Biology 3201 Investigation 16A Variations Great and Small Gillam Holy Heart Name: _____

Diversity (variations) within a species can help populations survive environmental changes. Diversity within a species can be monitored genetically, or it can be demonstrated by measuring individuals within a population. Most traits in a population vary in a continuous way from one extreme to the other. A plot of the distribution of the trait in a population often produces a bell-shaped curve. In this investigation, you will design an experiment to measure a particular characteristic a population of sunflower seeds.

Question

Are there measurable differences in size among individuals of the same species?

Hypothesis

Make and record a hypothesis about how a particular characteristic might be distributed throughout a population. (For example, would it be evenly distributed with an equal amount in each frequency?)

Materials

• caliper • sunflower seeds • pencil • ruler

Experimental Plan

1. With your group, design an investigation to determine the variation in the length of sunflower seeds

2. State and record a hypothesis.

3. As a group take measurements.

Also decide whether to pool your data with other groups. (Keep in mind that the larger the sample size, the more reliable the results are.)

4. Design a table similar to the one shown in the sample to record data for each investigation.

5. Identify the variables that you will control to ensure that your data are reliable.

6. Show your experimental plan to your teacher before beginning your investigation.

Hypothesis (1 Mark)

_____

_____

_____

What might be a source of error in your experiment? (1 Mark)

_____

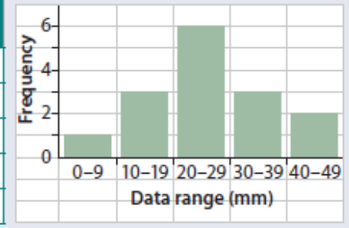
_____

Place Your Raw seed length data in the table below (2 Marks)

Seed Length (millimeters)			

Sample Data Table and Histogram

Data Range (mm)	Frequency
0–9	1
10–19	3
20–29	6
30–39	3
40–49	2



Create a frequency data table below to organize your data similar to the sample data table above. Choose appropriate intervals for your seed length (5 Marks)

Table 1.0 _____

Create a histogram as shown in the sample to display your data. (5 marks)

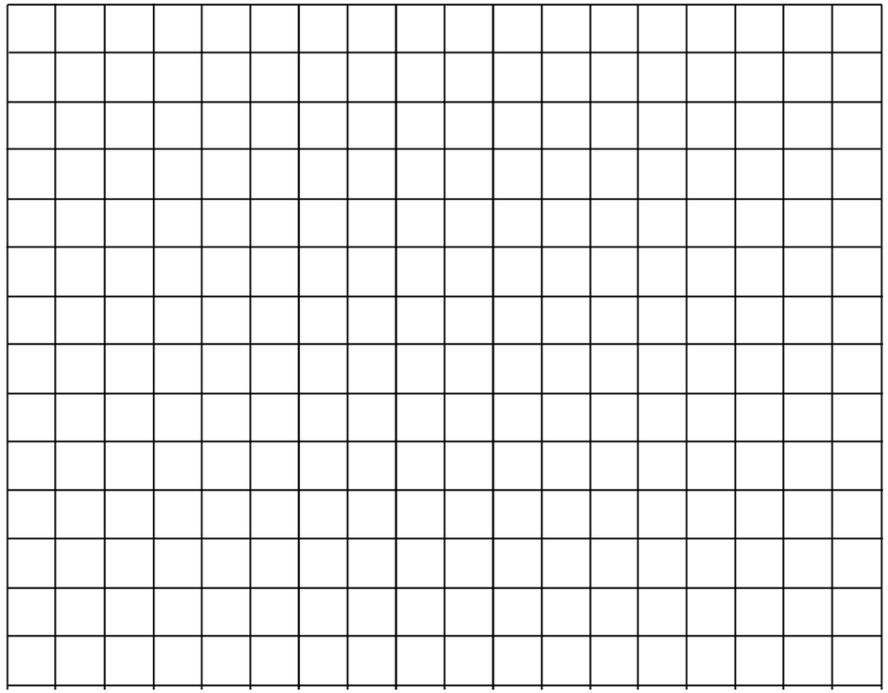


Figure 1.0 _____

Analysis

1.) What is the range of seed length in your data? (shortest and longest) (1 Mark) _____ to _____

Conclusions

2.) What can you conclude about the variations within a population? Is there a "typical" length? (1 Mark)

_____

_____

3.) Would you get a greater or smaller variation in the range of data if all of the individuals sampled came from the same parents—for example, if all of the seeds you measured originated from the same plant? (2 Marks)

_____

_____

_____

_____

4. What advantage would size (either large size or small size) have to the population studied? (For example, what advantage would large size have to a seed?) (2 Marks)

_____

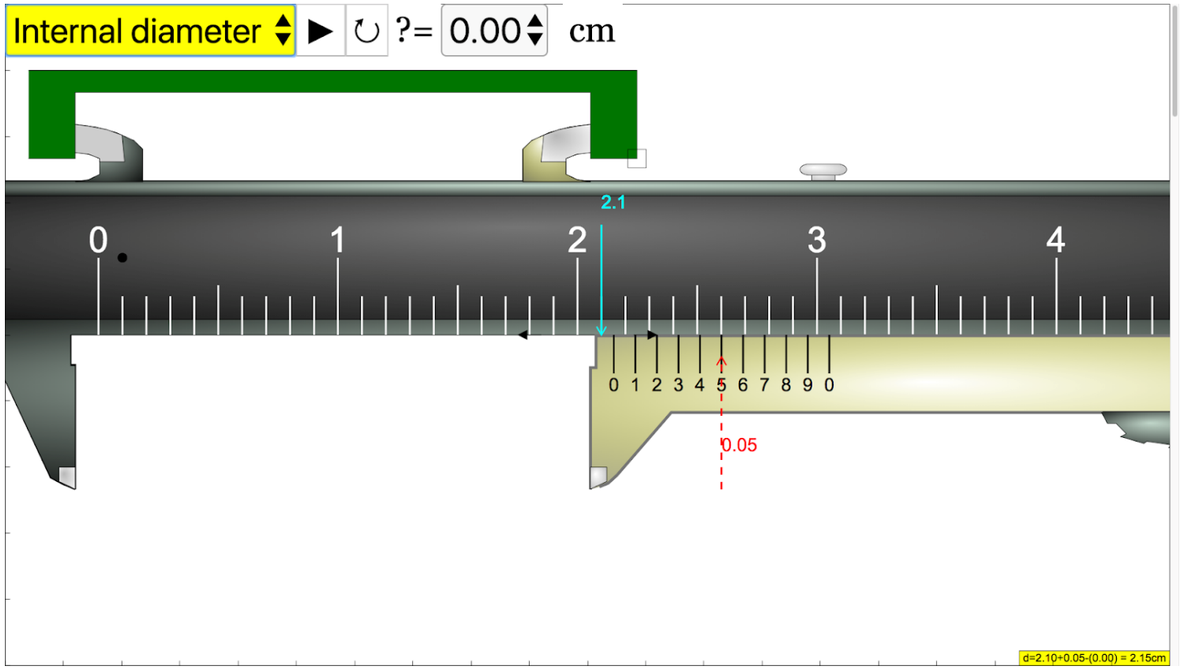
_____

_____

_____

_____

How to use a Caliper



If you look at 0, 1 ,2, 3, 4 they are not line up perfectly, but the 5 is.

On the bottom where you see 0.05, this line is exactly in line with line above it. This means this is the decimal place for your reading. This measure would be 2.15 cm or 21.5 mm.