ASEXUAL REPRODUCTION

- Asexual Reproduction is the formation of a new organism where there is the presence of a single parent, and no joining of gametes (e.g. sperm, pollen, egg). The offspring has identical genes and chromosomes to the parent.
- Advantages of Asexual Reproduction – No energy is expended to find a mate. There is a high chance of survival of the offspring, if the offspring remains near the parent in a stable environment.
- Disadvantages of Asexual Reproduction – Less genetic diversity gives the offspring a lesser chance of survival if the environment changes.

For the next examples, refer to your textbook for diagrams.

- 6 Examples of Asexual Reproduction –
  1. Binary Fission (e.g. of bacteria and *Amoeba*) occurs when a cell simply grows larger, replicates its DNA in genes and chromosomes, and then forms a cell membrane down the mid-section of the cell to form 2 new 'daughter' cells.
  2. Budding (e.g. of yeast and hydras) occurs when a small part of the parent's body separates from the rest and develops into a new individual, eventually either becoming an independent organism or part of an attached colony.
  3. Spore Formation (e.g. of ferns, malaria-causing protozoan called *Plasmodium)* occurs where special cells with resistant coverings form. These coverings are resistant to unfavourable environmental conditions such as heat, cold or dryness.
  4. Fragmentation (e.g. of flatworms and starfish) occurs when a parent body is broken into pieces, and each piece may form a new individual.
  5. Regeneration (e.g. of many plants) occurs when part of an organism grows to form other organisms that are often still connected to the original organism. Examples of regeneration in plants are the vegetative propagation of runners of grasses and strawberries, rhizomes in ferns, tubers in potatoes, and growing plants from cuttings.
  6. Parthenogenesis (e.g. of bees, wasps, some cockroaches, and liver flukes inside a host) occurs when a new organism develops from an unfertilised egg. For example, in honeybees, the female or queen honeybee is inseminated just once in her lifetime. The sperm she receives are stored in a little pouch connected to the genital tract, and closed off by a muscular valve. As the queen lays eggs, she can either open this valve permitting sperm to fertilise them (to become female queens or female workers), or she can keep the valve closed so that unfertilised develop into male drones.

SEXUAL REPRODUCTION

- Sexual Reproduction is the formation of a new organism from 2 parents usually, and involves the joining of gametes (e.g. sperm, pollen, egg) to form a single cell called a zygote (or fertilised egg). The offspring are similar, but not identical to the parents.
- Advantages of Sexual Reproduction – There is greater genetic variation of the offspring and therefore, greater chance of survival in changing environments.

- Disadvantages of Sexual Reproduction – Energy is expended in finding a mate in many organisms. However some organisms have both male and female reproductive organs that are able to produce gametes simultaneously.

An Example of Sexual Reproduction (Hermaphroditism)

- Hermaphroditism (e.g. tapeworms, earthworms, oysters) occurs in organisms with both male and female reproductive organs.
- e.g. Tapeworms that are parasitic and live inside a host have the ability to self-fertilise with both male and female reproductive organs capable of producing male and female gametes at the same time.
- e.g. Earthworms also possess both male and female reproductive organs, but do not self-fertilise. They copulate, and each inseminates the other.
- e.g. Oysters also do not self-fertilise. In their lifetime, they are first male, and then female.

*Did You Know That…?*There does not have to be a rooster in a hen-house for the hens to lay eggs. If there is no rooster, the eggs are unfertilised and they do not grow into new organisms. If there is a rooster, the eggs will be fertilised, can be incubated and will grow into chickens.