

Test Review- Characteristics of Life, Scientific Method and Osmosis

Name: _____ Period: _____ Date: _____

Characteristics of Life Review:

1) All organisms are made of cells

some organisms are UNICELLULAR (one cell big) and some organisms are MULTICELLULAR (made up of many cells)

The organizational levels (hierarchy) from least complex to most complex are:

Cell- Tissue- Organ- Organ System- Organism

2) Organisms reproduce to pass on genetic materials (DNA).

Asexual Reproduction: One parent creates identical offspring

Sexual Reproduction: Two parents combine genetic material to make one unique offspring

3) Organisms Grow and develop over their life cycle.

4) Organisms use energy.

Autotroph/Producer: Makes their own food

Heterotroph/Consumer: Eats another organism for energy

5) Organisms respond to their external and internal environment.

Homeostasis: Responding to a change in the internal environment to maintain balance inside an organism.

Ex: sweating when your body is hot

6) Population of organisms adapt to their environment over time.

Organisms must possess ALL of the characteristics of life...but they do NOT have to have them all at the same time.

(Babies don't have the ability to reproduce but they are still alive)

Review Questions: True/False (correct any false statements)

1) Some living organisms do not have cells. _____

2) Only multicellular organisms grow and develop. _____

3) Some organisms reproduce with only one parent. _____

4) All living organisms adapt over time to their environment. _____

5) All organisms must maintain homeostasis. _____

6) All organisms must eat food to get energy. _____

7) Plants do not need energy. _____

8) Cells are the basic unit of structure for all living organisms. _____

9) There are nonliving things that have some but not all of the characteristics of living organisms. _____

10) All living organisms must possess all of the characteristics of life at the same time. _____

Well Designed Investigation: A well designed investigation is a controlled study by scientists where only one variable is changed to see how it affects another variable. It has an experimental group (the group where the independent variable is being changed) and a control group. The control group is used as a comparison. In the control group, the changes that are made to the independent variable are not made (ex: plants with no fertilizer added, or people not receiving the test medicine) but data is collected (dependent variable). A hypothesis is formed based on prior investigations/observations. A conclusion is formed from the data. A well designed investigation should not be influenced by bias (ignoring data that doesn't match your hypothesis). A well designed investigation should have a large sample size for the control and experimental groups (ex: 100 in the control group and 100 in the experimental group). It should also have many constants/controlled variables (the other parts of the investigation that you keep the same). Lastly, the procedures must be detailed enough that someone else can follow the same steps to repeat the experiment.

Independent variable: what the experimenter is changing to see how it effects the dependent variable.

Dependent variable: what you are measuring in both the control and experimental groups

Control group: A comparison group in which you do not change the independent variable but collect data on the dependent variable.

Experimental group: The group in which you change the independent variable and collect data on the dependent variable

Constants/controlled variables: The other parts of the experiment that you keep the same through each trial so that they do not cause a change in the dependent variable. (These are not listed in the description of the experiment so you have to come up with these from your background knowledge)

Sample Question:

A scientist wants to test spraying different amounts of the hormone ethylene to freshly picked apples to see if the hormones decrease the amount of time it takes the apples to ripen.

Independent Variable: amount of hormone ethylene

Dependent Variable: the time it takes the apples to ripen

Experimental group: Apples sprayed with different amounts of hormone

Control group: Apples that haven't been sprayed with hormone

Constants/Controlled Variables: Type of apple, number of apples in each group, temperature and humidity of apple storage, container in which the apples are stored.

Review Questions:

11) A scientist wants to see if using hot pepper spray will decrease the number of insects on a tomato plant.

Independent Variable: _____

Dependent Variable: _____

Experimental Group: _____

Control Group: _____

List at least 4 Constants/Controlled Variables: _____

12) A scientist wants to see if adding beat juice on ice increases the speed at which the ice melts.

Independent Variable: _____

Dependent Variable: _____

Experimental Group: _____

Control Group: _____

List at least 4 Constants/Controlled Variables: _____

13) Students tested two cleansers for their effectiveness against bacteria. In their experiment, each cleanser was used on two different household surfaces. The students took samples from each surface before and after using each cleanser. Then they transferred each sample to a culture medium. The students counted the number of bacterial colonies that grew on each culture medium. The results of their test are shown in the table.

EFFECTIVENESS OF HOUSEHOLD CLEANSERS

Cleanser	Household Surface	Number of Colonies Before Scrubbing	Number of Colonies After Scrubbing
1	Counter 1	160	2
1	Sink 1	240	4
2	Counter 2	145	28
2	Sink 2	250	60

Which of these would be the best control for their experiment?

- A. Use only Cleanser 1 on both sinks and counters.
- B. Use Cleanser 1 on the sinks and Cleanser 2 on the counters.
- C. Test the number of bacteria on the counters and sinks after scrubbing without using cleansers.
- D. Test the number of bacteria on the counters and sinks without scrubbing with cleansers.

HEART RATE DURING EXERCISE

14. Look at the chart to the right.

What is the independent variable?

What is the dependent variable?

What is missing in this experimental setup?

Student	Heart Rate (bpm*)				
	1 min. of exercise	2 min. of exercise	3 min. of exercise	4 min. of exercise	5 min. of exercise
1	88	98	102	110	110
2	92	96	103	115	118
3	87	100	112	112	130
4	93	109	115	120	122
5	90	93	101	112	112
Average	90	99	107	114	118

*bpm = beats per minute

18) Urbanization: Based on the lessons from the past two weeks, identify the major problems that have come from changing forested/agricultural land into streets, sidewalks and building. How have these changes affected our water ways (streams, creeks, rivers) in Montgomery County?

Ecosystem	Organisms
Forest	Oak Tree, seed eating birds
Fresh Water	Rainbow trout, frogs, freshwater microorganisms
Swamp	Alligators, Mangrove Tree, frogs, freshwater microorganisms
Marsh	Spartina and other marsh grasses, marsh birds
Estuary	Crabs, Oysters, Bay grasses, Sea horses, fish
Ocean	Sharks, Tuna, Seaweed, phytoplankton and zooplankton (microorganisms)

19) Use your notes from your packet to determine which ecosystems/organisms would be the most effected by changed in salt levels?

Most effected=

Least effected=

20) What is osmosis?

21) Which way does water move when a cell from a fresh water plant is placed into a very salty solution?

22) If water is moving into a plant, where is there a higher concentration of salt....outside the plant or inside the plant?