 **Lab Report 2:**

**Water Movement in Plants**

***Question:***

Water is an essential raw material for photosynthesis. Photosynthesis is how green plants convert light energy into chemical energy, in the form of food. So plants must be able to gather and transport water in order to survive. How does water make its way from the soil to the leaves of a plant? Blood is carried through your body in tubes called blood vessels. Are there similar structures in a plant?

***Hypothesis:*** [**2**]

***Materials:***

2 Stalks of Fresh Celery Red Food Colouring

Paring Knife Spoon or Stir Stick

2 × 200-mL Beakers Paper Towel

Medicine Dropper Ruler

Water

***Procedure:***

1. Obtain two celery stalks that are about the same length. Using a paring knife, cut approximately 1 cm from the end of each stalk. Be sure the paring knife is clean before you use it. Use care when cutting, and always cut away from yourself.
2. Use your fingers to remove the leaves from ***one*** of your celery stalks.
3. Half-fill two 200-mL beakers with water. Add five drops of red food colouring to the water in each beaker and mix well.
4. Place both celery stalks in the water. Leave them in the water for 3 hours.
5. After 3 hours, remove the celery stalks from the water. Lay both celery stalks on a paper towel. Use a ruler to measure the length of each stalk from the bottom end to where the leaves begin.
6. Use the paring knife to cut a cross-section of one celery stalk 1 cm from the bottom end. Examine the cut surfaces of the celery.
7. Continue cutting the celery stalk at 1 cm intervals until the dye can no longer be seen in the stalk. Repeat with the other celery stalk.
8. Dispose of the celery as directed by your teacher. Clean your glassware and return it to storage. Wash your hands.

***Observations:***

1. Make a table in your notebook to record your observations. Predict which celery stalk will show the greatest movement of water (and dye). Provide a reason for your prediction. **(2)**

|  |  |  |
| --- | --- | --- |
| **Water Movement in Celery** | | |
|  | **Stalk with Leaves** | **Stalk without Leaves** |
| Prediction |  |  |
| Length of stalk (cm) |  |  |
| Distance Moved: |  |  |
| 1 cm |  |  |
| 2 cm |  |  |
| 3 cm |  |  |

1. Draw a sketch to show where the red dye appears on the cut surface of the stalk. **(2)**
2. Record the total distance the dye moved in each stalk. **(2)**
3. Calculate the percentage of the stalk that the dye and water moved up, using this formula: **(2)**

Distance moved by the dye × 100%

Length of Stalk

***Analysis:***

1. What effect did the leaves have on water movement? **(2)**
2. How does water get from celery’s roots to its leaves? **(2)**
3. Explain why you started with two celery stalks that were about the same length. **(2)**
4. Why is it helpful to calculate a percentage in order to compare the movement of dye in the two stalks? **(2)**

***Conclusion:***

How does water make its way from the soil to the leaves of a plant? Blood is carried through your body in tubes called blood vessels. Are there similar structures in a plant? **(2)**

***Evaluation:***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Category** | **Level 4** | **Level 3** | **Level 2** | **Level 1** | **%** |
| **Observations** | The relationship between the procedure and what was observed is discussed in detail. All information is accurate. | The relationship between the procedure and what was observed is discussed. Most information is accurate. |  |  | 25 |
| **Diagrams** | Clear, accurate diagrams are included and make the experiment easier to understand. Diagrams are labeled neatly and accurately. | Diagrams are included and labeled neatly and accurately. |  |  | 25 |
| **Analysis** | The patterns in the observations are discussed and logically analyzed. Predictions are made about what might happen if part of the lab were changed or how the experimental design could be changed. | The patterns in the observations are discussed and logically analyzed. Some predictions are made. |  |  | 25 |
| **Conclusion** | Conclusion includes whether the findings supported the hypothesis, possible sources of error, and what was learned from the experiment. | Conclusion includes whether the findings supported the hypothesis and what was learned from the experiment. |  |  | 25 |