Heterotroph/Consumer: Eats another organism for energy

5) <u>Organisms respond to their external and internal environment.</u>
Homeostasis: Responding to a change in the internal environment to maintain balance inside an organism.
Ex: sweating when your body is hot

6) <u>Population of organisms adapt to their environment over time.</u>

<u>Organisms must possess ALL of the characteristics of life...but they do NOT have to have them all at the same time.</u>
(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. __False__ (All living organisms have cells)

2) Only multicellular organisms grow and develop. __False__ Single celled organism grow + develop too

3) Some organisms reproduce with only one parent. __True (Asexual Reproduction)__

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

5) All organisms must maintain homeostasis. __True__

6) All organisms must eat food to get energy. __False - Plants make food through photosynthesis__

7) Plants do not need energy. __False - Plants make sugar to use for energy__

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

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

10) All living organisms must possess all of the characteristics of life at the same time. __False -__
__Babies can't reproduce but are still alive.__

Independent variable: what the experiment is

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 d
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
so that they do not cause a change in the dependent variable. (These are not listed in the description of th
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 se
the hormones decrease the amount of time it takes the apples to ripen.

<u>Independent Variable</u>: amount of hormone ethylene
<u>Dependent Variable</u>: the time it takes the apples to ripen
<u>Experimental group</u>: Apples sprayed with different amounts of hormone
<u>Control group</u>: Apples that haven't been sprayed with hormone
<u>Constants/Controlled Variables</u>: 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 <u>using hot pepper spray</u> will decrease the <u>number of insects on a tomato plant.</u>

Independent Variable: __Adding hot pepper spray__

Dependent Variable: __# of insects on a tomato plant__

Experimental Group: __50 tomato plants w/ the same amount of hot pepper spray on them__

Control Group: __50 tomato plants w/o spray__

List at least 4 Constants/Controlled Variables: __Type of plant, # of light, type of soil, # of water__

Seed Germination

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

Independent Variable: _Adding beet juice_

Dependent Variable: _Speed at which ice melts_

Experimental Group: _30 same size pieces of ice melting w/ beet juice on then_

Control Group: _30 same size pieces of ice melting w/o beet juice_

List at least 4 Constants/Controlled Variables: _Size of ice, temp in room,_
Surface ice is on, #raft Air flow in room w/ ice

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
1	Sink 1		240
2	Counter 2		145
2	Sink 2		250

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.

14. Look at the chart to the right.

What is the independent variable?
· _# of Min of_
Exercise

What is the dependent variable?
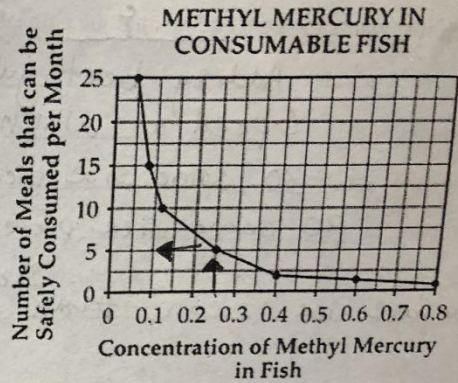_Heart Rate_

What is missing in this experimental setup?
· _Control Group- Heart Rate_
before exercizing

HEART RATE DURING EXERCISE

Student	Heart Rate (bpm*)				
	1 min. of exercise	2 min. of exercise	3 min. of exercise	4 min. of exercise	5 min. o 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

ok at the graph to the right. How many meals can be consumed per month when fish have a Methyl ıry concentration of .25 ppm?

A) .4   B) 2.5   C) 5   D) 25

the concentration of Methyl Mercury increases in fish
appens to the number of meals per month that can be
:onsumed?

:ases   B) Decreases   C) Stays constant

METHYL MERCURY IN CONSUMABLE FISH

Number of Meals that can be Safely Consumed per Month

Concentration of Methyl Mercury in Fish

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riment to test this hypothesis.

Independent variable: __Adding Protein Powder__

Dependent variable: __Muscle Mass__

Experimental Group: __50 people who add protein powder to their diet__ (describe who is in it/size of group)

Control Group: __50 people who do NOT add protein powder to their diet__ (describe who is in it/size of group)

Constants/Controlled Variables: (at least 4) __Amount of Exercise people do, Similar # of men/women in each group, Similar diets, Take Muscle Mass before & after and compare % change.__

the basic procedures that the scientist would follow to run this experiment:

① Separate ~~2 groups of people~~ 100 people with similar exercise & diet habits into 2 groups.

② Take the muscle mass of all of the people

③ Have the 50 people in the experimental group add ~~¼ cup of~~ 2 tablespoons of protein powder into a glass of water & drink it each day.

④ Have the people in both the experimental/Control group continue with the same amounts of exercise & to eat a similar diet.

⑤ After 3 months take the muscle mass of all of the participants and compare the experimental group to the control group to see if there is a difference.

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?

Changing land from farmland/forest to roads/houses/streets decreases the area (soil) available to absorb rain/storm water and increases the surfaces to salt in the winter. Increased water flow in the streams erodes the banks which makes the streams wider. This decreases the depth of the water which makes it hotter in the summer and doesn't allow large fish to live in the streams. Increased salinity of the streams kills off plants and animals. The salt causes water to leave the cells by osmosis which harms the organisms.

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
Esturary	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=

Forest, Fresh Water, Swamp
(ALL Freshwater)

Least effected=

Marsh, Estuary, Ocean
(All contain salt)

20) What is osmosis?

Osmosis is the diffusion of water through a membrane from a higher water concentration to a lower water concentration.... or water will move towards a higher solute concentration.

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

Water would move out of the cell by osmosis causing the cell to shrink.

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

Higher conc. of Salt inside cells.

water

water will move towards the higher concentration of salt to dilute it and make it have a similar conc on both sides.