- Head contains genetic material in nucleus and the acrosome which contains strong hydrolytic enzymes which play and important part in fertilisation
- The rest of the sperm is concerned with propulsion (movement)
- An axial filament runs through the centre of the middle piece and tail, consisting of two microtubules surrounded by a circle of nine peripheral ones; the '9+2' structure characteristic of cilia and flagella. The tail is therefore a modified flagellum. The microtubules are surrounded by a circle of solid fibres for strength and the whole thing is enclosed in a ribbed sheath to permit flexibility.
- In the middle piece the microtubules are surrounded by mitochondria arranged in spirals to provide energy for making the tail wave.

Structure of the egg

To receive genetic information and develop into a new individual

- No propulsion involved so the egg has a simpler structure than the sperm.
- It contains enough nutrients, in the cytoplasm, and metabolites to sustain itself through the early stages of development.
- It is just over 0.1mm diameter (100µm)- sperm's head is 2.5µm at widest point
- Has a large haploid nucleus surrounded by cytoplasm with usual cell organelles and enzymes
- Cortical granules are found just beneath the plasma membrane
- Outside the plasma membrane is a glycoprotein coat- **zona pellucida** (transparent, produced by ovary follicle cells)
- A small fluid filled space separates the zona pellucida from the plasma membrane, where polar bodies may be
- Any mitochondria comes from the mother as the sperm only donates the nucleus

Passage of the sperm from testes to oviduct

1. Capacitation- essential changes to sperm surface
2. Acrosome reaction- hyaluronidase enzymes digest a path through the corona radiata (follicle cells) and zona pellucida
3. Fusion between sperm head and plasma membrane of secondary oocyte
4. Cortical reaction- exocytosis of cortical granules alters the zona pellucida to form a fertilisation membrane, preventing entry of more sperm (prevents polyspermy)
5. Secondary oocyte stimulated to complete meiosis II- two haploid nuclei fuse, zygote forms

In the testes, seminiferous tubules are grouped together (of approx. 100). From each bundle one tube emerges to connect the bundle to the epididymis. Each sperm takes 6-12 days to move through the seminiferous tubules and the epididymis, carried by fluid movement (inactive at this point). Chemical changes activate the sperm to become motile. Sperm move due to muscular activity of the tube walls from the epididymis to the vas deferens. They're now able to fertilise an egg but fluid is added from the seminal vesicles, prostate gland and cowper's gland forming semen, increasing fertility.

The sperm enter the female during sexual intercourse. Male sexual excitement (psychological or physical) causes erection of the penis by dilation of arteries entering the penis and the flow of