Identifying Variables Worksheet

Instructions: Read the question, hypothesis and experiment. Identify the variables for each example.

Experiment #1
***Question*:** Does penicillin prevent infection?
***Hypothesis*:** If the medicine prevents infection, than the medicine will prevent the growth of bacteria that cause infection.
***Experiment*:** Leo placed two circles of paper in a Petri dish (something used for growing bacteria). One circle of paper was soaked in penicillin. The other had nothing on it. He poured a liquid filled with bacteria into the Petri dish. Both circles of paper were placed in the Petri dish about 3cm apart.

At the end of the experiment, a circle with a radius of 2cm formed around the circle of paper soaked in penicillin. There were no bacteria growing in the 2cm circle. No change had occurred around the other circle of paper. The bacteria were growing well.

A. What was the independent variable? the presence of penicillin
B. What was the dependent variable? bacterial growth
C. What was the control? the circle with nothing on it
D. Was there a constant variable? It was not mentioned (the amount of liquid filled with bacteria for each Petri dish, the type of bacteria and the size/diameter/radius of the paper circle should all be the same).
E. If yes, explain. _____

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Experiment #2
***Question*:** Do different types of music affect how well a person can do his/her homework?
***Hypothesis*:** Music that does not have a strong beat makes concentrating on a homework assignment easier.
Music with heavy beats makes concentration more difficult.
***Experiment*:**

Sara Lilia pulled out four different CD's to find out which type helped her to finish her homework the fastest. The first CD was rock, the second reggaeton, the third classical, and the fourth was cumbia. She chose a math assignment that required concentration.

Sara Lilia used a stopwatch with an alarm to make sure that she only listened to each CD for 5 minutes. Each time the alarm went off, Sara Lilia recorded how many problems she was able to finish.

At the end of the experiment, she found that she was able to concentrate the most with the classical music, then the rock, and the cumbia. She noticed that she did not concentrate much at all with the reggaeton and felt like dancing and singing along instead of working.

A. What was the independent variable? type of music
B. What was the dependent variable? the number of Math problem that Lilia could finish
C. What was the control? None
D. Was there a constant variable? the time spent on each CD (5 mins); type of homework (math)
E. If yes, explain. _____

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In Science experiments, it is very important to "control the variables" so that there is only ONE independent variable and ONE dependent variable. **We "control the variables" by making anything else that *could***

Identifying Variables Worksheet

Instructions: For the following experiments, *identify and describe* the (IV) independent variable, (DV) dependent variable, (CG) control group, and (Con) the constant.

1) Different rose bushes are grown in a greenhouse for two months. The number of flowers on each bush is counted at the end of an experiment.

IV different rose bush

DV number of flowers

Con environmental factors (greenhouse-equal amount of sunlight, water, CO_2 etc); length of experiment period (2 months)

2) You water three sunflower plants with salt water. Each plant receives a different concentration of salt solutions. A fourth plant receives regular water. After a two-week period, the height is measured.

IV concentration of salt solution

DV height of plant

CG the plant that receives regular water

3) Three wax palm trees are kept at different humidity levels inside of a greenhouse for 12 weeks. One tree is left outside in normal conditions. Height of the tree is measured once a week.

IV humidity level

DV height of tree

CG the tree that is left outside in normal conditions

Con length of experiment period (12 weeks); species/type of tree

4) One tank of goldfish is fed the normal amount of food once a day, a second tank is fed twice a day, and a third tank four times a day during a six week study. The fish's body fat is recorded daily.

IV frequency of feeding

DV body fat level of fish

CG the tank that was fed the normal amount of food once a day

Con the amount of food per feeding; the environmental factors of the tanks (oxygen level, pH etc)

5) Strawberry plant clones are given different amounts of water for a 3-week period. First strawberry plant receives 400 millilitres (ml) a day. The second strawberry plant receives 200ml a day. The third strawberry plant receives 100ml a day. The fourth strawberry plant does not receive any extra water; this plant only receives natural ways of receiving water. The height of the strawberry plants is recorded daily.

IV: amount of water given

DV: height of strawberry plant

CG: the plant that did not receive any extra water

Con: the length of the experiment period (3 weeks); environmental factors such as sunlight and humidity