Year 10 Science: Water in ecosystems: soil, plants and transpiration

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Give three ways a plant uses the water its roots take up.

2. Why does a plant on a hot, windy day need more water from the soil?

3. Why can soil rich in organic matter support more life than sandy soil?

4. In the stream transect, which reading would you expect to change most after two weeks of heavy rain, and why?

5. Explain how overfishing of snapper can lead to the loss of a kelp forest.

Fix the mistake

6. Correct this statement: "Plants keep most of the water their roots take in and use it for photosynthesis."

7. Correct this statement: "Transpiration is the plant sweating out water through its roots."

8. Correct this statement: "Clay soil is the best soil because it holds the most water."

9. Correct this statement: "Water and nutrients flow through an ecosystem and are lost, the same as energy."

Answer key (for parents and tutors)

1. Give three ways a plant uses the water its roots take up.
   Any three: photosynthesis, carrying dissolved minerals, keeping cells firm for support, cooling the leaves.
2. Why does a plant on a hot, windy day need more water from the soil?
   Transpiration is faster when it is hot and windy, so it loses more water from its leaves and must replace it through its roots.
3. Why can soil rich in organic matter support more life than sandy soil?
   Organic matter holds more water and nutrients, so more plants grow, which feeds more animals; sandy soil drains and dries quickly.
4. In the stream transect, which reading would you expect to change most after two weeks of heavy rain, and why?
   Soil moisture, especially further from the stream, because rain soaks the drier soil; the plant species take much longer to change.
5. Explain how overfishing of snapper can lead to the loss of a kelp forest.
   Snapper eat kina; with fewer snapper, kina numbers rise and they graze the kelp until only bare rock is left.
6. Correct this statement: "Plants keep most of the water their roots take in and use it for photosynthesis."
   Most of it is lost as water vapour through the stomata by transpiration; only a small fraction is used in photosynthesis.
7. Correct this statement: "Transpiration is the plant sweating out water through its roots."
   Transpiration is water evaporating from inside the leaves and escaping through the stomata, which pulls more water up the xylem from the roots.
8. Correct this statement: "Clay soil is the best soil because it holds the most water."
   Clay can become waterlogged and starve roots of air, so loam rich in organic matter, which holds water and still drains, suits most plants best.
9. Correct this statement: "Water and nutrients flow through an ecosystem and are lost, the same as energy."
   Energy is eventually lost as heat, but water and nutrients are recycled again and again between living things and their surroundings.