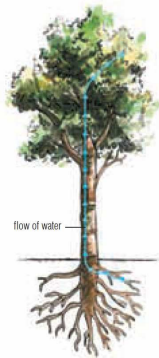


SNC2D BIOLOGY

TISSUES, ORGANS & SYSTEMS OF ...
☛ Plant Systems Working Together
(P.72)

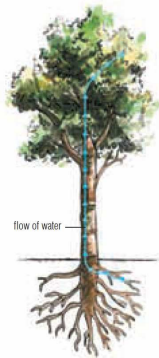
Plant Systems Working Together

To understand the interdependence between the shoot and root system, consider how water is transported through a plant. Both the roots and the shoots play a role in moving water from the roots through the plant to the leaves.



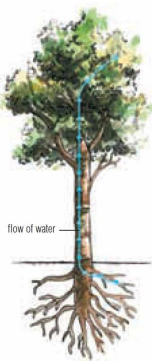
Plant Systems Working Together

A plant's roots can push water up the stem. However, the roots can only push the water a few metres and many plants are over 100 m tall. Water enters the root hairs and travels to the xylem. Once the water is in the xylem, it is moved against gravity up the stem to the leaves through transpiration.



Plant Systems Working Together

Transpiration is the evaporation of water through the stomata in the leaves. As each water molecule evaporates, it creates a transpiration pull on the adjacent water molecules, which pulls the water up the xylem to the leaves. Once the water reaches the leaf, the transpiration pull is enough to move the water from the xylem into the ground tissue.



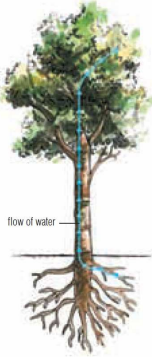
flow of water

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Plant Systems Working Together

The leaves lose a high proportion of the water because of evaporation through the stomata. This evaporation maintains the transpiration pull, and water is continuously drawn up the stem.

water → root hairs → xylem
→ transpiration pull → leaves
→ ground tissue

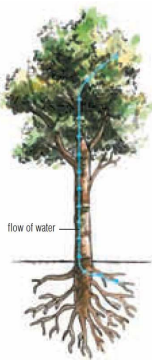


flow of water

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Plant Systems Working Together

The organs of a plant also work together to ensure that the plant survives changes in the environment. For example, some specialized cells record changes in the exposure to light. When the length of daylight increases, chemical messages are delivered to tissues to stimulate the production of a flower. Sometimes, in times of drought and excessive heat, a plant may decrease its production of leaves.



flow of water

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Plant Systems Working Together

PLANT ORGAN SYSTEMS

- ❖ perform basic life functions
- ❖ work together to ensure that the plant survives changes in the environment
- ❖ both the roots and shoots play a role in moving water from the roots through the plant to the leaves

water → roots → xylem → transpiration pull → leaves → ground tissue

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Check Your Learning


1. How do the root and shoot systems of a plant act in an interdependent way? (i.e. consider how gas exchange occurs in a leaf?)

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Check Your Learning

Gas Exchange in a Leaf

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 **Check Your Learning**

Gas Exchange in a Leaf

↓

water is carried up from the roots through the vascular tissues through the stem to the leaves


↓

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↓

↓

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 **Check Your Learning**

Gas Exchange in a Leaf

↓

water is carried up from the roots through the vascular tissues through the stem to the leaves

↓


carbon dioxide enters through the stomate (an opening in the epidermal tissue) in the leaf

↓

↓

↓

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 **Check Your Learning**

Gas Exchange in a Leaf

↓

water is carried up from the roots through the vascular tissues through the stem to the leaves

↓

carbon dioxide enters through the stomate (an opening in the epidermal tissue) in the leaf


↓

in the mesophyll tissue of the leaf, photosynthesis takes place, using sunlight, carbon dioxide, and water, to produce oxygen and sugar

↓

↓

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 ✓ Check Your Learning

Gas Exchange in a Leaf

↓

water is carried up from the roots through the vascular tissues through the stem to the leaves

↓

carbon dioxide enters through the stomate (an opening in the epidermal tissue) in the leaf


↓

in the mesophyll tissue of the leaf, photosynthesis takes place, using sunlight, carbon dioxide, and water, to produce oxygen and sugar

↓

the oxygen and excess water exit the leaf through the stomate

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 ✓ Check Your Learning

WIKI (BIOLOGY)

🔍... 2DBIOL - QUIZ4 (Chapter 3) 📄 omit Q.2,11,15,17,19,21,22

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