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.

medium eg agar broth etc anything that acts as food for bacteria

A. What was the independent variable? penicillin or no penicillin

B. What was the dependent variable? radius size around circle

C. What was the control? circle with no penicillin

D. Was there a constant variable? same size papers, same volume, same Petrie dish, same medium

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? # of problems completed

C. What was the control? none

D. Was there a constant variable? t = 5 min, hopefully exact same type of problems

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* change during the experiment into a constant.** For example, if you are doing an experiment to find out what material can hold more water, then it is important to make sure all the materials you are testing are the same size. **Why is it so important to control the variables? What would happen if we did not control them?**

Then you are changing more than one independent variable & you cannot conclude anything as a result

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 # of flowers on each bush

Con t = 2 months, greenhouse = hopefully sun-, water, fertilizer etc

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 % salt concentration

DV height

CG regular water plant

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 diff humidity levels

DV height

CG not the tree left outside because ↗ is natural & no control or this

Con nothing kept constant if tree is outside ↙

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 diff # of feedings/day

DV body fat

CG ∅ OR normal ant of food (1x)/day

Con ant of food/feeding, t = 6 weeks.

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 vol of water given per day

DV height

CG plant receiving natural water

Con t = 3 weeks, ant of food, etc