Name _____ period _____

Science Skills -8

Finding Constants

As you know, whatever can change or vary in an experiment is called a variable. There are many variables in an experiment. To have a valid experiment one variable must be tested and one must respond. All the other variables must not be changed. These variables that are not changed are called constants.

Directions: Identify two constants in each experiment below.

After studying about recycling, members of Juan's 8th period class investigated the effect of various recycled products on plant growth. Juan's lab group compared the effect of different aged grass compost on bean plants. They thought that older grass compost would produce taller plants. Three flats of bean plants (12 plants/flat) were grown for 5 days. The plants were then fertilized as follows: (a) Flat A: 450g of 3-month-old compost, (b) Flat B: 450g of compost and (c) Flat C 0g of compost. The plants received the same amount of sunlight and water each day. At the end of 30 days the group recorded the height of the plants in centimeters.

1. _____

2. _____

In chemistry class, Alonso determined the effectiveness of various metals in releasing hydrogen gas from hydrochloric acid. Several weeks later, Alonso read that a utilities company was burying lead next to iron pipes to prevent rusting. Alonso thought that less rusting would occur with the more active metals. He place the following into 4 separate beakers of water: (a) 1 iron nail, (b) 1 iron nail wrapped with an aluminum strip, (c) 1 iron nail wrapped with a magnesium strip, (d) 1 iron nail wrapped with a lead strip. He used the same amount of water, equal amounts (mass) of the metals and same type of iron nails. At the end of 5 days, he rated the amount of rusting as small, moderate or large. He also recorded the color of the water.

3. _____

4. _____

Yesinia read that certain perfume ingredients, called esters, would agitate bees. Because perfume formulas are secret, she decided to determine whether the unknown Ester X was present in four different perfumes by observing the bees' behavior. She placed a saucer containing 10 mL of the first perfume 3 meters from the beehive. She recorded the time required for the bees to emerge and made observations on their behavior. After a 30-minute recover period, she tested the second, third and four perfumes. All experiments were conducted on the same day when the weather conditions were similar, that is, air temperature and wind.

5. _____

6. _____

Sarah observed that different kinds and amounts of fossils were present in a cliff behind her house. She wondered if changes in fossil content occurred from the top to the bottom of the cliff. She marked the cliff at five positions: 5, 10, 15, 20 and 25 meters from the top. She dug out and removed 1 bucket of soil from each of the positions and determined the kind and number of fossils in each sample.

7. _____

8. _____

Juanita read that *Aloe Vera* promoted healing of burned tissue. She decided to investigate the effect of varying amounts of *Aloe Vera* on the regeneration of a flatworm called a planaria. She cut the planaria in half to obtain 10 parts (5 heads and 5 tails for each experimental group. She applied concentrations of 0%, 10%, 20% and 30% *Aloe Vera* to the groups. Fifteen mL of *Aloe Vera* solutions were used. All planaria were maintained in a growth change with identical food, temperature and humidity. On Day 15 Juanita observed the regeneration of the planaria parts and categorized development as full, partial or none.

9. _____

10. _____