**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_**

**Variation in Populations**

***Background Information***:

Have you ever noticed that when members of the same species are compared many examples of variation are observed? When we use the term “species” we are referring to a group of organisms or individuals that are capable of interbreeding. The species being observed could be a dog or a cat or a planaria. Regardless of the species careful, or even casual, observations will show that not all of the individuals are the same. Why does this variety exist?

In this investigation, you will measure the variation in a specific trait and discover how this trait varies within a species.

***Pre-lab Questions:***

1. Write as many reasons as you can think of for the variation between individuals within a species.

1. Define the following terms:

mathematical ***mean***

mode

median

range

***Materials:*** Pencil, paper, metric ruler, graph paper, calculator, sunflower seeds

***Procedure:***

1. Use the table below to make a **frequency distribution chart** for the length of sunflower seeds.
2. Measure the shell length of each sunflower seed in the container to the nearest **millimeter**.
3. Record each length by making a tally mark under the appropriate length in the table.

**Lab Group Data: Number of Shells with Different Lengths for Group**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Length in mm | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 24 |
| Number of shells |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total shells with length |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Class Data: Number of Shells with Different Lengths for Class**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Length in mm | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 24 | Sum of total shells  ↓ |
| Number of shells |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total shells with length |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Calculations:**

1. Calculate the following using the Class Data. Show all of your work and include units.
   1. mean
   2. mode
   3. median
   4. range

**Graph:**

Make a histogram (bar graph) for the data. Shell length is on the X axis and Number of Shells is on the Y axis.

**Analysis:**

1. Summarize your data regarding variation in sunflower seed length. Include the terms, mean, mode, median, range as well as numbers.
2. Describe how a short seed length might contribute to survival of the species.

1. Describe how a long seed length might contribute to survival of the species.
2. Explain how ***variation*** in specific traits could benefit a population.