*This is the **Higher Combined** version — includes Higher Tier content. Some Separate-only details are omitted.*

There are two fundamentally different ways organisms reproduce, each with distinct advantages depending on the environment.

- Asexual reproduction: requires ONE parent only. Offspring are genetically IDENTICAL to the parent (clones). Uses mitosis.
- Examples of asexual reproduction: bacteria (binary fission), strawberry plants (runners), potato plants (tubers), hydra (budding), yeast (budding).
- Advantages of asexual: fast, energy-efficient (no need to find a mate), all offspring can reproduce, identical offspring if environment is stable.
- Sexual reproduction: requires TWO parents. Gametes fuse (fertilisation). Offspring are genetically DIFFERENT from each other and from parents. Uses meiosis.
- Advantages of sexual: generates genetic variation → populations more adaptable to changing environments → better resistance to new diseases or environmental changes.
- Many organisms can reproduce both ways: E.g. strawberry plants use runners (asexual) and flowers/seeds (sexual).

★ **HT** The meiotic division and fertilisation together ensure that offspring have unique combinations of alleles.

Key Terms

Asexual reproduction	Reproduction from one parent — offspring are genetically identical (clones) — uses mitosis
Sexual reproduction	Reproduction involving two parents and fusion of gametes — offspring are genetically varied — uses meiosis
Clone	A genetically identical copy of an organism
Fertilisation	Fusion of male and female gametes — combines genetic material from two parents

■ **Exam Tip:** Asexual = fast, no variation (BAD if environment changes). Sexual = slower, produces variation (GOOD for adapting to change). This trade-off is a common exam discussion point.