Science 9

Scientific Method I

Name:
Date:
Block:

Practice:

1. Rebecca notices that some of the plants in her garden are growing very quickly, whereas the same plants in other parts of her garden are not. After doing some research, she discovers that the plant that she has in her garden need a certain amount of sunlight everyday to grow well. She decides to conduct an experiment. She grew five of the same plants and exposed them to sunlight for a specified period of time. After 6 weeks, she measures out the height of her plants. Here are her results:

Plant #	Amount of time exposed to light	Final height
1	20 min	3.0 cm
2	40 min	6.0 cm
3	60 min	14.0 cm
4	80 min	18.0 cm
5	100 min	29.0 cm

Based off of Rebecca's experiment and results, answer the following questions:

a. What was the independent variable?

Amount of time exposed to light

b. What was the dependent variable?

Final height of the plant

c. List 3 controlled variables in Rebecca's experiment.

- Type of soil
- Species of plant
- Amount of water etc.

d. Write a hypothesis that would fit into Rebecca's experimental setup.

If I place my plant outside in the sun for longer, then the plant will grow taller

e. Write a proposed conclusion Rebecca could make for her experiment.

The longer periods of light that the plant receives, the taller the plant will grow

2. Outline how you would plan out an experiment using the Scientific Method to test out how much water an individual should be drinking every day in order for a person to feel more awake during the day.

1. Question : How much water should a person drink everyday to feel awake?
2. Research : Drinking water helps people feel more awake
3. Hypothesis : If a person drinks 8 cups of water everyday, then they will feel more awake
4. Example experiment :
   1. Find 10 people
   2. Each person will be given a certain amount of water everyday for one month
   3. At the end of each day, the participants will do a survey about their energy levels
5. Analysis & Data
6. Conclusion

3. Chelsey wants to know why different types of water will freeze at different temperatures. She goes to the library and conducts some research about the properties and composition of fresh water and sea water. She decides to set up an experiment to see whether sea water or fresh water will freeze at a lower temperature. Chelsey then goes to her lab and does the following:
   a. Fills 2 beakers with water.
   b. Dissolves 20g of salt into one beaker.
   c. Places both beakers into the freezer at -1.5°C for 2.0 hours.

   Chelsey takes out both the beakers at the same time and notes that the beaker containing salt water is a liquid and the beaker that has no salt in it has frozen.

   a. Write a hypothesis that would fit with Chelsey's experiment set-up. Be sure to use an **if…then** statement.
   If seawater has salt in it, then it will freeze at a lower temperature than fresh water

   b. What conclusion could Chelsey make based on her observations?
   The more salt in the water, the lower the temperature must be in the end to make it freeze

   c. What is the independent variable in this experiment?
   The type of water (salt / fresh)

   d. What is the dependent variable in this experiment?
   The state of water in the end (solid / liquid)

   e. What are 2 controls in this experiment?
   - Amount of water
   - Time spent in freeze