

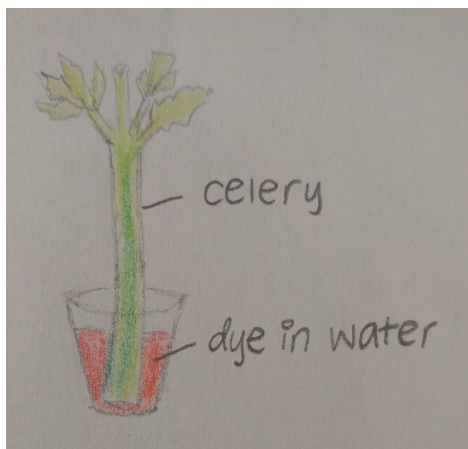
Aim: to observe the transpiration pathway in a celery plant.

Hypothesis: The water will enter through the xylem in the vascular bundle. It will travel up the celery until it reaches the leaves. In the leaf it will travel into spongy cells by osmosis. Then the water will travel into the air spaces by diffusion and will leave the plant through the stomata by transpiration.

Method:

1. half fill a cup with water
2. add 5 drops of red food colouring (or any colour but not green)
3. cut the bottom end of a clearly stem with a knife
4. stand the stem in the coloured water
5. leave for an hour and observe
6. leave for a further 24 hours and observe again

Diagram:



After 1 hour

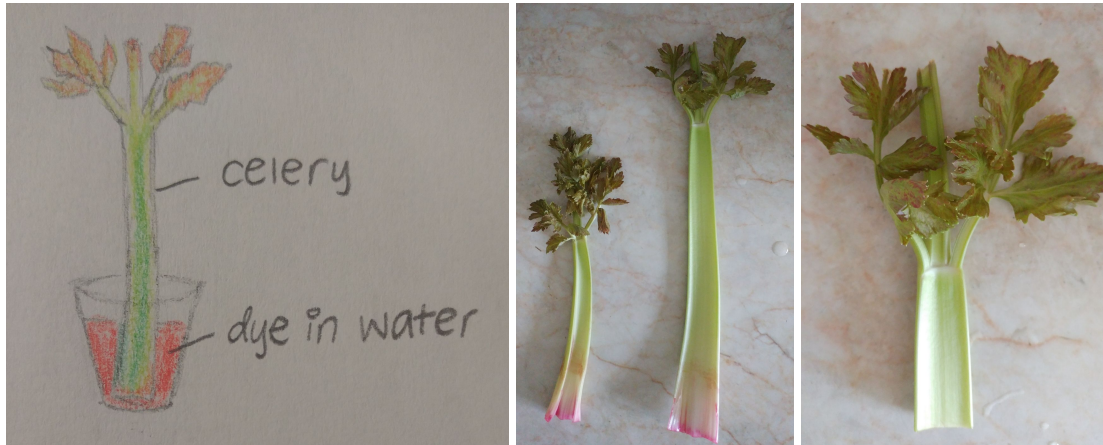


After 24 hours



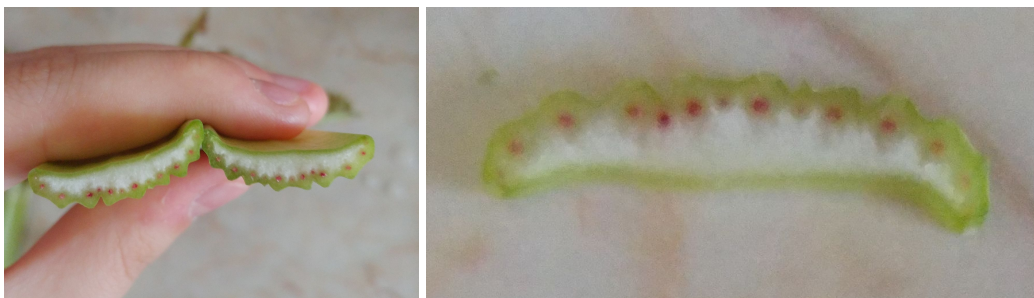
After 36 hours

Results:
part 1



- The leaves turned red after the celery was placed in the water with the food colouring.

Part 2



- The dye is highlighting the xylem vessel in the vascular bundle
- The xylem vessel carries water up the celery
 - the dye is carried in this water as it dissolved in water.

Conclusion: The water entered the celery through the xylem in the vascular bundle. It travelled up the celery until it reached the leaves as the dye dissolved in water highlighted the xylem. The xylem carries water and minerals up the celery and the water carried the dye. In the leaf, the water with red dye travelled into spongy cells by osmosis. The water travelled into the air spaces by diffusion. Also, the water vapour evaporated from the surface of spongy mesophyll cells into air spaces. Then the water left the plant through the stomata as water vapour by transpiration. The water vapour left through the stomata as the waxy cuticle is impermeable to water. This is proved as the leaves turned red after placing the celery in the water with red dye. This supports my hypothesis.