Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_

Bioflix Water Transport in Plants

<http://media.pearsoncmg.com/bc/bc_0media_bio/bioflix/bioflix.htm?8apwater>

Part I. Structures Involved in Water Transport in Plants. Describe the role of each of the following structures in water transport.

|  |  |
| --- | --- |
| Structure | Role |
| Roots |  |
| Root hairs |  |
| Waxy barrier in the root |  |
| Xylem |  |
| Small pores in the leaves |  |

Part II. What is transpiration?

Part III. What is the difference between adhesion and cohesion? Give examples of each in plant water transport.

Part IV. What is the transpiration-cohesion-tension mechanism? How does this mechanism explain how water and soil nutrients move from the roots of a plant to its leaves?

Plant Transpiration Virtual Lab

Go to the website: <https://www.classzone.com/books/hs/ca/sc/bio_07/virtual_labs/virtualLabs.html>

1. What is the operational definition for the rate of transpiration?
2. Write your predictions and later your results.

|  |  |  |
| --- | --- | --- |
| **Rank** | **Predictions** | **Results** |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |

1. How do your predictions compare with your observations?
2. Record data from lab notebook:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Conditions** | **0 min** | **10 min** | **20 min** | **30 min** |
| **Normal** | 1 mL |  |  |  |
| **Windy** | 1 mL |  |  |  |
| **Warm** | 1 mL |  |  |  |
| **Humid** | 1 mL |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Conditions** | **Total water loss (mL)** | **Total surface area of leaves (cm2)** | **Total surface area of leaves (m2)** | **Rate of transpiration (mL/m2)** |
| **Normal** |  |  |  |  |
| **Windy** |  |  |  |  |
| **Warm** |  |  |  |  |
| **Humid** |  |  |  |  |

1. For each environmental factor, explain why the rate of transpiration increased or decreased from the control conditions.

Windy-

Warm-

Humid-

1. Why is it important to calculate the surface area of the leaves?
2. Review the graph that you created. By how much did the rate of transpiration decrease for humid conditions?
3. Why do you think it is necessary to have an air-tight seal in the potometer?