

1. Ahmad wants to know how far he throws a football on average. He decides he will take 3 steps, the same distance apart, before throwing the football. Then he measures the spot from where he last step to the spot where the football hits the ground. He does this three times and finds he threw the ball 35 yards, 47 yards, and 37 yards for an average of 40 yards. What could he improve upon in his experimental design?

- a.) He could increase the number of trials for more data points.
- b.) He could use more than one football during the trials.
- c.) He could vary the speeds at which he is throwing the ball during each trial.
- d.) a & c

2. Destine is studying how varying temperatures affect germination patterns in radish seeds. Germination is the process by which seeds begin to grow. Keeping all other variables constant she grows 3 groups of plants three different treatment temperatures. After one week she measures the length of the emergence. Her averages are listed below:

Treatment	Temperature (degrees Fahrenheit)	Average length (cm)
1	68	3.1
2	69	3.2
3	70	3.2

I. From this data Destine can conclude,

- a.) Temperature influences germination in radish plants.
- b.) Temperature does not influence germination in radish plants.
- c.) More testing is needed to determine the relationship between temperature and germination.

II. In this experiment, the independent variable was \_\_\_\_\_.

III. The dependent variable was \_\_\_\_\_.

IV. Propose one change Destine could make to her experimental design to gather more data on the relationship between temperature and germination. Write the variable that would be tested as well at least 3 variables that would have to be controlled during the experiment.

V. Plant germination is influenced by many natural factors. Which of the following scenarios is a testable hypothesis Destine could use in a follow up study?

- a.) Water could influence germination in radish seeds.
- b.) The more water a radish seeds absorbs, the longer the sprout will be from a radish.
- c.) If water influences the growth in radish seeds, than different sprout lengths in radish seeds will be observed when treated with differing amounts of water.
- d.) If the radish absorbs water than the length of emergence will not be affected.

3. Years of driving on salty, Michigan winter roads has caused parts of Ms. Beggs' car to rust. She wants to experiment to find different products that effectively remove rust. Before she tests the products on her car, she is going to test the products on some rusty nails. Which of the following would be the most appropriate experimental design to go about answering this question?

*\*Note: mass = the amount of matter a substance has.*

*\*steel is the metal that is found on the frame of cars. Steel is a composition of iron and carbon and different steels are made with different amounts of those two elements.*

- a.) She could experiment using different types of rusted steels to collect data on how each steel changes mass over time in a treatment.
- b.) Experiment using a case-study where she picks one treatment and collects data at different time intervals to see how the mass of the nail changes over time.
- c.) Experiment using a comparative study, by placing rusty nails in different treatments and collecting data on how the mass of the nail changes over time.

4. During an unusually hot week during the summer of 2012 in Chicago, the temperatures at the hottest point during the day were 97, 101, 102, 97, 103, 99, and 97 degrees Fahrenheit. Calculate the mean, median, and mode for the temperatures that week.

***\*Show your work above! And write your answers on the lines below:***

Mean: \_\_\_\_\_

Median: \_\_\_\_\_

Mode: \_\_\_\_\_