

INKBIOLOGY FLASHCARDS

Plant transport and mineral nutrition

Unit B08 · 14 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions in mark-scheme wording, and the misconceptions that lose marks. These cards and each lesson's whole-lesson check run on the website with spaced-repetition scheduling, at inkphysics.co.uk/biology/flashcards.

DEFINITION

Define: Root hair cell.

XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE XYLEM

DEFINITION

Define: Apoplast pathway.

DEFINITION

Define: Symplast pathway.

XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE XYLEM

DEFINITION

Define: Casparian strip.

SPOT THE ERROR

Say what is wrong with this claim:

Water is pushed up the stem by root pressure.

XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE XYLEM

DEFINITION

Define: Transpiration.

DEFINITION

Define: Transpiration stream.

TRANSPIRATION: THE PRICE OF KEEPING THE STOMATA OPEN

DEFINITION

Define: Stoma.

TRANSPIRATION: THE PRICE OF KEEPING THE STOMATA OPEN

DEFINITION

Movement of water through the cellulose cell walls and the spaces between them, without entering the cytoplasm of any cell.

XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE LEAF AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE LEAF

DEFINITION

An epidermal cell of the root extended into a long narrow projection, giving a large surface area for the absorption of water and mineral ions.

DEFINITION

A band of suberin in the walls of the endodermal cells that is impermeable to water, so the apoplast route is blocked and water must cross a plasma membrane.

XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE LEAF AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE LEAF

DEFINITION

Movement of water through the cytoplasm of the cells, passing from one to the next through plasmodesmata.

DEFINITION

The loss of water vapour from the aerial parts of a plant, mainly through the stomata, by evaporation from the mesophyll cell walls followed by diffusion out of the leaf.

TRANSPIRATION: THE PRICE OF KEEPING THE STOMATA OPEN

SPOT THE ERROR

Root pressure reaches perhaps 100 to 200 kPa, enough for ten or twenty metres, and it disappears if the roots are chilled. Xylem sap in a tall tree at midday is under tension, not pressure: the column is pulled from the leaf, not pushed from the root.

XYLEM AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE LEAF AND THE TRANSPIRATION STREAM: THE PULL COMES FROM THE LEAF

DEFINITION

A pore in the epidermis, bounded by two guard cells, through which gases and water vapour pass.

TRANSPIRATION: THE PRICE OF KEEPING THE STOMATA OPEN

DEFINITION

The continuous movement of water from the soil, through the root and up the xylem, to replace the water lost from the leaves.

TRANSPIRATION: THE PRICE OF KEEPING THE STOMATA OPEN

SPOT THE ERROR

Say what is wrong with this claim:

Transpiration is how a plant transports water and minerals to its leaves, so the pull is the point of it.

TRANSPIRATION: THE PRICE OF KEEPING THE STOMATA OPEN

DEFINITION

Define: Sieve tube element.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN T

DEFINITION

Define: Sieve plate.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN T

DEFINITION

Define: Companion cell.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN T

DEFINITION

Define: Translocation.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN T

SPOT THE ERROR

Say what is wrong with this claim:

Sugars are actively transported along the phloem from the leaves to the roots.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN T

DEFINITION

A living cell of the phloem, joined end to end with others into a tube; at maturity it has no nucleus, few organelles and only a thin layer of cytoplasm around the edge.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN TRANSDUCION: THE PRICE OF KEEPING THE STOMATA OPEN

SPOT THE ERROR

It is a cost, not a purpose. A plant loses 95 to 99 per cent of the water it takes up, and no system evolves whose main output is losing nearly everything it collects. Stomata open for carbon dioxide and water leaves through the same pores.

DEFINITION

A cell alongside each sieve tube element with dense cytoplasm, a nucleus and many mitochondria, connected to it by numerous plasmodesmata and responsible for loading it and keeping it alive.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN TRANSDUCION: THE PRICE OF KEEPING THE STOMATA OPEN

DEFINITION

The perforated end wall between two sieve tube elements, through which the sap passes.

SPOT THE ERROR

Active transport happens at the ends, loading at the source and unloading at the sink. A mature sieve tube element has no nucleus and few organelles and could not power transport along a metre of stem. In between it is bulk flow down a pressure gradient.

PHLOEM AND TRANSLOCATION: PUMPED AT THE ENDS, FLOWING IN TRANSDUCION: THE PRICE OF KEEPING THE STOMATA OPEN

DEFINITION

The transport of assimilates, mainly sucrose, through the phloem from a source to a sink.