# CHAPTER 16 - PART A
# SEXUAL VS ASEXUAL REPRODUCTION AND PLANT REPRODUCTION

## The stuff you need to know in this chapter:

### 16.1 ASEXUAL REPRODUCTION

***Core***

- Define asexual reproduction as a process resulting in the production of genetically identical offspring from one parent
- Identify examples of asexual reproduction from information provided

***Extended***

- Discuss the advantages and disadvantages of asexual reproduction:
  - to a population of a species in the wild
  - to crop production

### 16.2 SEXUAL REPRODUCTON

***Core***

- Define sexual reproduction as a process involving the fusion of the nuclei of two gametes (sex cells) to form a zygote and the production of offspring that are genetically different from each other
- Define fertilisation as the fusion of gamete nuclei

***Extended***

- State that the nuclei of gametes are haploid and that the nucleus of a zygote is diploid
- Discuss the advantages and disadvantages of sexual reproduction:
- - to a population of a species in the wild
- - to crop production

## 16.3 SEXUAL REPRODUCTION IN PLANTS

### *Core*

- Identify and draw, using a hand lens if necessary, the sepals, petals, stamens, filaments and anthers, carpels, style, stigma, ovary and ovules, of an insect-pollinated flower
- State the functions of the sepals, petals, anthers, stigmas and ovaries
- Use a hand lens to identify and describe the anthers and stigmas of a wind-pollinated flower
- Distinguish between the pollen grains of insect-pollinated and wind-pollinated flowers
- Define pollination as the transfer of pollen grains from the anther to the stigma
- State that fertilisation occurs when a pollen nucleus fuses with a nucleus in an ovule
- Describe the structural adaptations of insect-pollinated and wind-pollinated flowers
- Investigate and state the environmental conditions that affect germination of seeds, limited to the requirement for water, oxygen and a suitable temperature
-

### *Extended*

- Define self-pollination as the transfer of pollen grains from the anther of a flower to the stigma of the same flower or different flower on the same plant
- Define cross-pollination as transfer of pollen grains from the anther of a flower to the stigma of a flower on a different plant of the same species
- Discuss the implications to a species of self-pollination and cross-pollination in terms of variation, capacity to respond to changes in the environment and reliance on pollinators
- Describe the growth of the pollen tube and its entry into the ovule followed by fertilisation (details of production of endosperm and development are **not** required)

## 16.1 and 16.2 SEXUAL AND ASEXUAL REPRODUCTION

1. Define sexual reproduction

2. Using examples, explain what is meant by "diploid" and "haploid"

3. Define "fertilization"

4. Define asexual reproduction

5. Complete the table to outline the advantages and disadvantages of sexual and asexual reproduction in plants

| | Asexual reproduction | | Sexual Reproduction | |
|---|---|---|---|---|
| | For crop plants | For plants in the wild | For crop plants | For plants in the wild |
| Adv. | | | | |
| Disadv. | For crop plants | For plants in the wild | For crop plants | For plants in the wild |

6. Decide which type of reproduction is being described. Put an "A" if the example is asexual reproduction and "S" if the example is sexual reproduction.

| A/S? | Description |
|---|---|
| | Natural conception and birth of a human baby. |
| | Production of a human baby using *in vitro* fertilization. This involves taking a sperm and egg cell, and fertilizing them in laboratory conditions, before implanting the embryo. |
| | The natural conception and birth of human monozygotic twins ("identical twins") |
| | The propagation of plants from cuttings. This involves taking a cutting from the stem of a plant and putting in the soil to grow as a new plant |
| | The natural growth of a new plant from a potato tuber |
| | Production of new bacteria by binary fission. Binary fission is basically the cell division of a parent cell to produce two daughter cells. |

## 16.2 REPRODUCTION IN PLANTS

1. Distinguish between "plant" and "flower".

2. Produce a scientific drawing of a flower showing both the male and female parts

3. State the function of the following parts of a flower.

| | |
|---|---|
| Sepals | |
| Petals | |
| Anthers | |
| Stigmas | |
| Ovaries | |

4. Draw a flow diagram (boxes and arrows) to summarize the stages of reproduction in flowering plants from pollination to germination

5. Distinguish between pollination and fertilization in plants

6. Use diagrams to summarise self-pollination vs cross pollination.

7. Compare and contrast (state similarities and differences) the flowers of insect and wind pollinated plants.

8. State one advantage and two disadvantages of self-pollination

9. Define germination

10. Describe an investigation to test for the conditions required for seed germination. Include the results you would expect:

Results: