Your notes

GCSE Biology: revision notes

Sexual and asexual reproduction, meiosis

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Sexual reproduction

- **Sexual reproduction** involves the joining (fusion) of male and female **gametes**: sperm and egg cells in animals, pollen and egg cells in flowering plants.
- **Gametes** are made by **meiosis**. Because genetic information from two parents is mixed, the offspring show **variation**.

Asexual reproduction

- **Asexual reproduction** involves only one parent and no fusion of **gametes**.
- There is no mixing of genetic information, so the offspring are genetically identical to the parent and each other (**clones**).
- Only mitosis is involved.

Meiosis

- **Meiosis** happens in the reproductive organs (ovaries and testes) and halves the number of chromosomes in **gametes**.
- First the genetic information is copied. Then the cell divides twice to form four **gametes**, each with a single set of chromosomes.
- All the **gametes** are genetically different from each other.
- At **fertilisation**, **gametes** join to restore the normal number of chromosomes. The new cell divides by mitosis, and as the embryo develops its cells differentiate.

Comparing the two (separate sciences)

- Advantages of **sexual reproduction**: it produces **variation**, so if the environment changes some offspring may survive (natural selection); humans can use it in selective breeding.

- Advantages of **asexual reproduction**: only one parent is needed; it is faster and uses less time and energy; many identical offspring can be produced when conditions are good.
- Some organisms do both. Malaria parasites reproduce asexually in the human host and sexually in the mosquito. Many fungi reproduce asexually by **spores** and sexually to give **variation**. Many plants make seeds sexually and also reproduce asexually by **runners** (strawberries) or bulb division (daffodils).

Your notes

Key terms

Sexual reproduction	Reproduction involving the fusion of male and female gametes.
Asexual reproduction	Reproduction with one parent and no gametes, giving identical offspring.
Gamete	A sex cell (sperm, egg or pollen nucleus) with half the normal number of chromosomes.
Meiosis	Cell division that makes four genetically different gametes, each with half the chromosome number.
Fertilisation	The fusion of a male and female gamete.
Clone	An organism genetically identical to its parent.
Variation	Differences between individuals of the same species.
Runner	A stem that grows along the ground and forms new plants asexually.
Spore	A cell released by fungi that can grow into a new organism.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. How many parents are involved in asexual reproduction?
2. What type of cell division makes gametes?
3. How many cells does meiosis produce from one cell?
4. How many chromosomes are in a human egg cell?
5. Why does sexual reproduction produce variation?
6. What happens to the chromosome number at fertilisation?
7. Which is an advantage of asexual reproduction?
8. How do strawberry plants reproduce asexually?

Answers

1. One
2. Meiosis
3. Four
4. 23

5. Genetic information from two parents is mixed
6. It is restored to the full number
7. It is faster and needs only one parent
8. By runners

What to do next

Practise 11 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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