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Characteristics of Life Lab

Prelab:

What are the essential characteristics required for anything to be alive?

For something to be alive, it must be made up of cells, reproduce, obtain and use energy, have metabolism, maintain homeostasis, pass down hereditary traits, respond to its environment, grow, develop, and adapt to their environment through evolution.

Problem: Scientists use the following characteristics of life to determine if an object is alive. Even if one characteristic is missing, the object cannot be alive. Write a definition for the seven main characteristics of life.

1. Made of Cells: organisms consist solely of cells, the basic building blocks of life, which carry out the important functions in the organism
2. Reproduction: the act of producing offspring, sexually or asexually
3. Metabolism: the total of all chemical reactions in an organism, including both anabolism and catabolism
4. Homeostasis: a stable state of conditions in the body that are necessary for life
5. Heredity: the passing on of traits, either physical or mental, through genes composed of DNA carrying genetic info and mutation changing DNA codes
6. Evolve: develop and adapt over long periods of time because of natural selection
7. Interdependence: an organism's dependence on other organisms in its ecosystem to survive

Experiment:

1. There are 12 items listed in the table.
2. Highlight with color the characteristic of the object that is *currently* missing.
3. You must state the *current* condition of the material (alive, dead, dormant, made from or never alive)
4. Write the evidence that supports your decision. DO NOT WRITE THE OBJECT'S NAME

(example: plastic car, leaf).

Item	Missing Characteristics	Condition	Evidence Supporting Type of Condition
Apple in a box	1.Made of Cells 2.Interdependence 3.Reproduction 4.Metabolism 5.Heredity 6.Homeostasis 7. Evolve	alive	-take a sliver of an apple in a microscope to view cells that are still living - the seeds in the apple can be planted and given water to grow
Bean Seed	1.Made of Cells 2.Interdependence 3.Reproduction 4.Metabolism 5.Heredity 6.Homeostasis 7. Evolve	dormant	- plant the seed in soil with adequate nutrients and water and it will grow, but by itself, the bean can't grow or develop, so it's dormant
Wood	1.Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	dead	- wood is only alive when on a tree, but when processed, all cells are killed
Jelly	1.Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	never alive	-jelly is made from pectin, sugar, water, acid, and other flavorings, none of which contain cells -use a microscope to examine jelly and see that it has no cells
Egg	1.Made of Cells 2.Interdependence 3.Reproduction 4.Metabolism 5.Heredity 6.Homeostasis 7. Evolve	dormant	- an egg can hatch and grow into an organism which meets all the characteristics, though only if fertilized, so without fertilization, it is dormant
A plucked leaf.	1.Made of Cells 2.Interdependence 3.Reproduction 4.Metabolism 5.Heredity 6.Homeostasis 7. Evolve	alive	- look at a leaf through a microscope to see the cells, especially the chlorophyll inside them
Paper	1.Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	made from	-paper is made from wood, glue, and other substances (pigments, coloring, stabilizers), and wood is processed in a way that kills cells

Plastic Car	1. Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	made from	-plastic is made through the combination of organic materials like cellulose, coal, and crude oil, and cellulose is found in plants to help strengthen its cell walls
A bouquet of flowers	1. Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	alive	-the ovary contains male gametes and the anther male ones, so a flower can reproduce -examining the outer layer of a flower using a microscope will show the cells of its dermal tissue
Grapes	1. Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	alive	-take a sliver of a grape in a microscope and look at the cells -for grapes that have seeds, the seeds can be planted to grow new grapes
Clouds	1. Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	never alive	-clouds are formed when lots of water vapor condenses on dust to form water droplets, which collect to form clouds; because water is non-living, clouds are also non-living
Water	1. Made of Cells 2. Interdependence 3. Reproduction 4. Metabolism 5. Heredity 6. Homeostasis 7. Evolve	never alive	-water can be examined through a microscope to see there are no cells, but just oxygen and hydrogen atoms