Module 10: Classification - Diversity in the Six Kingdoms
Topic 2 Application: Carnation Color Scientific Investigation

Before you begin the scientific investigation below, be sure to download the *Carnation Color Scientific Investigation Report*. As you complete this scientific investigation, fill in any needed information on the report template. If you need more information about each section of the report, please visit the Developmental Module.

This scientific investigation is available below or in a printable version.

Introduction

Most plants take in water from their roots. The water travels up the stem of the plant into the leaves and flowers, where it makes food and helps the plant stay rigid. When a flower is cut off a plant, it no longer has the roots, but the stem of the flower still takes up water and provides it to the leaves and flowers.

Objective

In this scientific investigation, you will:

- simulate the capillary action of carnations using different food colors.

Hypothesis

Using the **Procedure and Data Collection** section below, read through the procedural information for this scientific investigation. Based on your understanding of the procedure, develop your own hypotheses which describe your expected results. You should consider the following questions: how will the food coloring affect the color of the white carnations? Will one of the colors create a deeper colored flower or do the colors all absorb to the same degree? Record your hypothesis in the **Hypothesis** section of the *Carnation Color Scientific Investigation Report.*

Equipment and Materials

- 8 white carnations
- Red, blue and green food coloring
- Scissors
- 4 plastic cups
- Marker

Procedure and Data Collection

1. Gather your materials.
2. Using the marker, label each of the cups 1 through 4.
3. Fill each of the cups approximately halfway with plain tap water.
4. Add 25 drops of red food coloring to cup 1, 25 drops of blue food coloring to cup 2, and 25 drops of green food coloring to cup 3.
5. Cup 4 should remain without any food coloring. This is your experimental control.
6. Using the scissors, trim the stems of the carnations approximately 1 inch from the bottom.
7. Place 2 carnations in each cup.
8. Observe your carnations every 4 hours for 24 hours. Examine each carnation carefully, including the stems, leaves, buds, and petals. Record your observations in the **Data** section of your *Carnation Color Scientific Investigation Report*.
9. After 24 hours, examine each carnation carefully, including the stems, leaves, buds, and petals. Record your observations in the **Data** section of your *Carnation Color Scientific Investigation Report*.

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Data

Use the tables provided in the **Data** section of your *Carnation Color Scientific Investigation Report* to record your data from this scientific investigation. The data tables are also shown below:

Observations During the Experiment				
Time	**Cup 1 Red Food Coloring**	**Cup 2 Blue Food Coloring**	**Cup 3 Green Food Coloring**	**Cup 4 Control**
4 hours				
8 hours				
12 hours				
16 hours				
20 hours				

Observations After the Experiment				
Time	**Cup 1 Red Food Coloring**	**Cup 2 Blue Food Coloring**	**Cup 3 Green Food Coloring**	**Cup 4 Control**
24 hours				

Data Analysis

In the **Data Analysis** section of the *Carnation Color Scientific Investigation Report*, provide responses to the following questions.

1. Using your knowledge of vascular tissues, why did the carnations change colors?
2. Which carnations changed color the quickest? Why did this happen?
3. How can this experiment help you better understand how water quality and pollution can affect our plants?

Conclusion

Using the **Conclusion** section of the *Carnation Color Scientific Investigation Report*, compose three-to-four sentences describing an overall conclusion based on your data. Explain why the carnations changed colors when added to water containing different food coloring. Use the data and notes that you collected from your investigation to form your conclusion. Be sure you include information that you gained from data analysis to support your conclusion.

Experimental Sources of Error

On your *Carnation Color Scientific Investigation Report*, provide responses to the following questions: **Are there any sources of error? If so, what are they, and what could be done to minimize error?**

Once you have completed the *Carnation Color Scientific Investigation Report*, please submit your work to the dropbox.