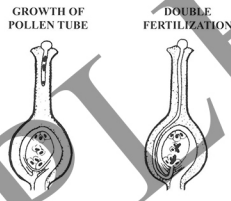


7 POLLEN GRAIN - w.m. Stained (480x) / POLLEN TUBE - w.m. Stained (480x)

When a pollen grain (N) lands on the pistil of a flower, it germinates, or grows. A delicate tube, growing in the direction of the arrows, penetrates down the style to an ovule in the ovary. Two stages of germination are shown. The pollen tube at the left is just beginning to grow. The one of the right is much longer, but only the very end of the tube is visible.

A pollen tube contains only three cells, but these make up the complete male plant. You can see the nuclei of these cells. The very pale tube nucleus (U) directs the growth of the pollen tube towards an ovule in the ovary. The two clearly visible sperm (R) are the male gametes that will actually participate in fertilization. The pollen tube (B) provides the passageway through which the male

gametes can reach the female gametes in the embryo sac of the ovule.



8 DOUBLE FERTILIZATION - x.s. Stained (420x)

The pollen tube eventually penetrates into the ovule by way of a tiny opening (micropyle). The tube nucleus disintegrates, but the two sperm enter the embryo sac.

One sperm unites with the egg cell at one end of the embryo sac (1). This union of two gametes develops into an embryo plant. The second sperm unites with two nuclei near the middle of the embryo sac (2). This union of three nuclei develops into a supply of stored food called the endosperm. The tissues (3) around the embryo sac harden into tough protective coats. Each fertilized ovule thus becomes a seed. What do you think the ovary turns into (refer back to Microslide 5)?

SUMMARY: *Can you answer these questions about reproduction in flowering plants?*

1. Where are the male gametes produced?
2. How do they reach the female gametes?
3. Where do the male and female gamete unite?
4. Why is this process called double fertilization?
5. What parts of the flower become the fruit and the seeds?
6. What three parts are present in every seed?
7. How many sets of chromosomes are there in each cell of the embryo? Of the endosperm?

THE FLOWER OF A FLOWERING PLANT

INTRODUCTION

Living thing must perform certain life functions in order to continue in existence. These functions can be separated into two categories: vegetative functions to keep the individual organism alive, and reproductive functions to keep the species in existence. An individual organism can live its entire life without reproducing. If reproduction fails in all the individuals in the species, the species dies out and become extinct.

Flowering plants carry on their vegetative functions

by means of their roots, stems and leaves. Can you list five such functions? Flowering plants carry on their reproductive functions by means of specialized structures called flowers. The Microslides in this set will enable you to study the organs of the flower and how they produce seeds and fruit necessary for reproduction.

The magnification given, for example, Microslide 1 - (12x), means that the microscope was set at that power when the photograph was taken.

1 COMPLETE FLOWER - x.s. Stained (12x)

A flower is really the tip of a stem bearing specialized reproductive parts called stamens and pistils. These essential reproductive organs are enclosed and protected by a floral envelope made up of modified leaves called sepals and petals. In this cross section of a buttercup, you can see all of these parts. The outer perimeter is made up of sepals, while the innermost structures are pistils.

Note that a complete flower like the buttercup has four kinds of specialized parts: sepal (L), petal (T), stamen (S), and pistil (P). How many sepals and petals can you identify in the cross section?

Not all types of flowers are complete, however. Some species lack one or more of the floral parts. Some may lack sepals, others may lack petals, and still others may lack both. In some species, flowers may lack one or the other of the reproductive parts. Thus, a corn plant bears two different kinds of flowers. The stamens are in the tassels, and the pistils are in the ears. The reproductive parts of the pussy willow flower are also separated. In the willow, flowers bearing pistils occur in completely different plants from flowers bearing stamens.