

## **Activity-43: Absorption of water in Plants.**

**Aim: How do plants take-in water?**

### **Requirements:**

To perform this activity the following items are necessary.

1. Take 3 large glass or plastic tumblers.
2. A razor blade or an army knife. (Teacher supervision is must).
3. Eosin stain or red India ink and Methylene blue or Blue ink.
4. A glass rod or a small stick.
5. A piece of thread.
6. A plant with soft stem is preferred.
7. A hand lens or a microscope that can magnify 100 times (if available).
8. Plastic cover.
9. Refrigerator (if available).

### **Procedure:**

Uproot the plant very carefully from the soil. If there is a cut or tear in the stem discard the plant and take another. This is very important because air bubbles could be formed inside the stem and compromise the experiment.

Now fill the 3 glass/plastic tumblers each with water, red ink and blue ink respectively.

Immerse the stem in the filled tumblers and then cut them transversely/horizontally ( $0^\circ$ ) with the blade. Do not cut the stem outside the water as this could introduce air bubbles and compromise the experiment.

If the plant stem is not rigid, tie it to the stick and make sure the plant is upright.

This whole experiment should be repeated again with some changes. They are:

1. Cutting the stem diagonally. Try these angles:  $45^\circ$ ,  $60^\circ$ .
2. Placing the assembly in sunlight and in darkness for 10 hours.

Now take those stems and cut them near the tip (away from the site of initial cut that was immersed).

**Observation:**

What do you observe?

Do you observe the red or blue spots?

**PLANT KEPT IN SUNLIGHT:**

Angle of cut	Number of spots
0 degrees	
45 degrees	
60 degrees	

**PLANT KEPT IN DARKNESS:**

Angle of cut	Number of spots
0 degrees	
45 degrees	
60 degrees	

Try to scrap the leaf or cut it transversely. What do you observe? Do you observe the red or blue spots?

You could repeat the experiment placing it in the fridge and record your observations in a table like above.

You could also wrap the plant in a plastic cover and tie it to the stem and place in the sunlight. Record the observation in the table above.

### **Concepts Covered:**

Plants like us also have vessels called Xylem and Phloem. They are a network of tubes (capillary-like) through which water and food materials (dissolved) are transported or exchanged throughout the plant.

These tubes have a diameter ranging from 100 microns (0.1mm) to as small as 20-30 microns (0.02-0.03 mm) depending on the plant and the stage of development.

