

## 41 - Vegetative Reproduction

Vegetative reproduction - is a form of **asexual** reproduction in plants. This does not involve gametes and only one plant is involved. The offspring are **clones** (identical to each other and the parent).

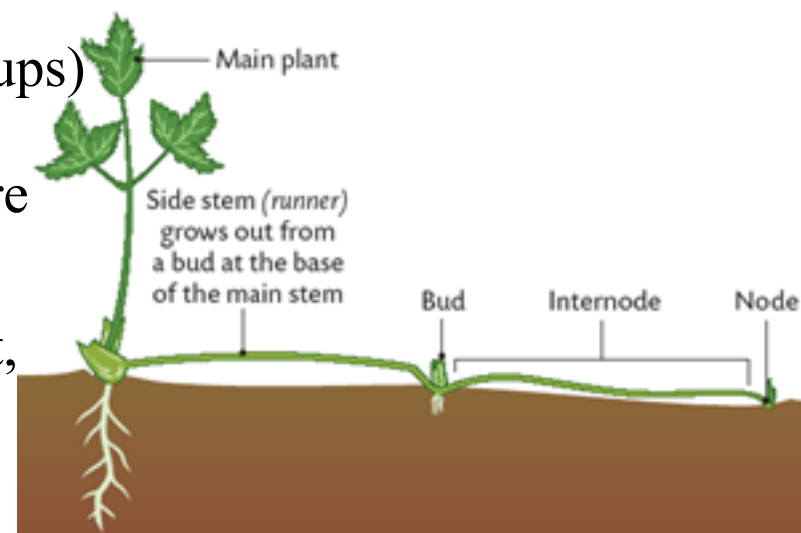
### Natural Methods

Vegetative propagation involves forming new plants from, a stem, roots, leaf or a bud.

### Stem

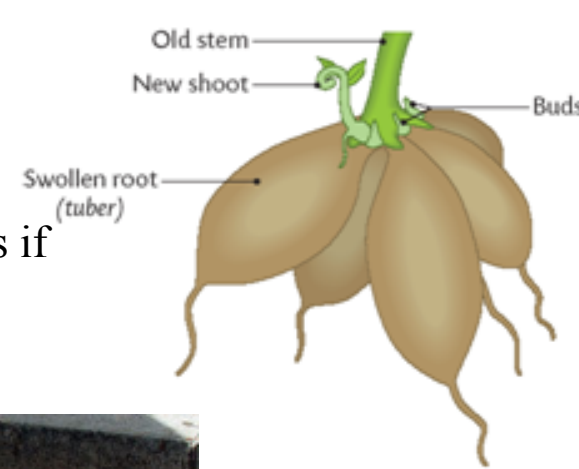
Runners (e.g. strawberries and buttercups) these are stems that run above ground. They have long internodes and buds are formed at each node.

Each bud may give rise to a new plant, complete with its' own root system.



## Root

A root tuber (e.g. **dahlia**) is a swollen, fibrous root that remains dormant. New shoots grow out from the base of the old stem, which withers away each autumn.



## Leaf

The leaves of some plants grow rapidly into new plants if detached from the plant.

A good example is **cactus**.



## Bulbs

A bulb (e.g. onion, **daffodil**, tulip) contains an underground stem.

Numerous leaves are attached to this stem and each leaf is swollen with food.

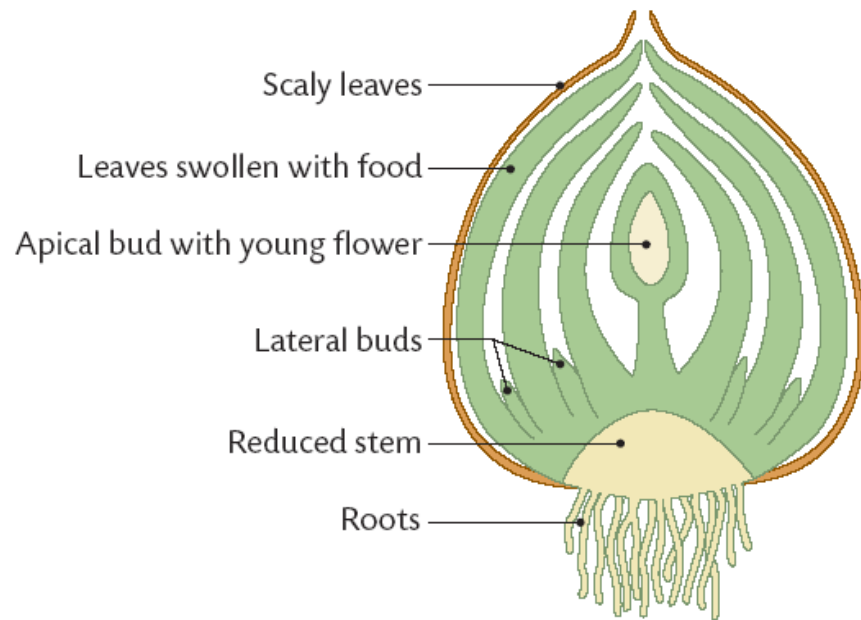
The centre of the bulb has an apical bud which can produce leaves and a young flower.

After 6 weeks of photosynthesis the food made is sent back down to the bud to allow the plant to survive till the next year. The old bulb now has one or more new bulbs inside it.

Bulbs will spread by this method of making new bulbs each year.



## Typical Onion Bulb



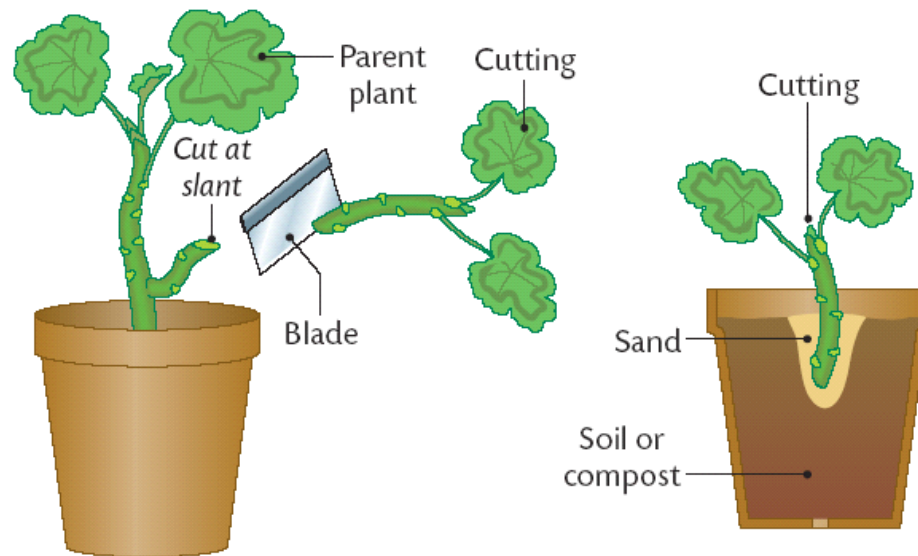
## Artificial Methods of Propagation

These are methods used by plant growers (horticulturists) and in Agriculture.

### Cuttings

These can be taken from plants (willow, **Busy Lizzie**).

A piece is cut from the parent plant at an angle and the end is cover with **rooting powder** (growth promoter) to speed up the growth of new roots.



## Grafting

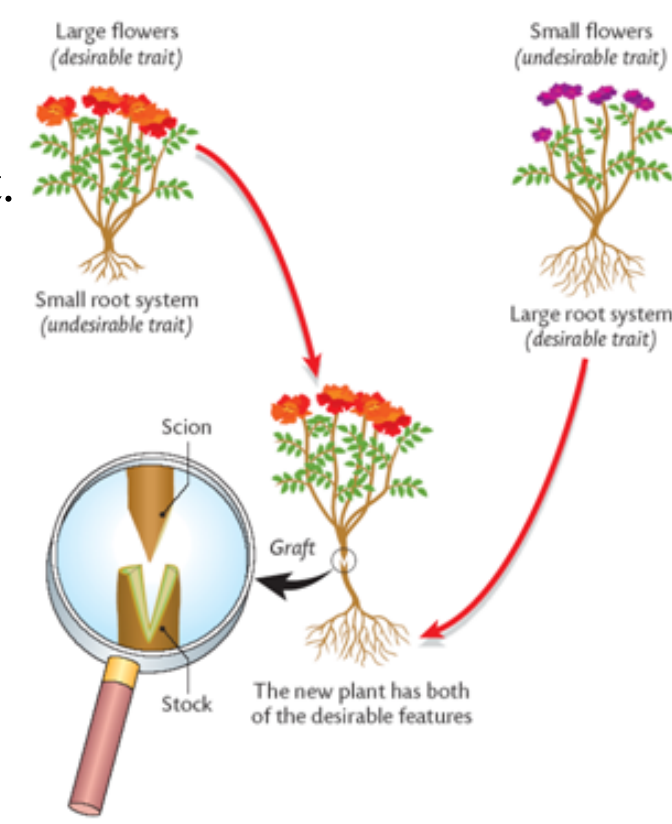
This is used to combine **useful qualities** from **two** different plants into one plant.

Plants such as roses and **apple** trees are often grafted.

Part of one plant is cut (**scion**) and attached to a growing plant (**stock**).

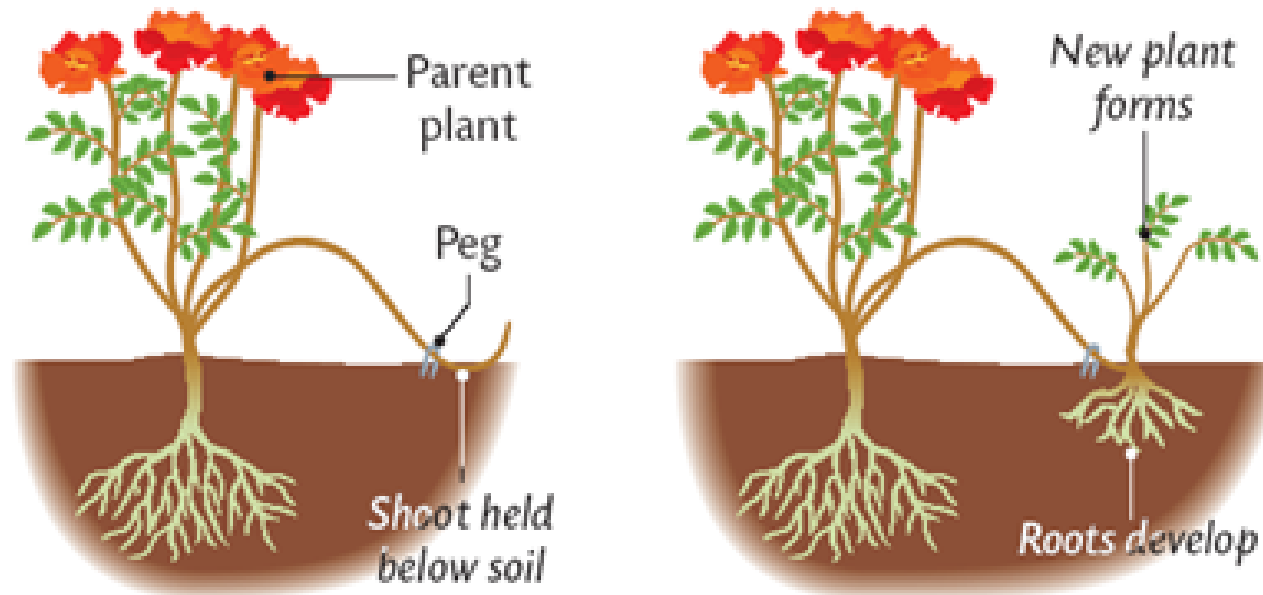
The contact between the two plants has to be good to be successful.

For example, a rose with **large flowers** can be grafted to a rose with a **large root system** to make a better plant.



## Layering

This is where the branch of a plant is **pegged** down under the soil except at the tip. The covered part forms roots and the tip grows up as a new stem. In time the two plants are then separated.



# Micropropagation

This is also called **tissue culturing**.

Lots of plants are grown from very small pieces of plants.

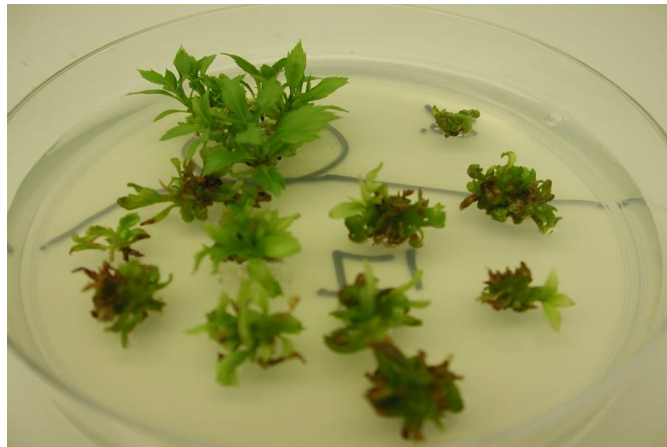
Quite often they are grown from only a **few cells**.

The cells are grown on a **growth medium** that supplies food for the cells to divide.

Nutrients and **growth regulators** are added to form a group of similar cells called a **callus**. This callus is then treated with different **hormones** to develop roots and shoots.

These small plants are then planted in soil and grown as normal plants.

It is used to grow orchids but is expensive and very specialised.







**Sexual (seed)****Asexual (vegetative)**

<b>Advantages</b>	<b>Disadvantages</b>
Offspring show variations from parents(Allowing evolution)	No variations may be good for grower(Does not evolve)
Some plants may be resistant to disease	All can get the same disease
Less competition due to seed dispersal	Overcrowding and competition
Some seeds may remain dormant in soil	No seeds formed (no dormancy)
<b>Disadvantages</b>	<b>Advantages</b>
Complex Process	Simple process
Depends on outside agents (e.g. insects)	No outside agents needed (wind or insects)
Slow growth from young to mature	Rapid growth as plants attached to parents
Wasteful in energy (petals, fruit, etc.)	No energy wasted