

Chapter 16

ENRICHMENT

Use with Section 1

● Introduction to Plant Reproduction

The Ancient Cycads

Cycad trees are probably the most ancient seed-bearing plants on Earth. Scientists know that they lived long before the dinosaurs—almost 300 million years ago—and that they made up a good percentage of the forests where dinosaurs lived. But unlike the dinosaurs, cycads aren't extinct.

People often call cycads palm trees, because that's what they look like. They have a long trunk, no branches, and a plume of feather-like leaves at the top. But palm trees have no growth rings. Cycads do. The leaves look like the leaves of ferns. As cycad leaves begin to develop, they are curled up, just like a fern. But ferns don't have the tall trunk of a cycad. And ferns use spores to reproduce. Cycads don't.

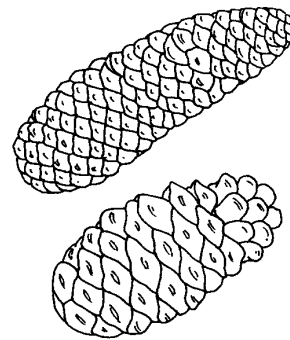
In fact, no matter what a cycad looks like, botanists say that cycads are most closely related to pine trees. That's because cycads produce male and female cones, just like pine trees do. But there's one big difference. Pine trees produce male and female cones on the same tree. Cycads don't. Instead there are male trees and female trees. A plant that produces separate male and female plants is called *dioecious*. (You may be familiar with another dioecious plant, mistletoe.)

Both a male and a female cycad produce cones, which usually form at the center of the spray of fronds. The cones look like large pine cones. Some can be as long as 1 m and may weigh up to 33 kg! Most are colored in bright reds, yellows, and purples. As the cone matures, the scales dry and pull away from the cone. In male cones, this releases the pollen. The seeds in the opened cone on the female plant can then receive the pollen.

Once botanists thought that cycads depended on the wind to spread pollen. However, cycads grew in the lower levels in forests, where there would be little wind, so that theory didn't sound correct. Today, botanists theorize that cycads depended on small beetles and bees to carry the pollen from one tree to another. Birds and animals are attracted to the bright seeds, which is how the seeds are dispersed.

Cycads are tough. They can withstand long periods of drought. Some, like cycads native to Florida, thrive in sandy soil. Others live where the soil and the water are salty. Still others live in mountainous areas that receive frost and heavy snow. Most cycads, however, live in tropical and subtropical areas.

Nonetheless, cycads are endangered. They take a long time to reproduce and then grow slowly. (That may be one reason why they live so long—some as much as 2500 years!) The biggest threat is losing habitat. Another is poaching. In South Africa, for instance, cycads are protected and so are the places where they grow. In 1998, the government set up Operation Jurassic to stop people from stealing wild cycads and selling them illegally. Smuggling and collecting cycads has become a huge business. In one year a dealer arrested by the Operation Jurassic team earned over \$165,809 selling stolen cycad trees!



Answer the following questions, using complete sentences.

1. What is meant by dioecious? _____

2. Explain why the cycads are endangered. _____
