

World of Plants *Checklist*

Growing Plants (*Credit level)

1. A dicotyledon **seed** contains
 - (i) a **seed coat** (for **protection**)
 - (ii) an **embryo** (which grows into the **new plant**)
 - (iii) a **food store** (usually starch to supply the embryo with **energy for growth**).

2. The stages involved in **germination** are
 - (i) the seed **swells** as it takes in water
 - (ii) the **root grows downwards** to take in water and minerals
 - (ii) the **shoot grows upwards** to reach the light and start photosynthesis.

3. The **conditions** required for germination are
 - (i) a **suitable temperature** (warmth)
 - (ii) **oxygen (o)**
 - (iii) **water (w)**

REMEMBER - WOW

You should also remember the experiment you did to show that these conditions are necessary.

- 4*. There is an **optimum temperature** for germination which differs according to the plant type (eg hot desert cacti will have a higher optimum temperature than cold alpine plants).
You should be able to work this out from a graph of % germination against temperature.

5. The main parts of a **flower** are *sepals, nectary, petals, stamens (with anther), stigma, ovary*.

6. The **male** part of the flower is the **stamen** (containing the **anther**) and the **male gametes** are the **pollen grains**.
The **female** parts of the flower are the **stigma** and **ovary** and the **female gametes** are the **ovules**.

10. **Insect** pollination involves an insect (bee, ant, beetle etc) transferring pollen grains from anther to stigma.
Wind pollination involves anthers blowing in the wind which carries the pollen grains to the stigmas

- 11*. An insect pollinated plant has
- (i) **bright petals** and a **smell** to attract insects
 - (ii) a **nectary** to supply insects with sugary food
 - (iii) anthers **inside** the petals to dust the insects with pollen
 - (iv) **sticky** stigma to allow the pollen grains to attach

A wind pollinated plant has

- (i) **dull petals** and **no smell or nectary** since no insects have to be attracted to it
 - (ii) **large anthers** hanging outside the petals so that the wind can blow the pollen grains away
 - (iii) a **feathery stigma** hanging outside the petals to trap the pollen grains as they blow past.
12. **Pollination** occurs when a pollen grain lands on a stigma.
Fertilisation occurs when it grows a **pollen tube** down to the ovary and the **male nucleus** travels down to the ovule and **fuses** with the **female nucleus** to form a **zygote**.
13. Following fertilisation the zygote divides to become the **embryo plant**, while the ovule develops into the **seed** and the ovary wall becomes the **fruit**.
14. The fruit is adapted for **dispersal** of the seeds.
15. **Dispersal mechanisms** include **wind** (eg sycamore, dandelion), **animal internal** (eg blackberry, raspberry), **animal external** (eg burdock, sticky willy), **self** (eg broom, pea).
16. **Asexual** reproduction only involves one parent.
17. All the offspring from asexual reproduction are **identical** to each other and to the parent plant.
They form a **clone** (organisms that are genetically identical to each other).
18. Asexual reproduction in plants is also known as **vegetative propagation**
19. Tubers are underground food stores produced by asexual reproduction (eg potato).
Runners are horizontal stems from a parent plant produced by asexual reproduction (eg spider plant, strawberry).
20. Underground **food stores** also acts as an “over-wintering” device which allows rapid growth in the spring.
- 21*. Two **advantages** of sexual reproduction are
- (i) variation occurs - all offspring are not identical
 - (ii) offspring are well spread out - overcrowding and competition do not occur

- 22*. Two **advantages** of asexual reproduction are
- (i) offspring receive food from parent plant until they are established
 - (ii) offspring grows in an environment that is suitable (since parent grows there)
23. **Artificial propagation** is used when a gardener wishes to increase his stock of plants cheaply.
24. Artificial propagation involves
- (i) taking **cuttings** - a stem cutting is taken and rooted in water or has rooting hormone added to it to encourage growth of roots. The plant grows into an identical one to the parent.
 - (ii) **grafting** - a stem cutting or bud is attached to a wild variety which has a good root system since the graft does not grow well by itself.
- 23*. **Advantages** to humans of producing new plants by artificial propagation include
- (i) **guarantee of uniformity** - once a suitable plant has been produced by sexual reproduction (rose or fruit tree) it can be artificially propagated in vast amounts for sale.
 - (ii) many cultivated plants are sterile. Artificial propagation **allows vast numbers to be produced** (eg seedless grapes, citrus fruits)
 - (iii) **conservation** - plants under threat in their natural environment can be reproduced artificially in an effort to save them from extinction.