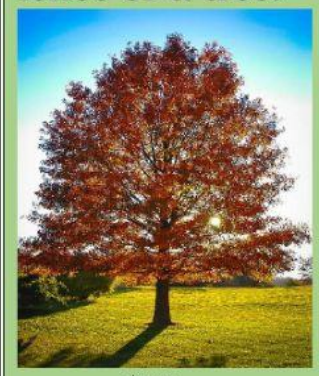
PLANT GROWTH & RESPONSES



To grow and be healthy every living thing needs certain things from its environment. Plants need light, water, oxygen, carbon dioxide, minerals, proper temperature and enough space in which to grow. Different plants have different growth patterns. Trees, vines and shrubs grow differently. A **tree** is a plant that has one main woody stem or truck. A **shrub** is usually a middle sized plant that has many stems or trunks. A **vine** is a plant with a climbing stem that may grow on the sides of a building, fence or a tree.



tree



shrub



vine

Growth-rate is also different for the different plant types. Some plants grow only during the wet seasons. Others grow all year round. Growth-rate also can be controlled by changes in the environment. Like all living things, plants respond to things in the environment. Plants respond to a variety of things (stimuli) such as light, gravity and water. A plant's response that involves growth is a "tropism". Plants bend towards light as they grow. The growth response of a plant to light is called "**phototropism**".



Plant bending towards the light



Roots grow in the direction of gravity and to get water

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Responses to gravity and water also help plants survive. A stem responds to gravity by growing in the direction opposite to the pull of gravity. When stems grow upward, leaves can get light. Roots respond to gravity by growing in the direction of the pull of gravity. The downward growth of roots helps the roots reach water in the ground. Roots also respond by growing towards the water itself (**hydrotropism**). A plant's response to gravity is called "**gravitropism**".

Plants that live in different environments have different adaptations. Pine trees grow where there is little rainfall. Pine trees have needle like leaves. These leaves have a small surface area so pine trees do not lose much water through their leaves. The cactus plant has long roots that spread out just below the surface. They can absorb water quickly after it rains. The thick stems of the cactus store the water that is used during the long, dry spells. Some wild plants, like locoweed, produce poisons to prevent animals from eating the leaves. This prevent the growth of young plants. New plants do not grow around that tree. This poison is an adaptation because there are no new plants to compete with the tree for space. Some leaves are covered with wax to prevent water loss.


Pine trees with needle life leaves to prevent water loss


Cactus have thick stems to store water

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