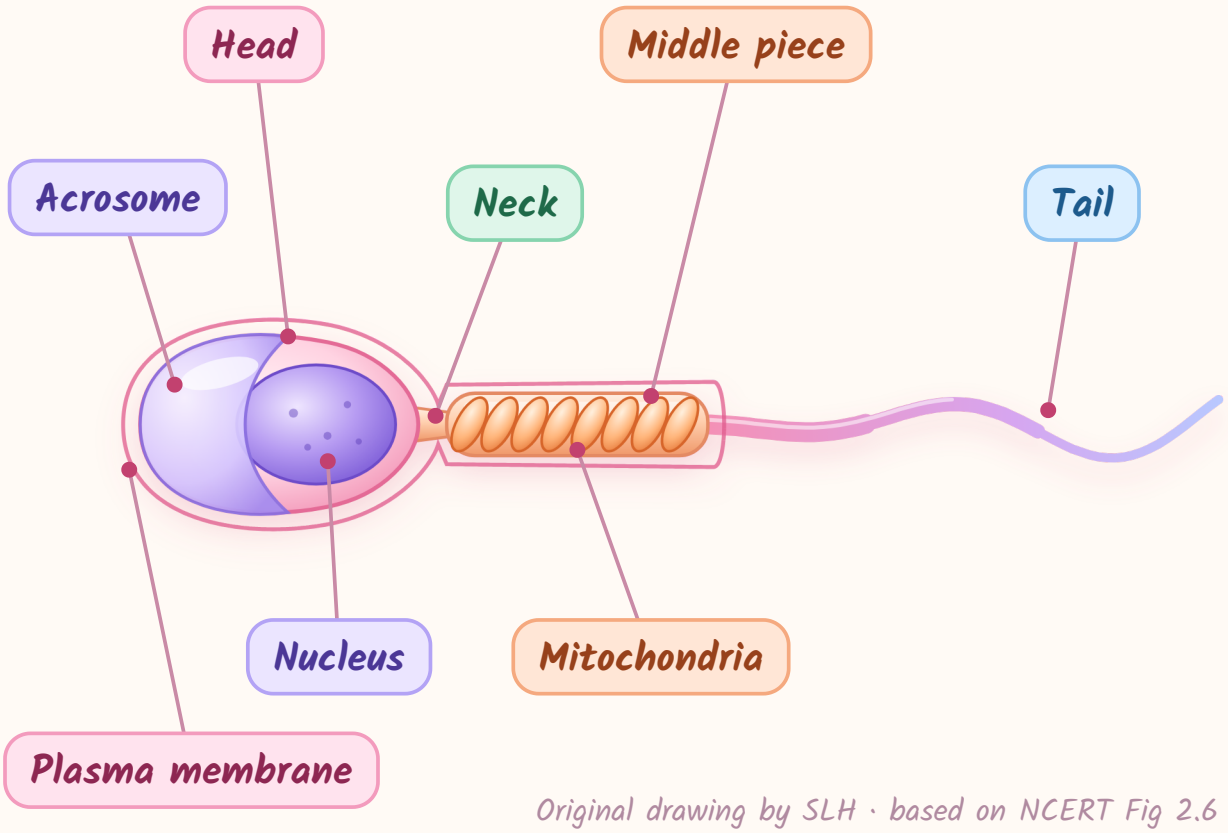
Structure of a Sperm

Head · Neck · Middle piece · Tail — and how sperms are made



Original drawing by SLH · based on NCERT Fig 2.6

Key points ✍️

- **Sperm** — a microscopic cell made of 4 parts: head, neck, middle piece and tail.
- **Plasma membrane** — envelops the whole body of the sperm.
- **Head** — has an elongated haploid nucleus (23 chromosomes).
- **Acrosome** — cap over the front of the nucleus; its enzymes help fertilisation of the ovum.
- **Middle piece** — numerous mitochondria → energy for tail movement.
- **Tail** — gives sperm motility, essential for fertilisation.
- **Spermatogenesis** — making of sperms in the testis; it begins at puberty.
- **Spermatogonia** ($2n = 46$) on the inner wall of seminiferous tubules multiply by mitosis.
- **Meiosis** — primary spermatocyte → meiosis I → 2 secondary spermatocytes (23 chromosomes each) → meiosis II → 4 haploid spermatids.
- **Spermiogenesis** — spermatids are transformed into sperms.
- **Spermiation** — sperm heads first lie embedded in Sertoli cells, then sperms are released from the seminiferous tubules.

- **Hormones** — GnRH rises at puberty → LH acts on Leydig cells (androgens); FSH acts on Sertoli cells (factors that help spermiogenesis).
- **Semen** — sperms + seminal plasma. About 200–300 million sperms per ejaculation; for normal fertility at least 60% must have normal shape and size and at least 40% must show vigorous motility.

💡 Remember

Order of parts, front to back: ***H-N-M-T*** *→ "****H****appy* ***N****ew* ***M****orning* ***T****ea" = Head · Neck · Middle piece · Tail.*

Acrosome = ***enzymes*** *🧪 · Mitochondria =* ***energy*** *⚡*

Source: NCERT Biology Class 12, Ch 2 Human Reproduction (Fig 2.6 Structure of a sperm). Notes and drawing: original work by Simple Learning Hub.