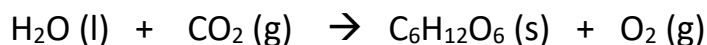


Transpiration Lab

Background Information

Plants absorb water, H₂O, through their roots and use capillary action to transport water to their leaves. On the underside of leaves are small openings called stoma (plural) or stomata (singular) through which plants breathe in carbon dioxide gas, CO₂, and breathe out oxygen gas, O₂. During photosynthesis, light energy is used to chemically combine water, H₂O, and carbon dioxide, CO₂, to produce glucose sugar, C₆H₁₂O₆, and oxygen, O₂.

Photosynthesis Reaction



During the day, while the stomata are open, not only is carbon dioxide and oxygen gas exchanged, but water in the leaves is subjected to heat from the atmosphere and evaporates out through the stoma, in a process called transpiration. The evaporation of water from the leaves, during transpiration, is what pulls the water up from the roots into the leaves, with the help of capillary action within the plant stems.

Goal

During this lab, you will be able to view stomata on the underside of a leaf and observe transpiration or water from a plant.

Observing Transpiration

1. Obtain a small plant.
2. Place a plastic bag over the plant and ensure that the plastic bag is closed by placing a rubber band around the bag and container of the plant.
3. Place the enclosed plant under a light, turn on the light and let the plant sit there for 45 minutes.
4. Turn off the light, without moving the plant, allow the bag to cool and observe what happens inside the bag.
5. Record your observations:

6. Were there any water droplets in the bag before you placed it on the plant? _____

7. Where did the water droplets come from? _____

8. Which process in the water cycle caused the water to leave the plant and collect inside the bag?

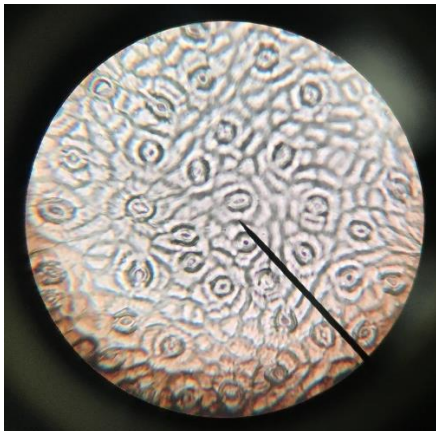
9. Why did you have to turn off the light and wait for the bag to cool before seeing any water droplets?

10. Which process in the water cycle allowed you to be able to see the water droplets?

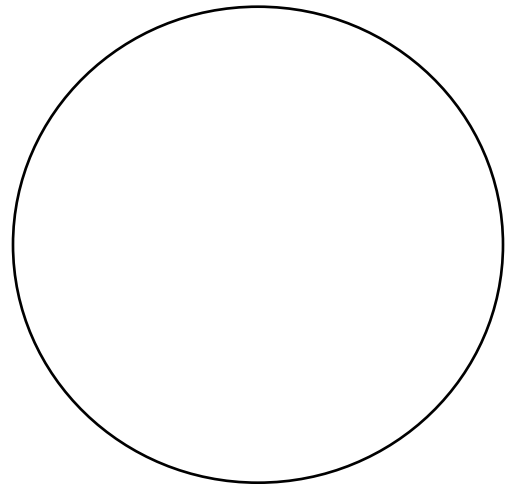
Observing Stomata

1. Obtain a leaf and use clear nail polish to paint a 1 cm by 1 cm square on the underside of the leaf. Try not to make the nail polish too thick, as it will take a lot longer to dry. You can blow on the leaf and wave it about a bit, to help it dry faster.
2. Once the nail polish has **completely** dried, carefully place a clear piece of tape over the nail polish without leaving any fingerprints.
3. Rub your fingernail over the tape to make sure it is stuck to the leaf.
4. Carefully peel off the tape from the leaf. The nail polish should now be stuck to the tape.
5. Place the tape onto a microscope slide.
6. View the slide under a microscope, beginning with the lowest magnification and working your way to the highest magnification.

What you should see:



Draw what you do see:



Draw an arrow to a stomata opening and label it