

Solutions

Each answer shows the steps, then the **result**.

2.1

- transpiration is the **loss of water vapour from the leaves**

2.2

- higher wind speed **increases** the transpiration rate

3.1 B

- transpiration is fastest when it is **hot, windy and dry**
- A, C and D all slow it

3.2

(a)

- water **evaporates** from wet mesophyll cells into the air spaces
- water vapour **diffuses out through the stomata**

(b)

- higher temperature makes water **evaporate faster**
- so more **diffuses out**

3.3

- as water leaves the leaf it **pulls more water up** behind it
- water molecules stick together and are drawn up the xylem as a **column**

3.4

(a)

- B**: moving air blows vapour away, keeping the gradient **steep**
- C**: higher temperature gives more energy, so evaporation and diffusion are **faster**
- D**: the bag traps vapour, so the gradient is almost gone and **almost no water leaves**

(b)

- almost all the mass lost is **water leaving through stomata**
- so mass lost per hour measures **transpiration**

(c)

- absorbed by root hairs by **osmosis**
- travels up the stem in the **xylem**
- evaporates from mesophyll and **diffuses out through stomata**

(d)

- same shoot / same leaf area
- same time and **light intensity** (stomata)