

Reproduction and meiosis

Revision notes • How meiosis makes four genetically different gametes with half the number of chromosomes, and how fertilisation restores the full number.

For Edexcel GCSE Combined Science 1SC0. **Higher tier** is only on the Higher paper.

Reproduction and meiosis Spec 3.1B-3.3

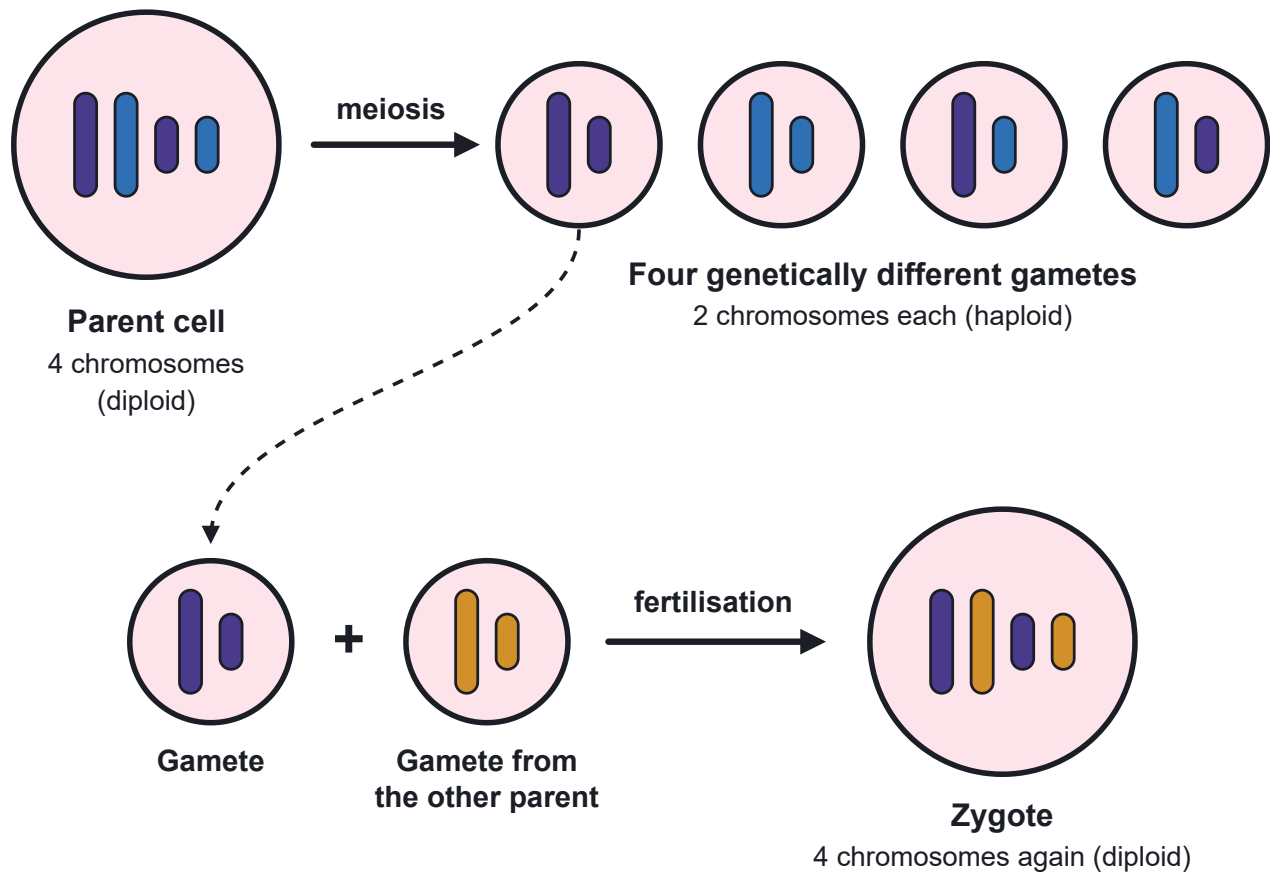
Meiosis Spec 3.3

Meiotic cell division (meiosis) is the type of cell division that makes gametes. In humans it happens in the reproductive organs.

- One parent cell divides to produce **four daughter cells**.
- Each daughter cell has **half the number of chromosomes** of the parent cell.
- The daughter cells are **genetically different** from each other and from the parent cell.
- The daughter cells are **haploid gametes**, with one set of chromosomes.

A human body cell has 46 chromosomes. Meiosis makes sperm and egg cells with 23 chromosomes each. At fertilisation the two gametes fuse and the zygote has 46 chromosomes again, with half from each parent.

Body cells and gametes		
	Body cell (diploid)	Gamete (haploid)
Chromosomes in a human cell	46	23
Genetically identical to the others?	Yes, if made by mitosis	No, each gamete is different
Made by	Mitosis	Meiosis



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Meiosis halves the chromosome number; **fertilisation** restores it in the zygote.

Exam tip: The stages of meiosis are not required. Learn the outcome: four genetically different haploid gametes, each with half the number of chromosomes.

Quick check

1. Give one advantage and one disadvantage of asexual reproduction.
2. Give one advantage and one disadvantage of sexual reproduction.
3. How many daughter cells does one meiotic division produce?
4. How many chromosomes are in a human gamete?

Quick check answers

Reproduction and meiosis

- 1 . Advantage: no need to find a mate (or rapid reproductive cycle). Disadvantage: no variation in the population.
- 2 . Advantage: variation in the population. Disadvantage: the requirement to find a mate.
- 3 . Four.
- 4 . 23, which is half the number in a body cell (46).