



GERMINATION



The shoots of these coconut seedlings have grown out after the roots have grown into the sand.

WHEN THE ROOT GROWS

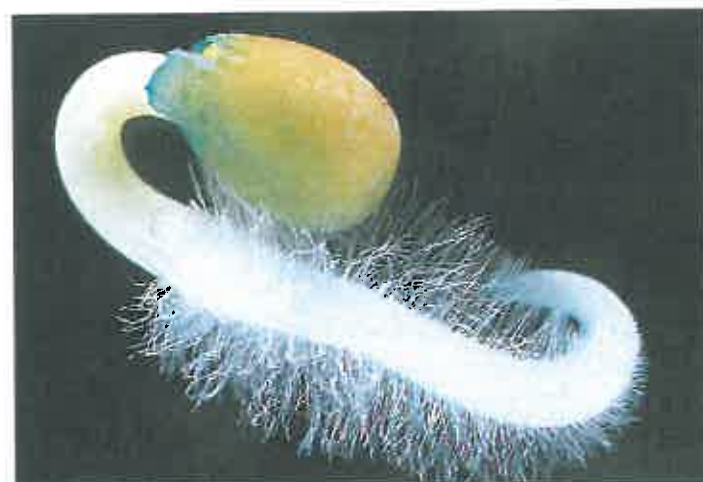
The part of the embryo plant to grow first is the root. It bursts out of the seed coat and grows down into the soil. Water passes into the plant through the surface of the root. Hairs grow out of the root to increase the surface for taking up water so that plenty of water can be taken in for the rapidly-growing plant.

When the conditions are right, the tiny embryo plant inside the seed takes in water and begins to grow. We say the seed germinates.

WHY SEEDS NEED WATER

In the dormant seed, the cells of the embryo plant are resting and little water is needed for them.

When the embryo plant begins to grow, new cells are produced which need water to keep them alive so more water is taken into the seed. The water also lets the food move from the food stores to the embryo plant to help it to grow.



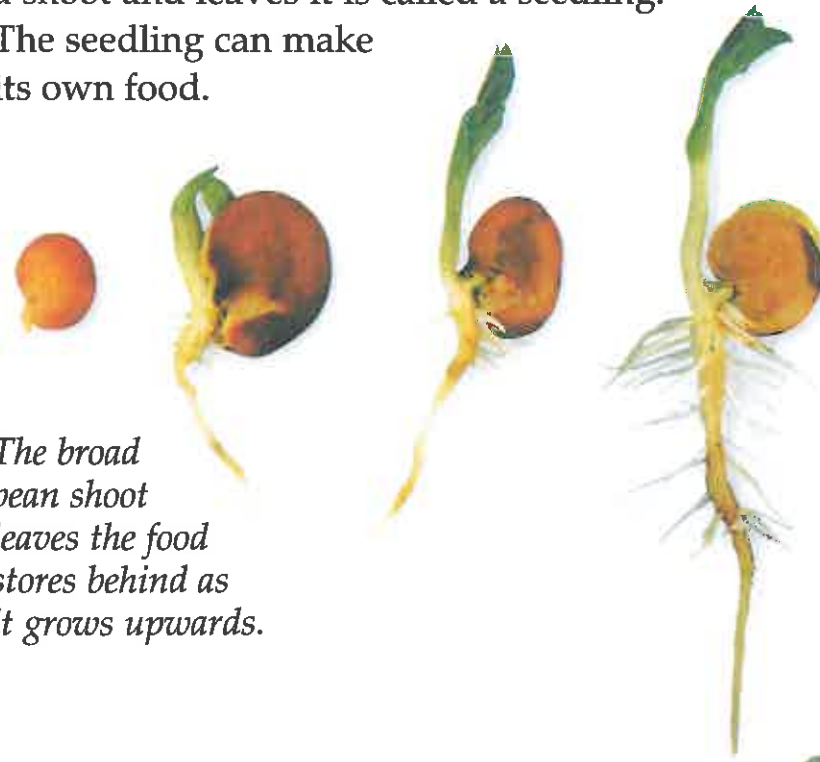
The root of this mustard seed grows out through the broken seed coat and sprouts hairs to collect water from the soil.

THE FIRST SHOOT

There are two ways in which the shoot of the embryo plant may grow. In some plants, like peas and beans, the shoot may grow out from between the food stores and push upwards through the soil and into the air.

In plants like the sunflower the shoot takes the food stores with it as it grows through the soil. When the shoot reaches the air the food stores turn green and become the first leaves.

In both kinds of plant, when the plant has grown a shoot and leaves it is called a seedling. The seedling can make its own food.



The broad bean shoot leaves the food stores behind as it grows upwards.



The leaves on this sunflower seedling are formed from the food stores which were inside the seed.