry plains: \_\_\_\_\_, Michigan: \_\_\_\_\_. **The process by which organisms respond to stimuli in ways that keep conditions in their body suitable for life is called homeostasis.**

g. During the winter the temperature may get so low that our body responds to this decreased temperature by \_\_\_\_\_. While in the summer the temperatures may rise too high causing our body to \_\_\_\_\_. **Homeostasis is the process by which organisms keep their internal conditions relatively stable.**

h. Place gray and white colored "moths" of the same species on a dark surface. Pretend that you are a predator of the moth. Close your eyes and quickly open them and pick up the first moth you see. Record the color of the moth you "ate" and return it to the pile. Repeat this process 10 times. Gray: \_\_\_\_\_ White: \_\_\_\_\_. Which moths are most likely to survive and be able to reproduce: \_\_\_\_\_ Over a number of generations there will only be gray moths from this species. **The process, in which a species slowly or rapidly becomes better suited to survive, is called adaptation. This is the driving force for microevolution.** We see evolution occurring on the small scale. However, as Christians, we would generally not believe in **macroevolution**, which requires massive amounts of change, with billions of years of time required to make this change.

Conclusions:

1. We know from Gen.1 that God created the world, but comment on God's role in creating life (as in human beings) today (Ps. 139: 13 - 16)?