

Water Festival Capillary Action Station

Teacher's Preparation:

Take 3 white carnations; cut the bottom of the stem on the diagonal; place in food coloring water for 3-4 days [red, green and blue]. Show the students how capillary action has moved the color from the water to the edges of the pedals.

Teacher's introduction to the material:

The plant draws water from the soil up through its stem to the leaves. The water evaporates from the leaves through openings know as stomata. As the water evaporates, it creates pressure that brings more water into the plant – similar to drinking from a straw.

Students see water's properties of adhesion and cohesion every day. The property of water which causes it to stick to other surfaces is called adhesion. Adhesion example: when you get out of the bath or shower, water droplets adhere to your skin. When you dry with a towel the water droplets adhere to the towel. Water molecules are attracted to one another in a property called cohesion. Cohesion example: when rain drops land on glass, do they run straight down, or do they zig zag; one droplet sticking to another? Together, the cohesive and adhesive properties draw water into the paper. Capillary action is defined as the movement of water within the spaces of a porous material due to the forces of adhesion, cohesion, and surface tension.

Plant cell walls are made of cellulose. Water molecules are very attracted to the cellulose molecules. The cellulose helps plants absorb water.

Paper is composed of cellulose fibers. The more cellulose used to make the paper the more water absorbent the paper will be. Colored construction paper is made by mixing old paper, cloth rags, and wood shavings with water until a soft wet mass is formed, which is pressed into sheets, dried and cut.

Paper Water Lily Instruction:

Have each student make a flower model from construction paper and observe how capillary action causes the flower petals open when placed on water.

1. Have each student trace the flower stencil onto construction paper.
2. Cut out the flower and cut a small slit in the center of the flowers. [The slit helps start the capillary action.]
3. Fold the petals of the flowers toward the center.
4. Set the flower on the water and watch the petals open.

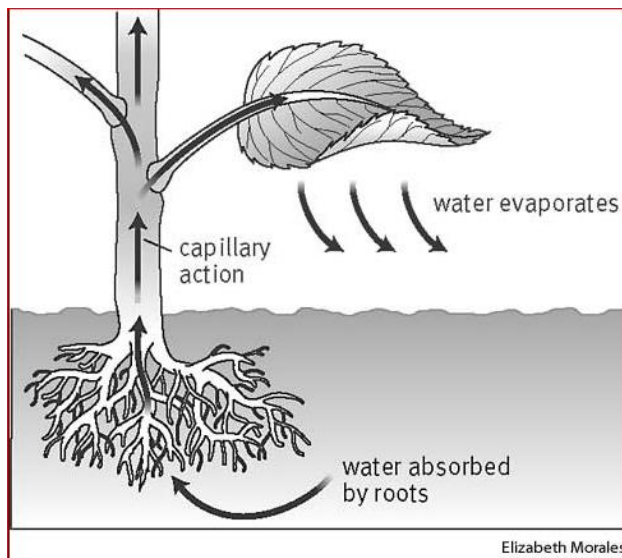
Skills: Physical Science

Vocabulary: Adhesion, Capillary Action, Cellulose, Cohesion, Evaporate, Translocation, Transpiration

Capillary Action

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Adhesion is the property of water which causes it to stick to other surfaces.

Cohesion is the attraction that water molecules have for one another. As the water evaporates from the plant leaves (transpiration), more water molecules are pulled in at the roots; thus, a continuous flow of water enters the roots and rises up the plant, bringing necessary nutrients dissolved in the water to the plant.

Capillary action is the rising of a liquid in small tubes because of adhesive and cohesive forces. This upward movement of water against the downward pull of gravity is the result of capillary action and transpiration. Capillary action brings water up to the leaves of a plant with the help of adhesion and cohesion.

Evaporation takes place when liquid turns into gas.

Translocation- is the movement of water from the roots to the leaves.

Transpiration is the evaporation of water through leaf pores called **stomata**.

