

Biology Revision Presentation

Gamete Production in plants

The male gamete
of the plant is
within the
pollen grain.

The pollen grain is
formed in the anther
where meiosis takes
place to form
haploid pollen grains.

The pollen grain itself consists of a *tough outer wall*¹, a *generative nucleus* and a *pollen tube nucleus*.

¹ which makes it resistant to desiccation.

When the pollen grains are mature
the *anther dries out*.

Shortly after this *dehiscence occurs* - the
pollen sacs curl away from the pollen
grains releasing them.

These are then carried away either by
the *wind or by insects* or through one of
the other pollination mechanisms.

The female gamete
is the *egg nucleus*
and is situated
within the
ovule.

To form the ovule a *mother cell* undergoes meiosis.

This produces a *haploid embryo sac* with *8 nuclei* formed in mitosis.

The ovule itself is *contained within the ovary.*

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Fertilisation

Fertilisation is the
process by which
the male and
female gametes
fuse.

Fertilisation

produces a zygote.

When a compatible
pollen grain lands
on the stigma it
takes in water and
sucrose before
germinating.

...The germinating pollen grain produces a pollen tube...

...The pollen grows down the style - a chemotropic response...

...As the pollen tube grows it secretes enzymes to digest its path...

...The pollen tube nucleus guides the pollen tube followed by the two male nuclei...

Once it has passed through the style and ovary wall it passes through a hole in the integuments called the micropyle into the embryo sac.

With its job complete
the pollen tube nucleus
disintegrates and the
male gamete is released
into the embryo sac.

A double fertilisation
then takes place.

This is unique to
flowering plants –
angiosperms.

In the double fertilisation
one male gamete fuses
with both polar nuclei to
form a triploid
endosperm nucleus.

The other fuses with the
female gamete to form
the zygote.

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DEVELOPMENT OF THE PLANT

The diploid zygote
from fertilisation
divides by **MITOSIS** to
form the **EMBRYO**.

The embryo consists
of the **PLUMULE** (embryonic shoot)
and **RADICLE** (embryonic root).

Depending on the
plant the embryo also
contains one (mono-) or
two (di-) **COTYLEDONS, 'SEED
LEAVES'**.

The ***TRIPLOID ENDOSPERM***
NUCLEUS becomes a
FOOD STORE for the
developing embryo.

The remaining transformations are given by the following mnemonic:

Overdue
failed
zoological
efforts
increase
trust
of
Spiderman.

Overdue failed

Ovary \Rightarrow Fruit

zoological efforts

Zygote => Embryo
plant

increase trust

Integuments \Rightarrow testa

of Spiderman

Ovule => Seed

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