

# 3 Diversity of plants

## CONTENT AND CONCEPTS

- Plants are classified as: plants with seeds (such as maize) or plants without seeds (such as ferns).
- Plants with seeds are Angiosperms (flowering plants) and Gymnosperms (cone-bearing plants such as the cycad).

- Plants can produce their seeds in flowers (Angiosperms) or in cones (Gymnosperms).
- Angiosperms consist of two major groups, dicotyledons and monocotyledons. These groups differ with respect to their roots, stems, leaves, flowers, fruit and seeds.

**Note:** *Emphasise local and other South African examples.*

## NOTE TO TEACHER

It is important to bring examples of real plant material for learners to look at. *See the examples mentioned.*

## TEACHER TASK

### Introduction

1. Explain that there are two groups of plants that produce seeds: Gymnosperm plants and Angiosperm plants. *See the information sheet on page 76.*
2. Explain to learners that many plants have special structures for reproduction to protect their seeds whilst they are being spread to other places (dispersed).
3. Bring some pine cones to the class.
4. Also bring fruit that contains seeds to class, such as beans, maize, apples with seeds, butternut, gem squash, pumpkin, tomato and avocados.

## Seed plants

### A. Gymnosperm plants

Gymnosperm plants produce seeds inside hard cones, for example, the pine tree and the cycad.



Female cones produce seeds



Male cones produce pollen

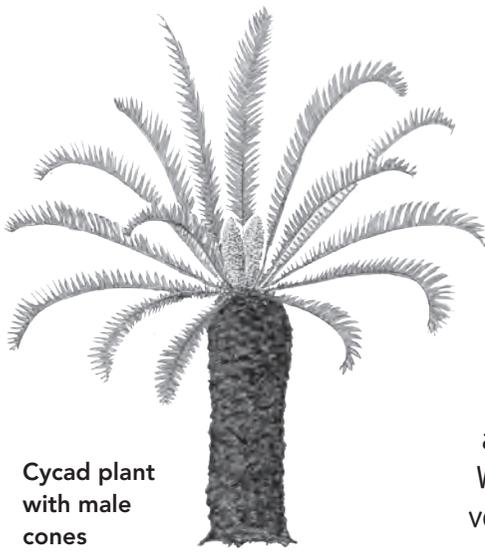


Pine tree

The **pine tree** is an example of a gymnosperm.

After pollination, the cones fall off the tree, and only release the seeds once the cone has dried out sufficiently.

Pine cones are too hard for most animals, so the seeds are protected until they are ready to be dispersed.



Cycad plant with male cones

## Cycads are gymnosperms

Some of our most famous South African cone plants are the cycads. Cycad species have existed on Earth since before the time of the dinosaurs. These plants have giant cones that are very hard and strong for protecting their seeds. A soft flesh covers the ripe seeds. Only certain animals can eat the flesh around the seeds. But the seeds themselves are very hard, and are very poisonous, which protects them from being eaten. We think this is why cycad species have survived on Earth for a very long time.

### B. Angiosperm plants

Angiosperm plants, for example, the tomato plant, produce seeds from a flower.

tomato



flowers from tomato plant



tomato seed inside fruit



Tomato plant with fruit

### Some common angiosperm plants that we use as food plants



Wheat



Avocado



Rice



Butternut squash



Eggplant



Pawpaw



Tomato plant



Runner beans



Maize plants with cobs

## Angiosperm plants

There are millions of different kinds of flowering plants found almost everywhere in the biosphere. Flowering plants are grown all over the world as crops to feed domestic animals and people.

Angiosperm seeds are often found inside a fruit or a hard pip. Animals often spread these seeds. They eat the soft fruit, and the hard seeds are then passed through the digestive system of the animals. In this way, the seeds are spread in the animal's droppings, and remain unharmed. People also collect the seeds for growing crops.

### **Activity:** Look at monocotyledon and dicotyledon plants

#### **TEACHER TASK**

##### **Explain**

1. Flowering plants are an important group of plants. This is because most of the food we eat comes from flowering plants. Most animal fodder for cows, sheep, and chickens also comes from flowering plants, such as maize. There are two main groups of flowering plants: monocotyledon plants and dicotyledon plants.
2. Almost all our carbohydrates and cereals such as rice and maize come from monocotyledon plants.
3. Most of our fruit and vegetables come from dicotyledon plants, including beans and peanuts, which provide protein.
4. Most large trees are also dicotyledon plants. We get wood, and pulp for paper from these trees.
5. We can recognise these two groups of flowering plants by the structure of their roots, stems, leaves, seeds and flowers.

##### **Preparation**

1. Take learners to a part of the school garden or any other suitable park or food garden, where a variety of plants are growing. If this is not possible, then use a vegetable such as a carrot with its leaves attached for a dicotyledon plant. You can use a spring onion or a leek to show the structures of a monocotyledon plant. Make sure there is one of each for every group in the class so learners can touch and feel the plant.
2. Buy a packet of dried butter beans at the supermarket. Count enough to provide one bean per learner. Soak the beans in water for a few hours for the learners to examine.



**LEARNER TASK**

**Activity:** Look at monocotyledon and dicotyledon plants

1. Go to the garden and look at the plants growing there.
2. Try to identify which are monocotyledon plants and which are dicotyledon plants.  
Use the pictures below as a guide.

