

Reproduction

1. Asexual Reproduction
2. Sexual Reproduction

Asexual Reproduction

This does not involve the fusion of gametes (egg and sperm)

Offspring are genetically identical to the single parent.

Mitosis – is the process of cell division where one parent cell forms two daughter cells.

Review Mitosis

- Other ppt

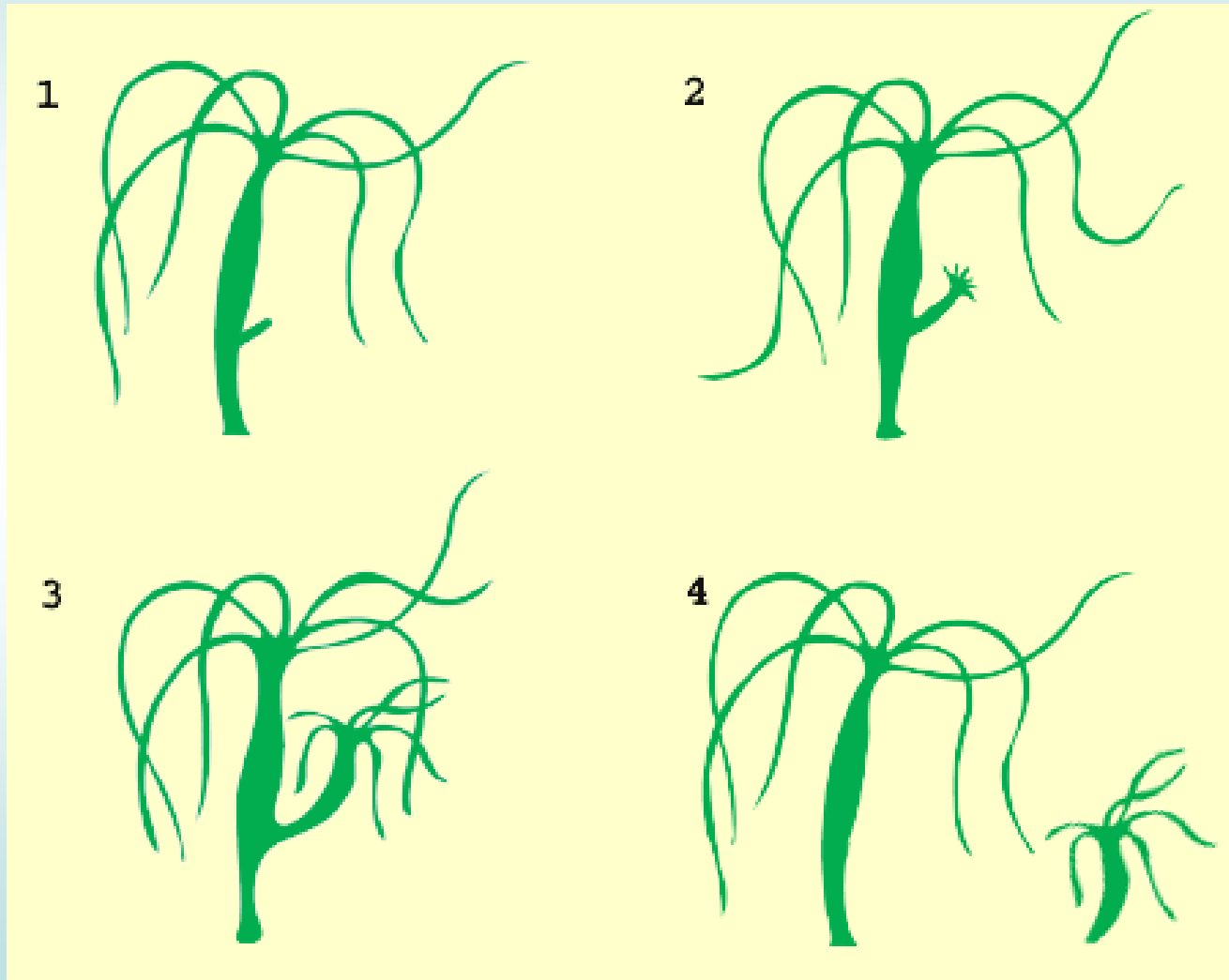
Asexual reproduction

- One parent
- Produces genetically identical offspring – **clones**
- Suited to organisms living in relatively stable environments
- Has several ways of reproducing.
Examples.....

1) Fission and budding

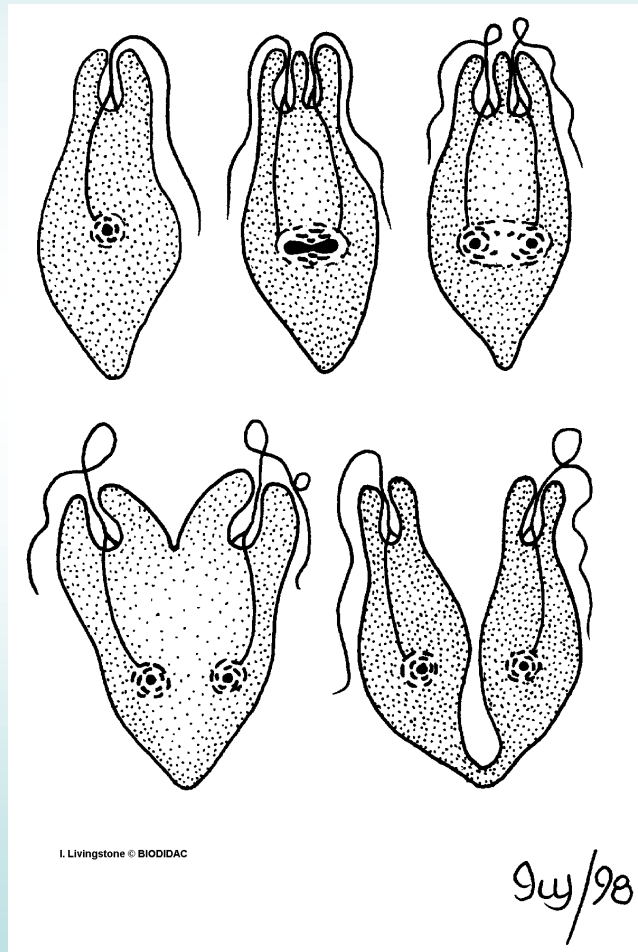
- Bacteria and protozoans
- Mitotic division
- Divides in two
- **Budding** is similar to fission but dividing of the cytoplasm is unequal

Budding in *Hydra*





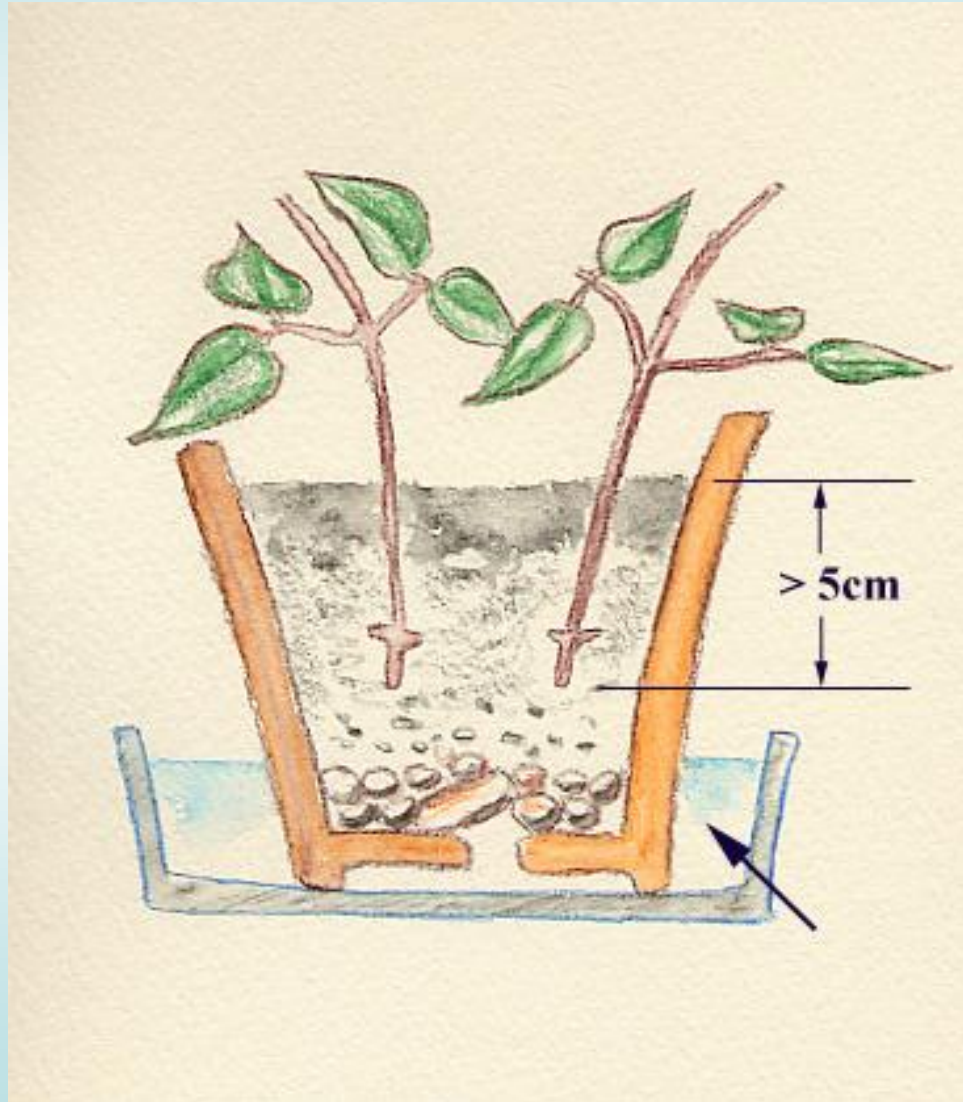
Binary Fission in a Protist



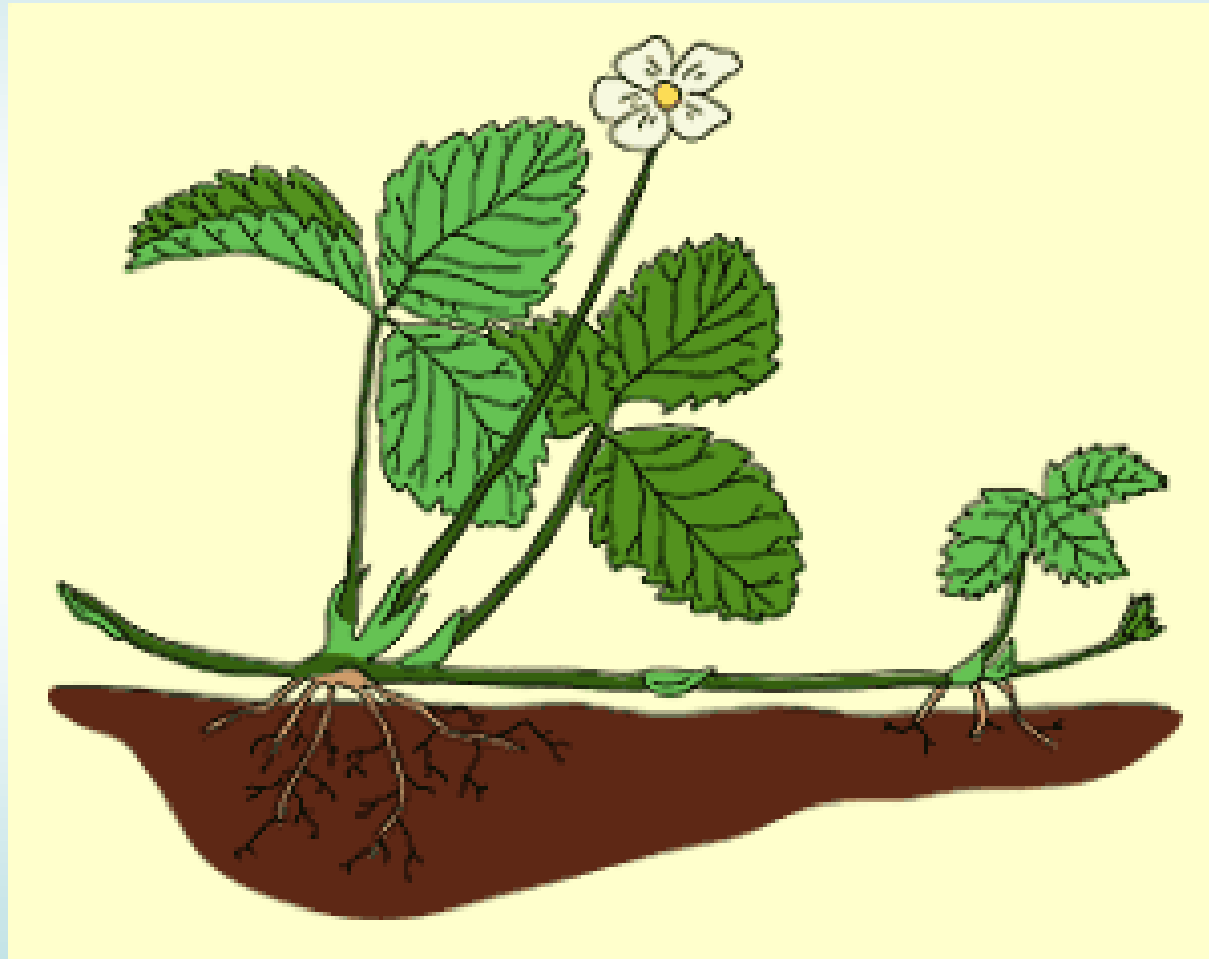
Vegetative reproduction

- Separation of part of one plant to form new independent plant
- **Rhizomes** – underground stems which give rise to new shoots and roots
e.g. Bracken, couch grass, irises
- Also tubers (potatoes), plantlets (spider plant), lateral buds (daffodil)

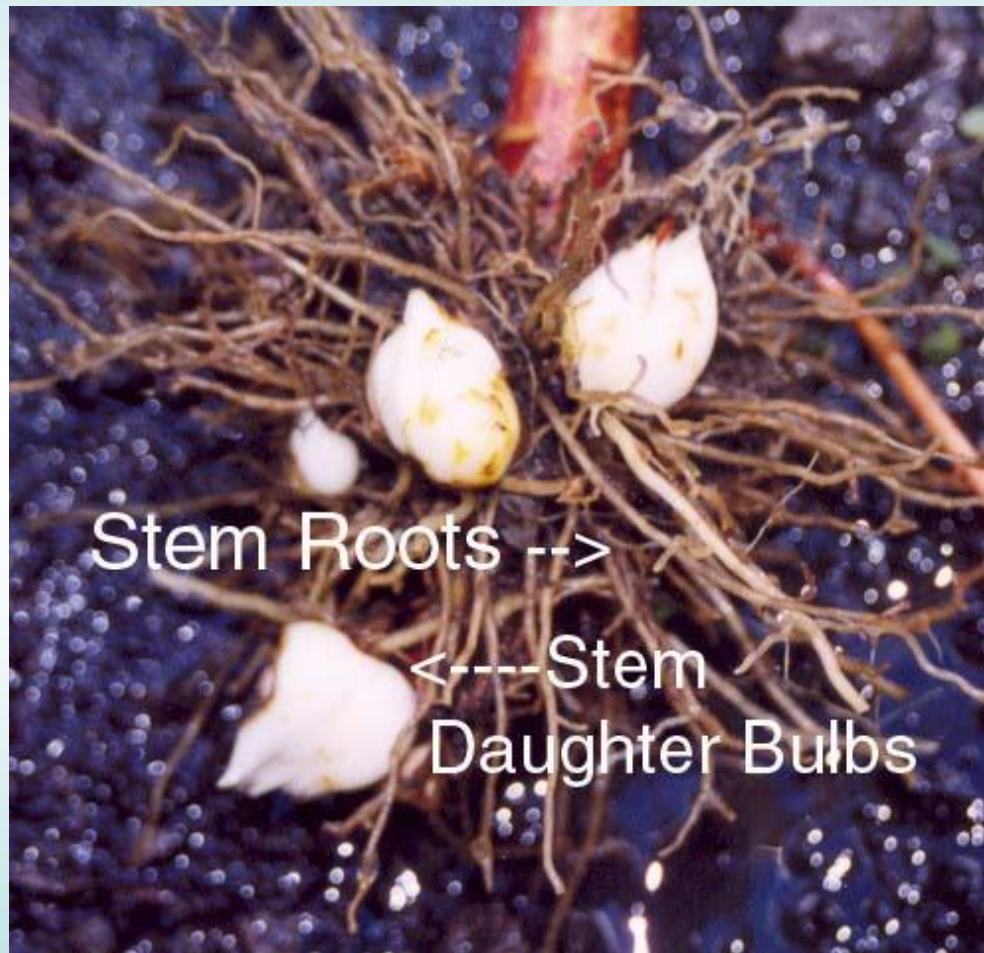
Plant Cuttings



Runners in Strawberries

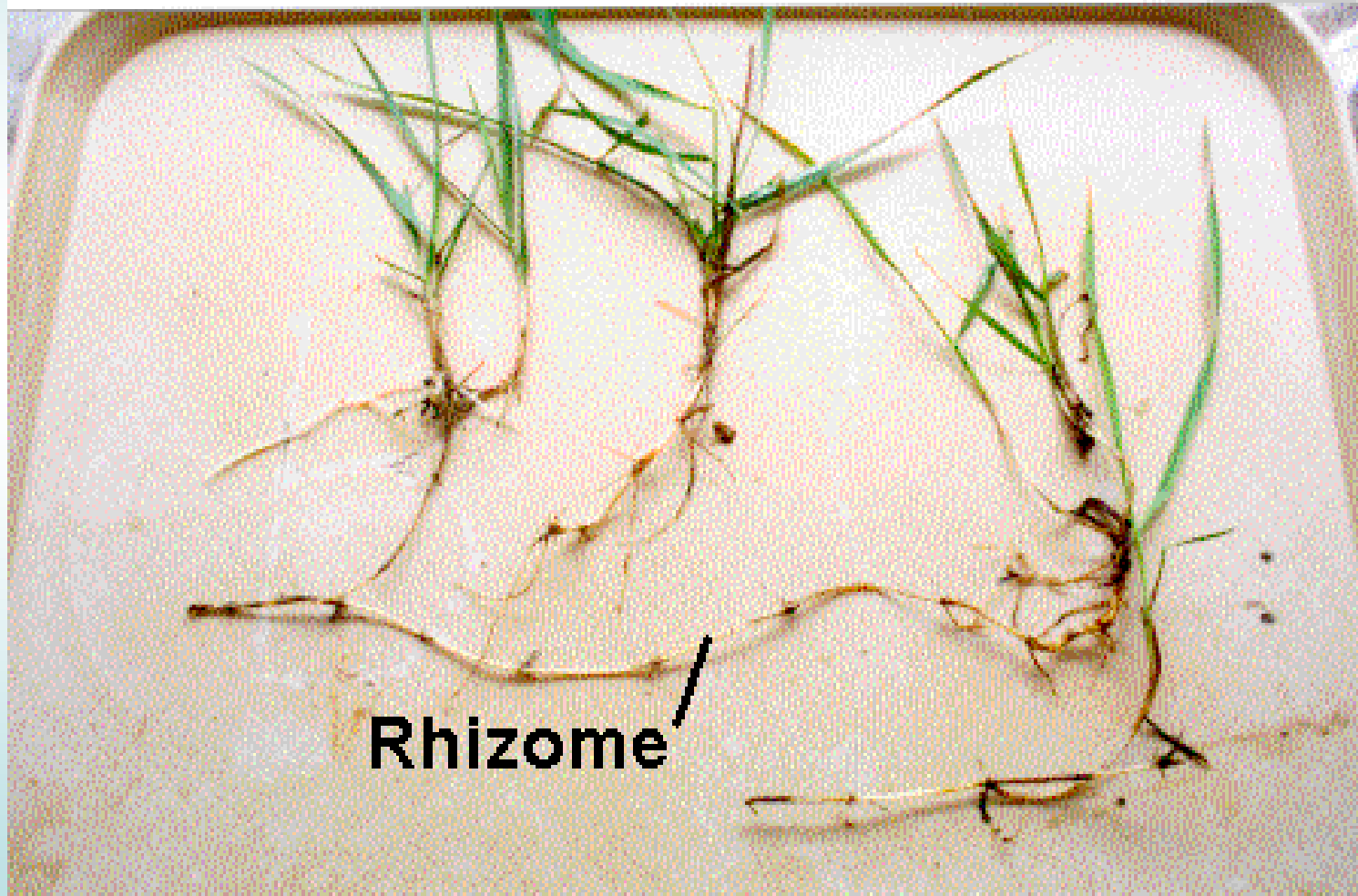


Bulbs





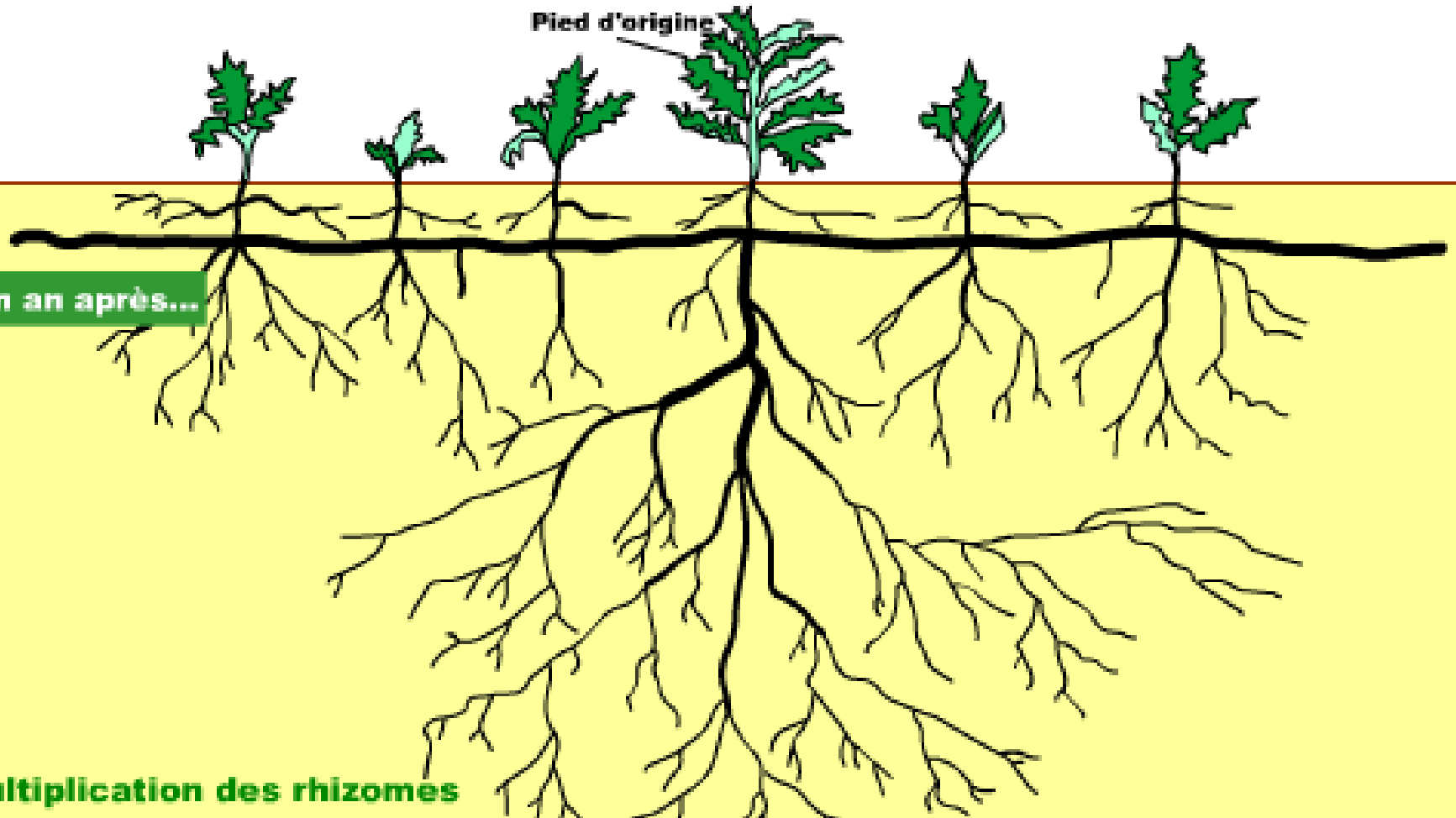
Rhizomes (horizontal underground stems)



Pied d'origine

Un an après...

Multiplication des rhizomes



Spore formation

- Produced by budding
- When it lands in a suitable environment it germinates
- Spores are asexual reproductive cells produced by mosses, ferns and fungi and other organisms.



Parthenogenesis

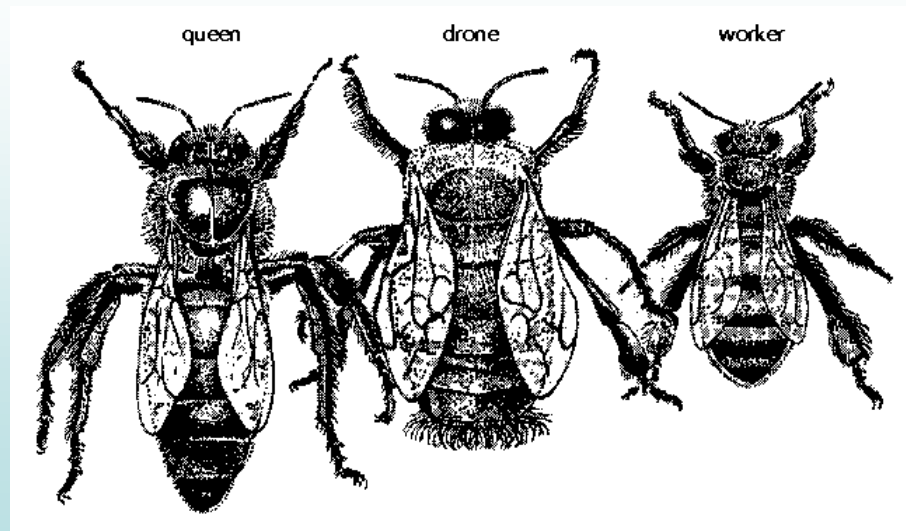
- In parthenogenesis, an individual is formed from an unfertilized ovum that did not complete meiosis.
- Development of an egg in the absence of fertilisation
- e.g. Male bees, wasps and ants, lizards and birds



Parthenogenesis in Honey Bees

There are three main categories for honey bees.

1. The queen lays eggs. She mates once and retains the sperm for the rest of her life.
2. Fertilized eggs become sterile female workers.
3. Unfertilized eggs develop into male drones via parthenogenesis.



Sexual Reproduction

1. is characterised by the fusion of egg and sperm.
2. produces variety in the offspring.
3. involves two parents.
4. involves a greater expenditure of energy when compared to asexual reproduction.

Meiosis

A specialized cell division in which a single cell undergoes two nuclear divisions following a single round of DNA replication.

Four daughter cells are produced that contain half the number of chromosomes as the parent cell.

Meiosis is necessary for the formation of gametes (egg and sperm).

MEIOSIS

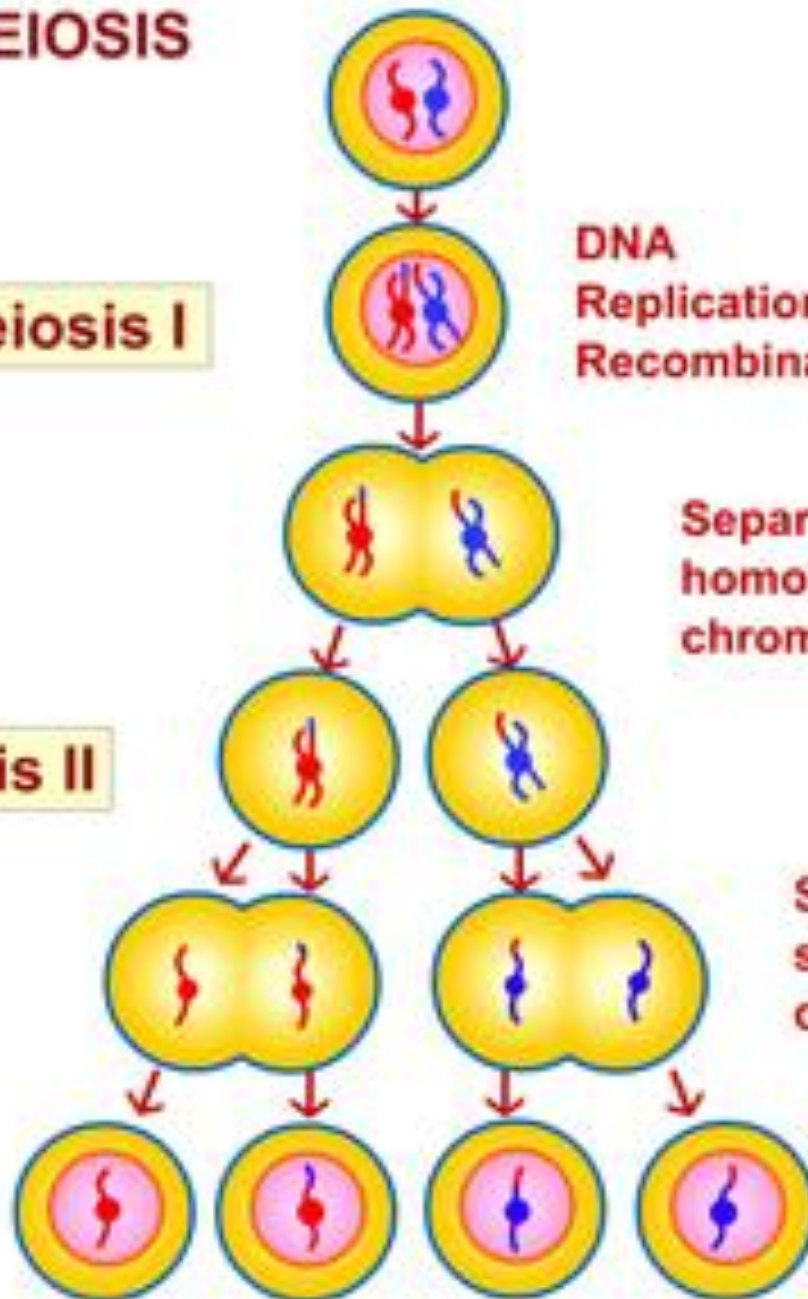
Meiosis I

DNA
Replication and
Recombination

Separation of
homologous
chromosomes

Meiosis II

Separation of
sister
chromatids



Mitosis

Parent cell



DNA replicates



2 daughter cells



Meiosis

Parent cell



DNA replicates



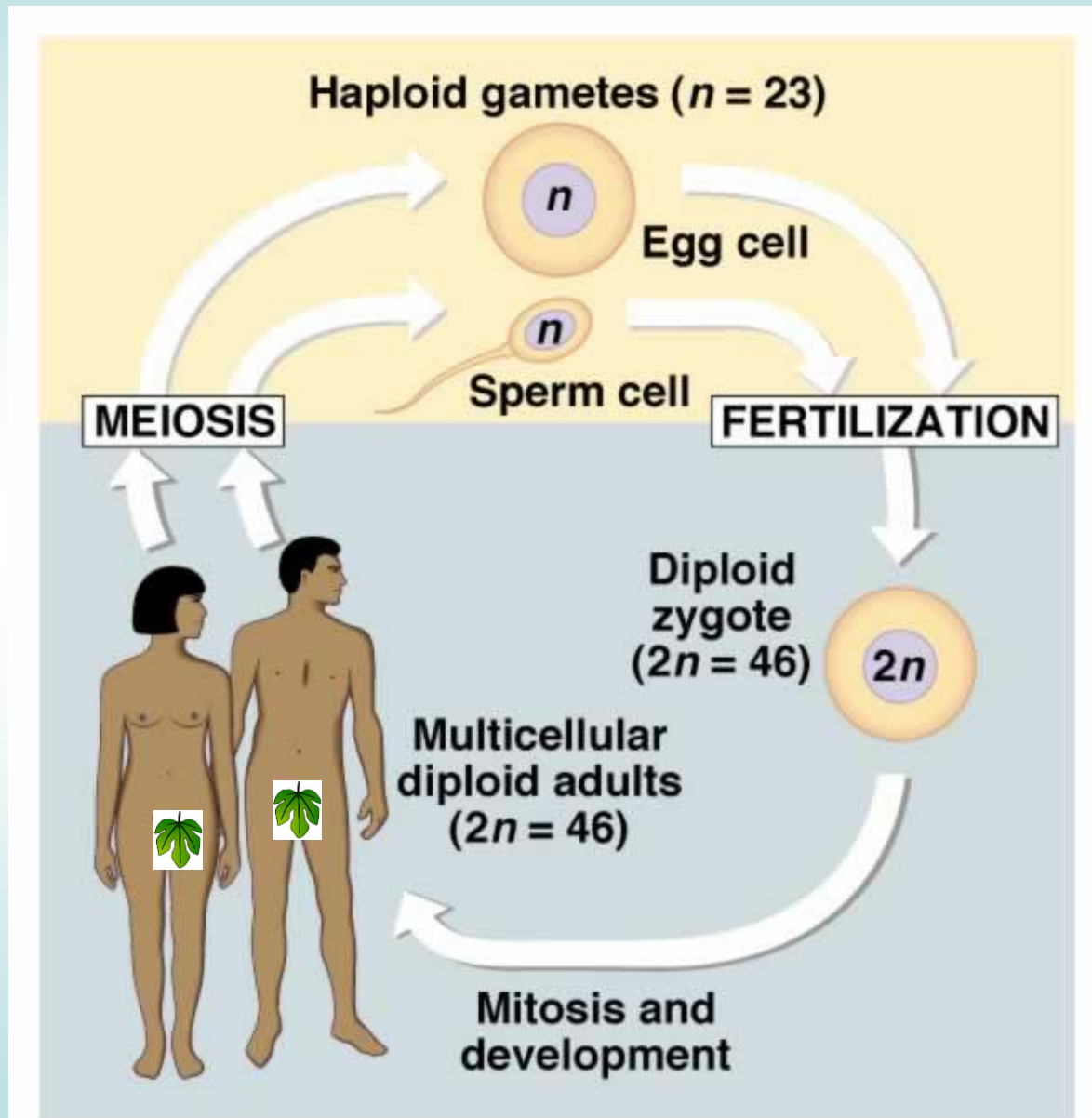
2 daughter cells



4 daughter cells



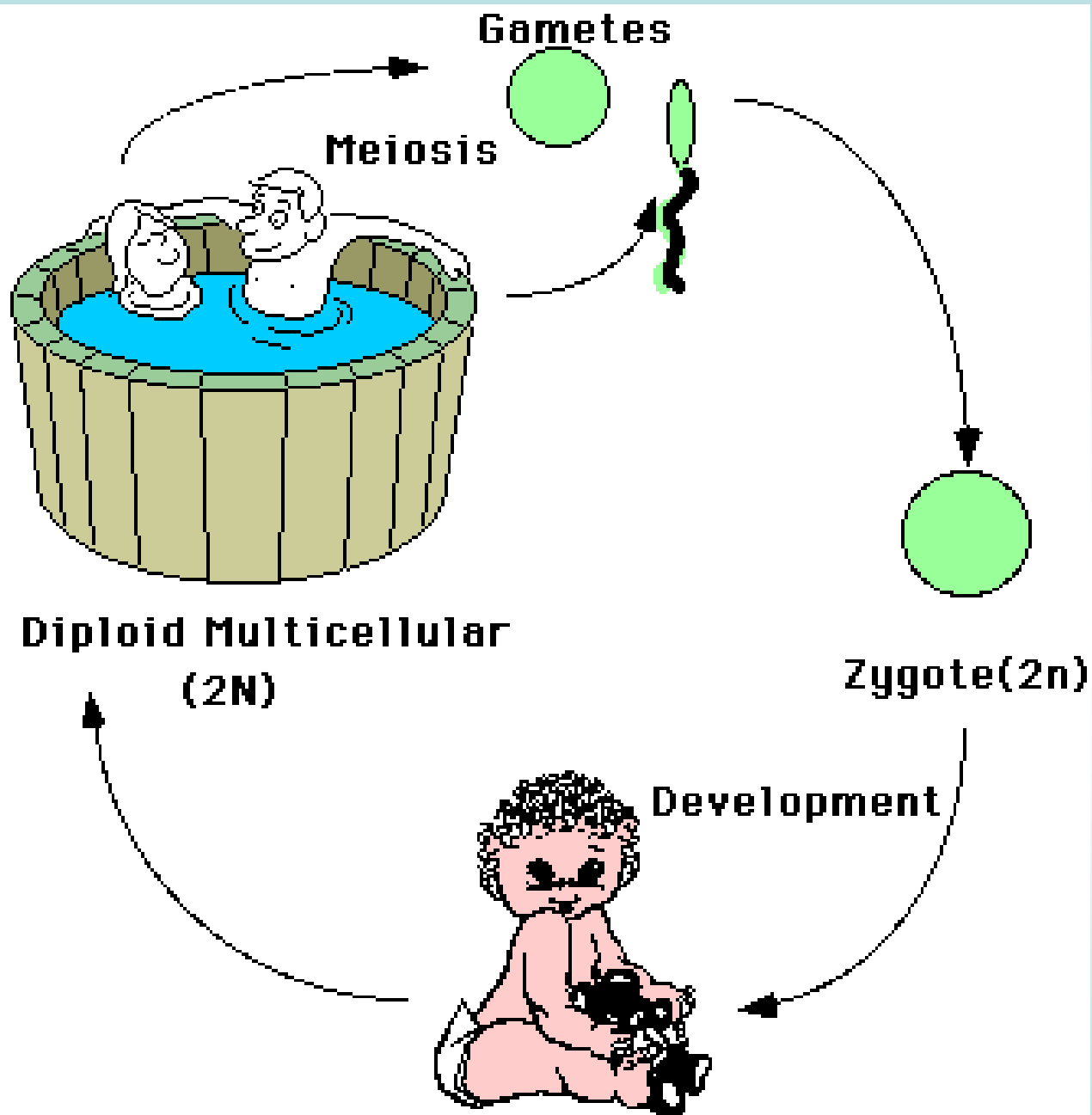
Sexual Reproduction in Mammals



Sexual reproduction

- **Germ cells** give rise to **gametes**
- Sexual reproduction involves fusion of gametes to form a **zygote**
- Gives **variation**
- Process of cell division that makes egg and sperm is **meiosis**

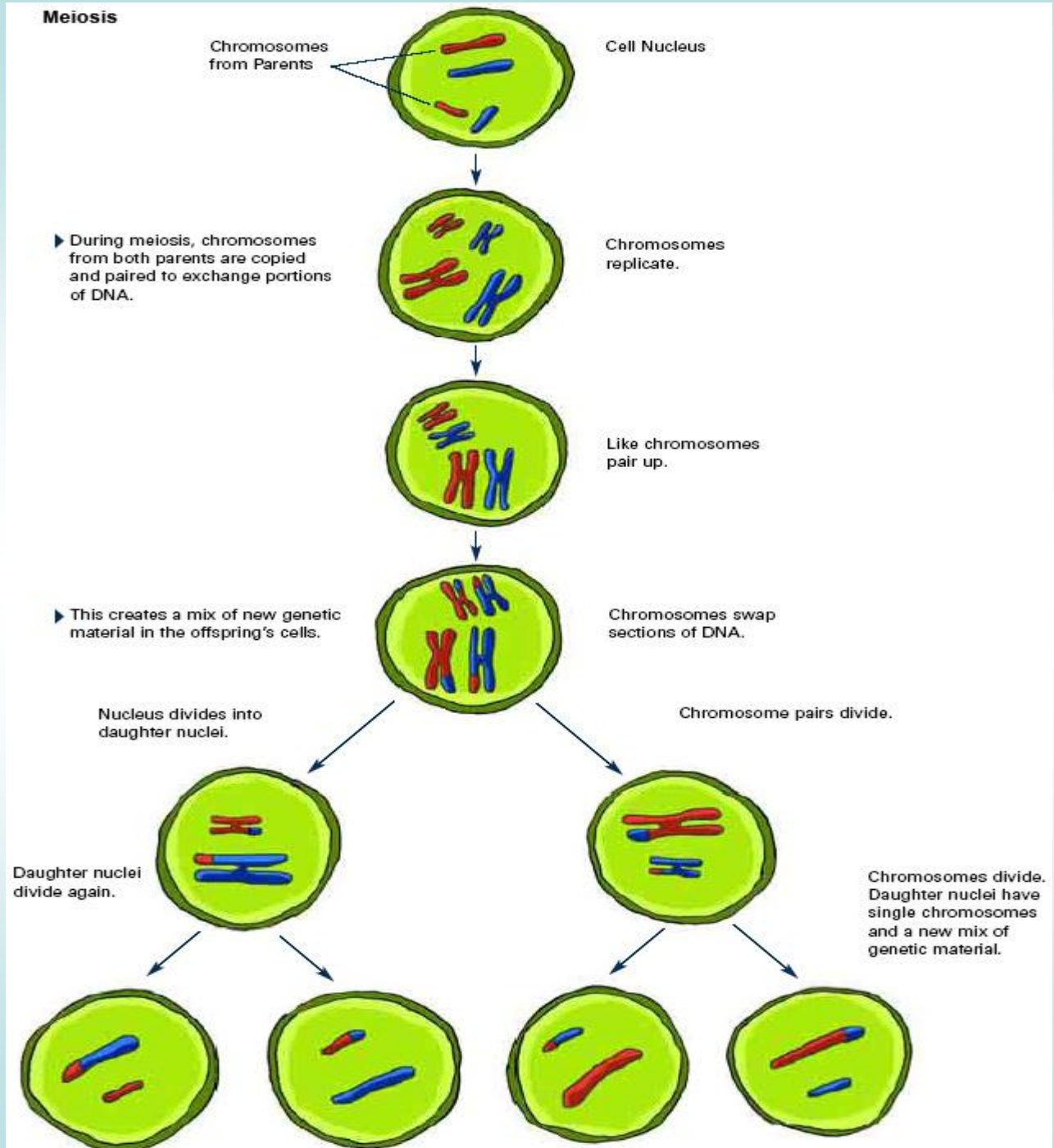
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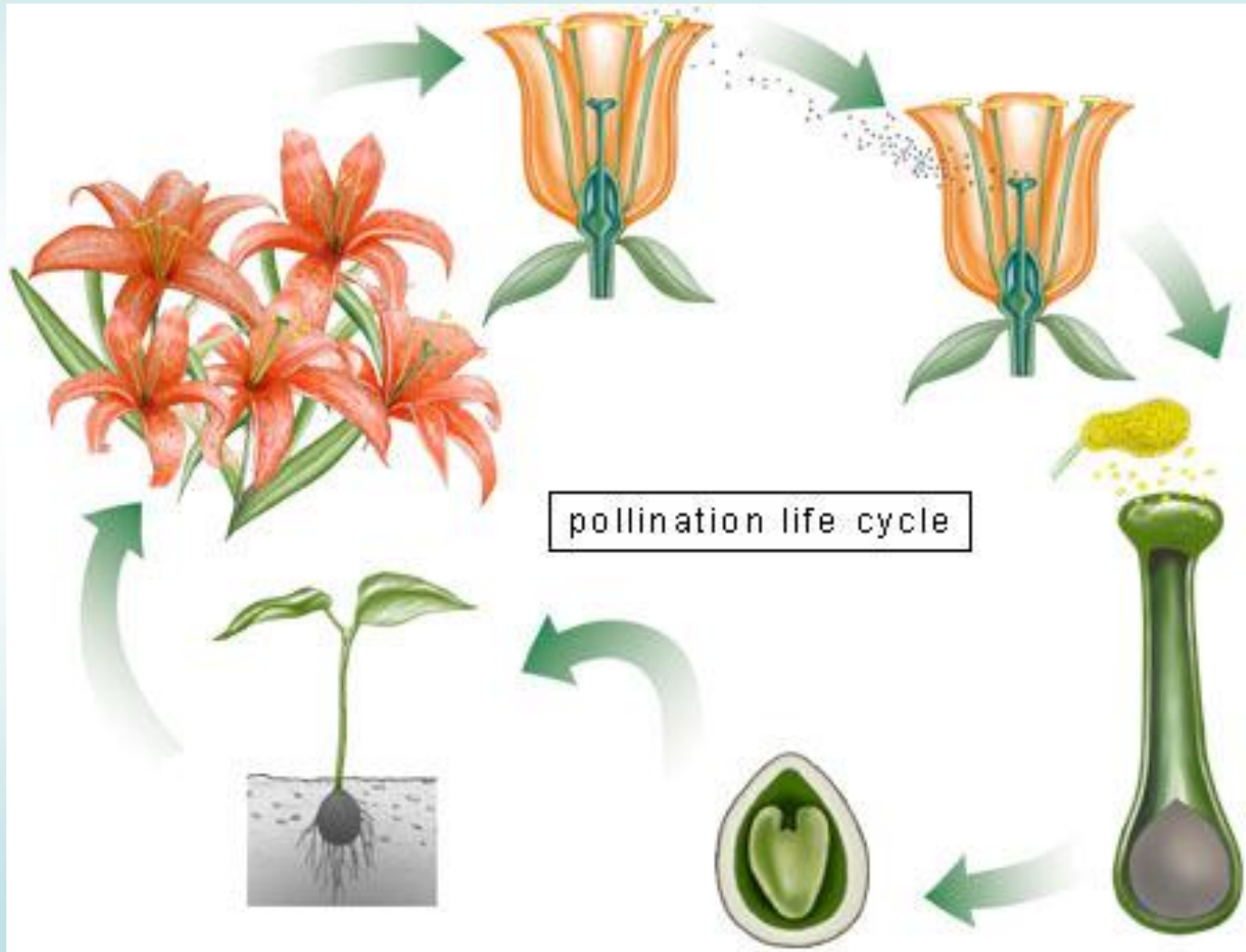
Meiosis

- **Reduction division** – reduces the number of chromosomes in gametes by half (**haploid**)
- Equal genetic contribution from male and female parents
- Gametes are genetically unique because:
 - 1) Recombination (crossing over)**
 - Genetic information exchanged between members of each pair when they pair up
 - 2) Random assortment**
 - Gametes receive random selection of chromosomes from parent

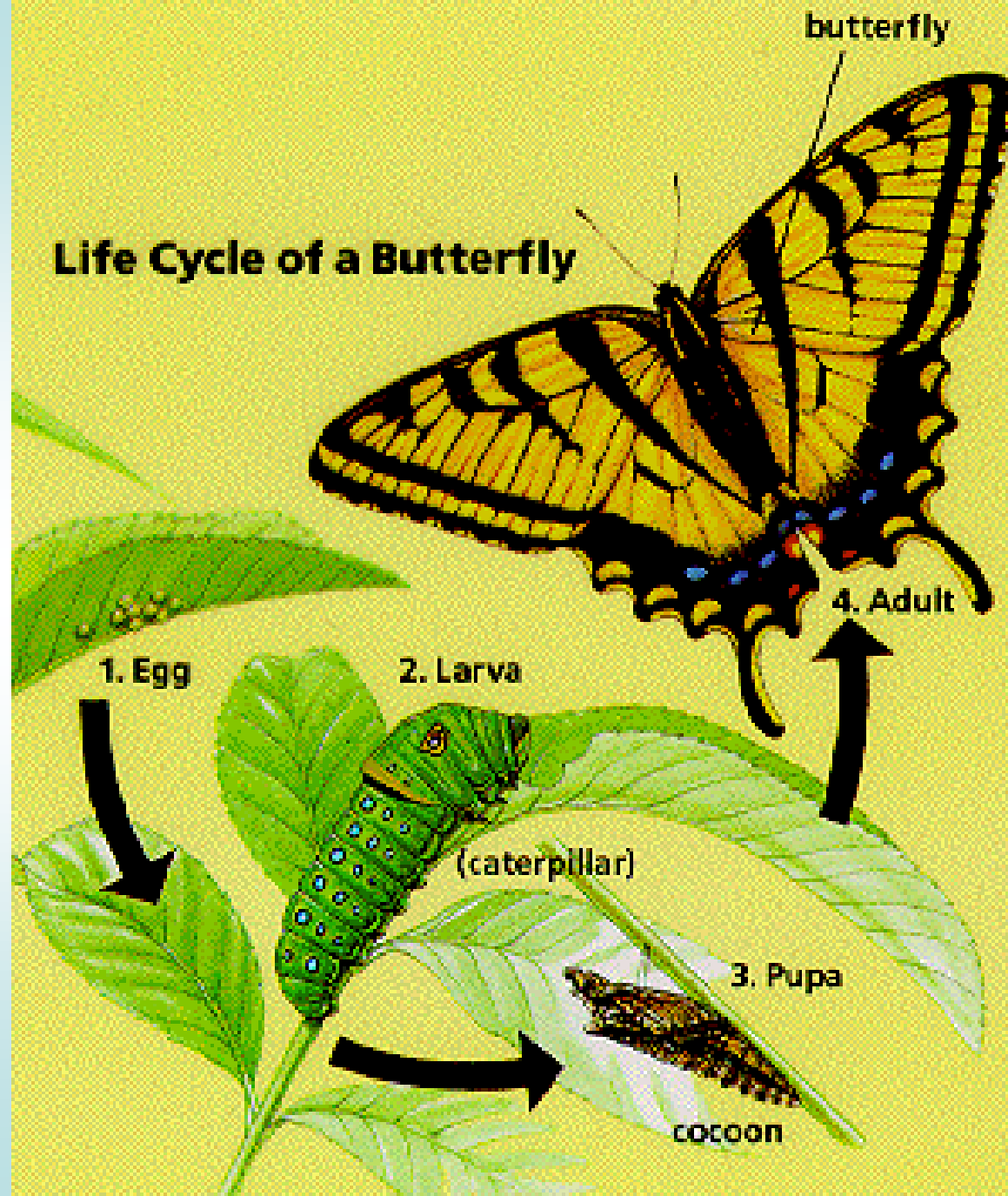
Meiosis

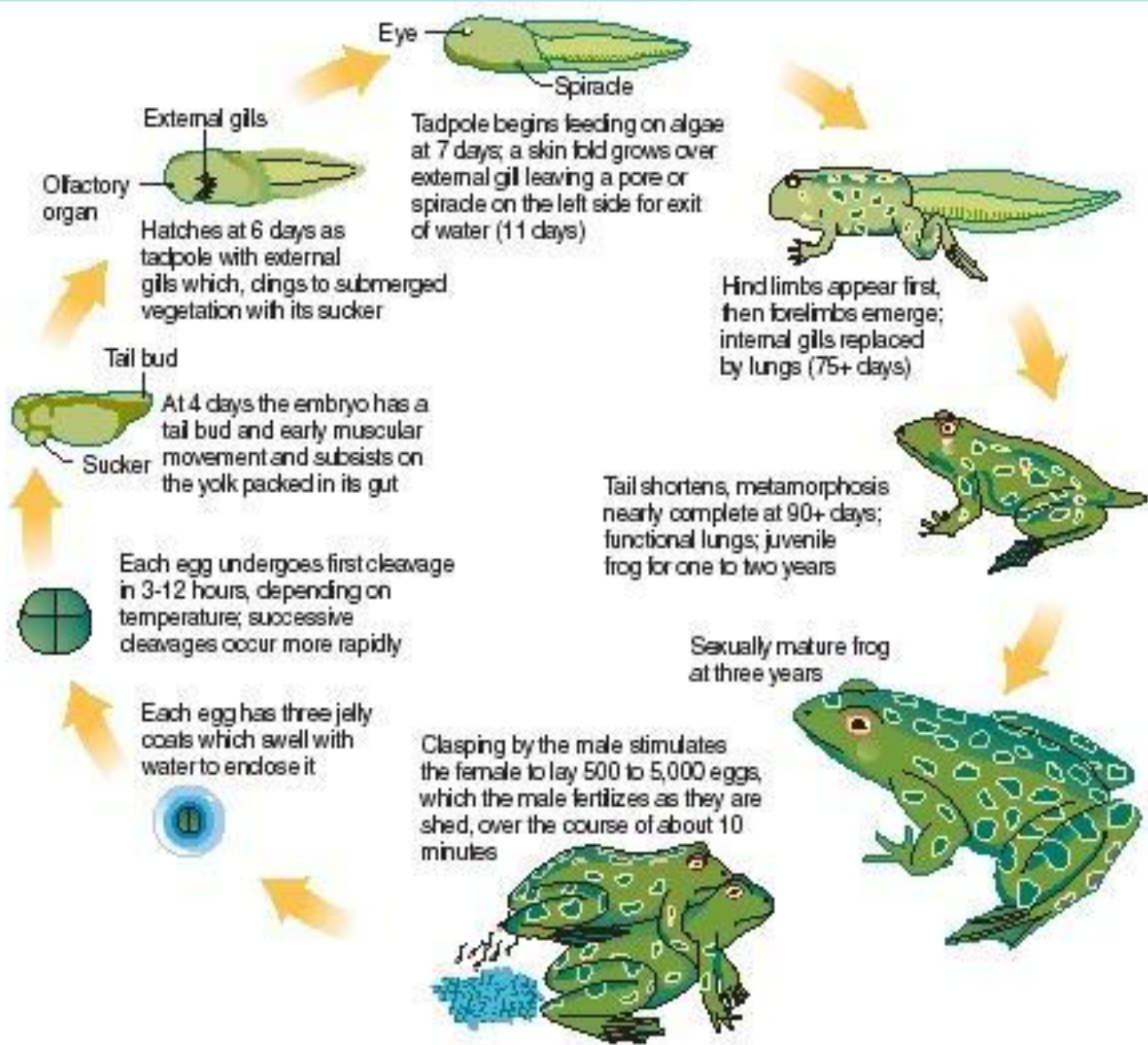


Sexual Reproduction in Flowering Plants



Life Cycle of a Butterfly





LIFE CYCLE OF A FROG

