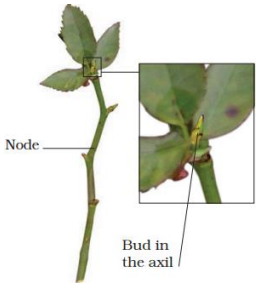
Chapter – 8: Reproduction in Plants

- To reproduce – characteristics of all living things
- Reproduction – process of creating young ones – same species

Modes of Reproduction

- Most plants – roots, stems, leaves – vegetative parts
- Sometime later – plants bear flowers – give rise to fruits
- We eat fruits – throw away seeds – seeds germinate – grow into plants
- Flowers – reproductive parts
- 2 modes of reproduction –
    - Asexual – new plants produced – without seeds
    - Sexual – new plants obtained from seeds

Asexual Reproduction



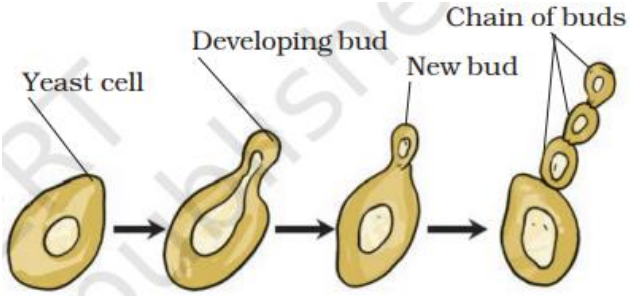
Vegetative Propagation

- New plants produced from – roots, stems, leaves, buds – vegetative parts
    - Cut a branch of rose with a node – cutting – burry it in soil
    - Node – part of branch – leaf grows from
    - Water this cutting everyday – observe the growth – sometime later – roots and leaves grow
- Flower buds – grow into flowers
- Other buds – axil (point of attachment of leaf) of leaves – develop into shoots
- These buds – vegetative buds
- Bud – consist of short stem – immature (underdeveloped) leaves covers them
    - Take a fresh potato – observe the scars – buds – eyes of potato
    - Cut the potato – each piece with a bud – burry them in soil
    - Water them regularly – observe their progress

- *Bryophyllum* – buds in leaves – leaf falls on moist soil – each bud – produces new plant
- Roots – some plants – produce new plants – Sweet potato, dahlia
- Some plants – cacti – produce new plants – detached parts – each part – grow into new plant
- These plants – less time to grow – produce fruits and flowers earlier
- New plants – exact copies of parent plants – cause – single parent

Budding

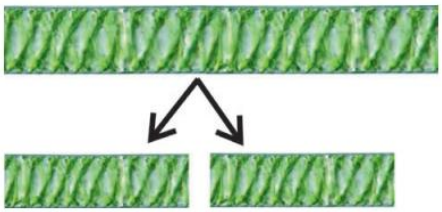
- Small organisms – yeast – visible under microscope
- Sufficient nutrition – grow and multiply rapidly



- Yeast – single-celled organism
    - Take some yeast cake or powder from bakery or chemist shop
    - Take it in container – add some water – add some sugar – stir it - place it in warm place
    - Observe after some time – under microscope – reproduction of yeast cell can be seen
- Small bulb-like projections – bud – grows slowly – disconnects from the parent cell – forms a new yeast cell – this new cell – grows and forms more new cells
- Sometimes – chain of buds – formed – produces lots of yeast cells – short period of time

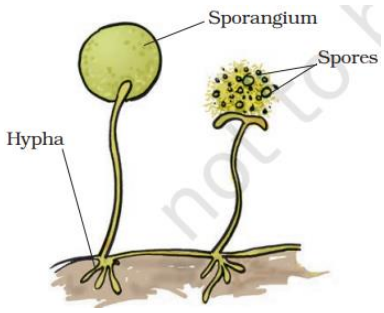
Fragmentation

- Slimy green parts – ponds, water bodies – algae
- Sufficient water and nutrition – algae grows and multiplies rapidly – fragmentation
- 1 alga (spirogyra) – breaks into 2 pieces – both grows into new algae
- This process – reproduce quickly



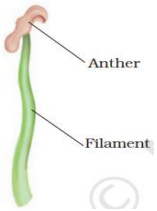
Spore formation

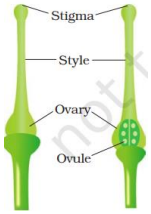
- Fungi – grows from spores – on a bread
- Spores – released into air – keeps floating – covers long distances
- Spores – asexual reproductive parts
- Each spore – covered with hard coating – protect from unfavourable conditions – high temperature, low humidity – survive for longer
- Favourable conditions – spore germinates – grows into a new organism
- Ferns, moss – also use this method



Sexual Reproduction

- Flowers – reproductive part of plants
- Stamens – male part – pistil – female part
    - Take a mustard / china rose / petunia flower – cut it open
    - Study all its parts – especially stamen and pistil

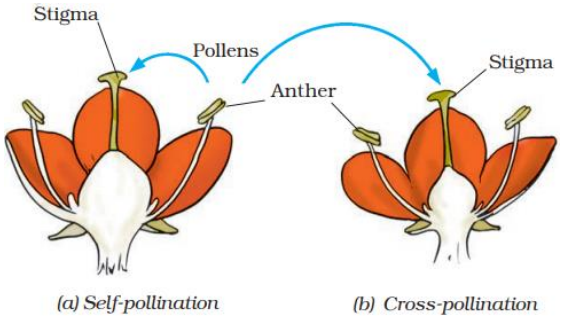




- Flowers – only stamen or pistil – unisexual flowers – corn, papaya, cucumber
- Flowers – both stamen and pistil – bisexual flowers – mustard, rose, petunia
- Both male and female unisexual flowers – may be present in the same plant or in different plants
- Anther – contain pollen grains – produce male gametes
- Pistil – consist of stigma, style, ovary
- Ovary – contain one or more ovule – produce female gamete (egg)
- Male and female gamete – combine (fuse) – form zygote

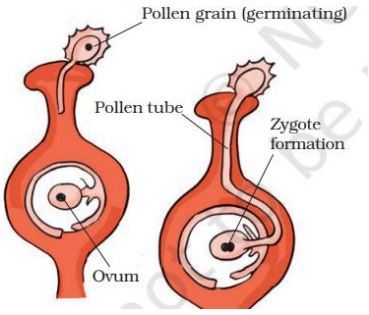
Pollination

- Pollen grains – tough protective coat – prevents them from drying up
- These grains – light weight – carried by wind or water – insects carry pollen as well
- Some pollens – land on stigma of flower – same kind
- Transfer of pollen – anther to stigma – pollination
- Pollen – land on same flower or same plant – self pollination
- Pollen – lands on flower of different plant – cross pollination



Fertilization

- Fusion of gametes – produce a cell – zygote
- Process of fusion – male and female gametes – fertilization
- Zygote – develops into embryo



Fruits and Seed Formation

- After fertilization – ovary grows into fruit – other parts fall off
- Fruit – ripened ovary – ovules develop into seeds
- Seeds – contain embryo – enclosed in seed coat
- Some fruits – fleshy and juicy – mango, orange – other fruits – hard – walnuts, almonds

Seed Dispersal

- Nature – same plant – grows at different places

- Reason – seeds dispersed to different places
- Walk through a forest, park, etc – seeds or fruits stick to your clothes
- All seeds – fall at same place – huge competition – sunlight, water, minerals, space
- Plants benefit – seed dispersal – prevents the competition
- Plants – captures new habitats – wider distribution
- Seeds, fruits – carried by wind, water, animals
- Wind carries –
    - Drumstick, maple – winged seeds
    - Grasses – lightweight seeds
    - Aak (*Madar*), sunflower – hairy seeds, fruits
- Water disperses some seeds –
    - These fruits or seeds – develop floating abilities – coconut
- Animals – also disperse some seeds –
    - Spiny seeds – contain hooks – attached to animals' furs – Xanthium, Arena
- Castor, balsam – seeds dispersed – fruits burst suddenly