



01

The leaves of plants often grow in a circular pattern such that the leaves on top are not positioned directly above the leaves below them.



- (a) What are the function(s) of the leaves on a plant ?
- (b) How does this arrangement of leaves help to ensure that they can carry out their function(s) effectively ?
 - (a) Leaves make food for the plant.
 - (b) The leaves do not overlap one another so that the leaves of the bottom can also get enough sunlight to make food.







The roots hold a plant firmly to the ground and also absorb water and mineral salts from the surroundings. In the case of mangrove plants growing in swampy areas, the entire plant is raised above ground level by the branching roots. Some of the ends of the roots even stick out of the soil.



- (a) Why are mangrove plants lifted above ground level by the prop/stilt roots ?
- (b) Mangrove swamps have soils that are soaked with water and do not contain much air. By relating to this statement predict the function(s) of the root ends that stick out above the soil.
 - (a) The roots lift the plants high above the ground to prevent them from being covered by the water during high tides.
 - (b) The root ends that stick out above the soil take in air from the surroundings. Roots also require air to survive and the waterlogged soils do not have enough air.







The stems of most plants can be found above the ground. However, some plants have large, bulging stems that grow underground instead.

When these plants are placed in a dark container for seven days, the plants do not wilt and die. Instead, their underground stems appear to have shrunk slightly.



- (a) State the function(s) of a typical plant stem.
- (b) Explain why the underground stems appear to be smaller after the plants are kept in the dark for several days.
 - (a) A typical plant stem is used to suppot the plant to allow it to get maximum exposure to sunlight.
 - (b) The underground stems store food reserves. When the plants are placed in the dark, the leaves cannot make food, so the plants use the food reserves stored in the underground stems.







- A typical plant consists of several leaves, a stem and a root system. Occasionally, flowers and fruits may be found on the adult plant. All these parts must function together so that the plant can survive, grow and reproduce.
- (a) Explain what could happen if all the leaves of a plant are removed.



- (b) Explain what could happen if a section of the stem is clipped very tightly with a metal clip for several days.
- (c) With reference to your answers f or plants (a) and (b), explain why it is important for a typical plant to have its leaves, stem and roots functioning properly.
 - (a) The plant will not be able to make food.
 - (b) Water cannot be transported to the leaves and the plant cannot make food. Food made by the leaves cannot be transported to the lower parts of the plant, resulting in the slow death of the plant.
 - (c) The roots hold a plant firmly to the ground and take in water and mineral salts which can be transported by the tubes in the stem to all parts of the plant. The stem also holds the leaves up to get sunlight so that they can made food. The food made by the leaves is in turn transported by the tubes in the stem. All these three parts work together to allow the plant to survive, grow and reproduce.







The leaves of plants living in a desert are often thick and fleshy, while the leaves of plants in a tropical rainforest are usually thin, with pointed or round tips and smooth waxy surfaces.



How do these differences in leaf structures help the plants to survive in their respective living environments ?

Plants living in a desert do not have a regular supply of water. As such, the thick and fleshy leaves allow the plant to store water for use during long periods without rain. Plants in a tropical rainforest often experience heavy rainfall. The pointed/round tips and smooth waxy surfaces allow the rainwater to run off easily. The thin leaves allow more sunlight to pass through so that the leaves of the bottom can also get enough sunlight to make food.

