

Diversity (Variation) Among Individuals in a Species

Purpose/Problem: To investigate the variations that naturally exist among members of a species. These observations provide evidence that life forms change over time. This is one mechanism of evolution.

Research/Hypothesis: Many of the early scientists were naturalists, spending their time making collections and observations about the life forms on the planet earth. Charles Darwin was such a scientist. He sailed as a naturalist on the HMS Beagle, making observations and collections along the coast of South American and points west. On his visit to the Galapagos Islands Darwin found that tortoises and finches varied slightly from one island to another. At home in England he observed that plant and animal breeders were able to create new varieties by selectively breeding the parents for the traits they wish to produce. Some of these variations helped the species to survive, reproduce, and pass the successful variation to the next generation. These observations made a strong impact on his thoughts and in 1858-1859 Charles Darwin proposed what is now the theory for the origin of species by natural selection. We now refer to it as the theory of evolution.

Experiment:

A. Equipment and Materials - ruler, meter stick, graph paper, beans and you!

B. Procedure -

1. Variations among bean seeds - a. obtain a bag of bean seed

- b. measure the length in mm of each seed
- c. record your data on your data chart and on the class data report sheet
- d. collect the class data and make a graph of the number of seeds in each length category
- e. label your graph correctly, add color and spice

2. Variations among humans -

- a. Height
 1. with the help of another student measure your height in cm
 2. Record data as above
- b. Finger stretch
 1. stretch your right hand flat on your lab desk
 2. measure the distance in cm from the tip of your thumb to the tip of your little finger
 3. record data as above
- c. Elbow to Finger Tips
 1. measure the distance in cm from your elbow to the tips of your fingers
 2. record data as above
- d. Measure in cm arm reach, foot length, record as above



Data: Make perfect graphs!!! One for the seed data and one for the human data.

Conclusion: Intro - Unique beginning sentence; what you did and why?

Body - describe the shape of each of the graphs. Which character trait had the greatest variations, how do you know and why do you think this is so? Which character trait had the greatest variations, how do you know and why do you think this is so? If seeds store food for the growing embryo, which seed would likely have an advantage over the other seeds? Why? Would this trait help them survive? Exam your human traits in the same way you did the seeds. Does height, finger spread, arm spread, foot size, etc. have an advantage? Name some. How does a bell shaped curve fit into these lab results.

Summary - Where are the errors? How can this data be used