

Purpose:

- To recognize the essential steps that should be followed when setting up an experiment.
- To learn the difference between observation and inference.
- To practice graphing skills.

A. A group of students wanted to know if birds choose the seeds they eat strictly by color. The students know the birds like to eat small, red sorghum seeds. They decide to use this type of seed in an experiment to find out which color the birds would choose if they had several choices.

B. The students attached a cupcake pan to a platform on the end of a long pole. They set up the pole at the end of a field near some trees. In one of the section of the cupcake pan, they placed twenty-five natural red sorghum seeds. Then, they used odorless and tasteless food coloring to color separate batches of the sorghum seeds yellow, blue, pink, and green.

C. Twenty-five seeds of each color were placed in separate sections of the pan on top of the pole. Each day for two weeks, the students counted how many seeds remained in each section of the pan. Each day they recorded the number of seeds missing (eaten). Each day they replaced the missing seeds so there would again be twenty-five seeds of each color in the pan. The table below shows the record of seeds eaten during a two week period.

Seed Eaten by Birds Over Two Weeks Period

| Seed Color | Time (days) | | | | | | | | | | | | | | Total |
|------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| Red | 23 | 24 | 23 | 24 | 22 | 20 | 20 | 23 | 23 | 24 | 25 | 23 | 22 | 24 | 320 |
| Blue | 18 | 21 | 12 | 11 | 12 | 14 | 8 | 11 | 5 | 7 | 9 | 12 | 10 | 7 | 157 |
| Green | 10 | 12 | 14 | 7 | 9 | 1 | 0 | 0 | 4 | 2 | 11 | 20 | 7 | 1 | 98 |
| Pink | 22 | 21 | 19 | 20 | 22 | 23 | 22 | 23 | 23 | 19 | 22 | 20 | 22 | 21 | 299 |
| Yellow | 5 | 15 | 7 | 2 | 4 | 6 | 5 | 8 | 4 | 1 | 2 | 7 | 5 | 4 | 75 |

Questions:

1. Write the scientific problem being studied in this experiment in question format?

2. List all the materials needed to perform this experiment.

3. List at least 5 variables that were left unchanged as a CONTROL:

4. What is the point of having so many controls in an experiment? -

Look at the data table and determine what is the:

5. independent variable-_____

6. dependent variable-_____

Using the data table, record 3 observations:

7. _____ - _____

8. _____ - _____

9. _____ - _____

10-12. Describe each observation on #7-9 by writing QN (quantitative) or QL (qualitative) at the end of each observation.

13. Make one inference from one observation recorded above.

14. Sometimes the results of an experiment raise other questions. Write a different problem using corn seeds.

15. How could you change the original experiment to control or restrict the size of the bird that could eat the seed?

16. The data table is what part of the scientific method? _____

17. What can be concluded from the results of the original experiment?

18. Construct a multiple line graph (5 lines on one graph) to show how many seeds of each color were eaten daily. Plot all red seeds first and connect with line. Repeat with each seed color. Color code each line and make a key. Use Graphing Notes.

19. Construct a bar graph to show the total seeds eaten by color. Color code the bars and make a key. Remember, bar graphs have spaces between bars.

20. Construct a circle/pie graph. Be sure to **show the work to calculate the angles & percentages**. Color code and label. Use Graphing Notes provided in cla

