Name:_____

OBSERVING WATER TRANSPORT IN A CELERY STALK

INTRODUCTION:

As water evaporates from the leaves of a plant, more water is drawn up by osmosis from the tissues below to replace it. The replacement of water lost through transpiration is possible because water molecules have polar covalent bonds. This causes one end of the molecule to have a slightly positive charge and the other end to have a negative charge. Because of this, the water molecules act like "small magnets". The positive end of one water molecule sticks to the negative end of another in a long chain that is pulled upward against the force of gravity.
When enclosed in a narrow tube, such as the transport vessels of a plant, water molecules can withstand a large force without being pulled apart.

MATERIALS NEEDED:

Celery stalk with leaves intact	Metric ruler
400-mL beaker	Distilled water
Glass bowl	Red food coloring
Razor blade	Stirring rod

PROCEDURE:

1. Fill the beaker with **100 mL** of distilled water. Add drops of red food coloring, stirring with the stirring rod, until the water is a dark red color. Set this aside.

2. Put some distilled water in the glass bowl. While holding the bottom end of the celery stalk under water, cut off the bottom two centimeters of the celery stalk.

3. Quickly place the freshly cut celery stalk upright in the beaker of colored water. Record the beginning time on your **DATA TABLE**

4. Allow the celery to remain in the food coloring until the color is visible in the upper stem and leaves. Record the ending time on your **DATA TABLE**, and remove from the beaker of food coloring.

5. Measure the length the red color traveled up the celery stalk in centimeters. Record on your **DATA TABLE**

Beginning time	
Ending time	
Length food color traveled up stalk (cm)	

CALCULATIONS:

6. Calculate the number of minutes it took for the coloring to reach the top. Time for color to reach the top of stalk. = _____ **minutes**

7. Calculate the **rate of travel** of the food coloring up the celery stalk in **centimeters per minute**.

$$\textbf{rate of travel} = \frac{\textbf{length of celery stalk (cm)}}{\textbf{time for color to reach top of stalk (min)}}$$

Rate of travel = _____ $^{cm}/_{min}$