

PIONEERING *Plants*

Land plants have been around for hundreds of millions of years—and they’ve been busy.

Plants have evolved some **simply amazing adaptations**: They move water to great heights. They transform rock into soil. They grow big—sometimes huge. They attract animals to help them move and reproduce. And they put the “food” in food webs, using the sun’s energy to make sugar from water and carbon dioxide.

Come explore some of the highlights of plants’ fascinating story!



Smithsonian Gardens

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Some of Earth’s early land plants may have looked a bit like this modern crescent-cup liverwort.

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Now-extinct *Archaeopteris* (in foreground) had fern-like leaves that bore spores and was the first tree to have a woody trunk. It had spread far and wide by 390 million years ago.

Archaeopteris minor

Plants Move Ashore

Earth’s earliest life evolved in water—so land was a challenging place.

Plants were pioneers: they moved to land more than 100 million years before early backboned animals hauled themselves out of the muddy shallows to the shore.

The earliest land-dwelling plants, like their descendants, **retained water with a waxy outer coating**. But they grew only in **low, sprawling green mats** on moist surfaces—they couldn’t get tall without a way to move water up.

Plants Grow Up

Land plants didn’t stay small.

Some species evolved a system of connected tubular cells called xylem. Water could now move **straight up** through these tubes: from the roots through the stem to the leaves.

Later, some plants evolved **woody tissues** that could support **thick trunks and heavy branches**. These were some of the world’s earliest trees.