

Strategies and Structures of Reproduction

- *Define asexual reproduction as the process resulting in the production of genetically identical offspring from one parent.*
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- *Define sexual reproduction as the process involving the fusion of nuclei to form a zygote and the production of genetically dissimilar offspring.*
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- *Identify, on diagrams, the male reproductive system and give the functions of the testes, scrotum, sperm ducts, prostate gland, urethra and penis.*
 - Testes: Sperm production, testosterone production
 - Scrotum: Protect and support the testes, keep sperm forming cells 2°C cooler
 - Sperm ducts: Brings sperm from the testes through the seminal vesicle to the urethra, mixes sperm with fluid from seminal vesicle (semen)
 - Prostate gland: Secretes a clear thin alkaline fluid that further nourishes sperm and neutralises the acidic environment of the female reproductive system
 - Urethra: Convey urine and semen with sperm out of the body
 - Penis: Has erectile tissue for the dingdong to harden when they do the do, copulatory organ for ejaculation of sperms into vagina of female, conveys urine out via urethra
 - Seminal vesicle: Produces semen (fructose) to nourish the sperms
- *Identify the site of sex hormones and gametes in the male and female reproductive system.*
 - Gametes: Male - Sperm, Female - Egg
 - Hormones: Male - Testes, Female - Ovary
- *Identify, on diagrams, the female reproductive system and give the functions of the ovaries, oviducts, uterus, cervix and vagina.*
 - Ovary: Produce eggs, estrogen and progesterone
 - Oviduct: Bring the egg from ovary to uterus via peristaltic movement of walls, site of fertilisation
 - Uterus: Site for development of embryo/foetus
 - Cervix: Entrance for sperm passing from vagina to uterus and fallopian tube, produces mucus to lubricate vagina for intercourse
 - Vagina: Copulatory organ to receive sperm from male, birth canal through which baby is born

Menstrual Cycle

- *Explain the main features of the human menstrual cycle including the development of the follicles and corpus luteum, and cyclical changes to the endometrium*

- Follicle develops from D1-15ish, egg is released, becomes corpus luteum to produce estrogen and progesterone (E/P) to thicken endometrium lining to prep for implantation, degenerates later to cause drop in E/P → good bye blood
- Estrogen (E) is low, pituitary is inhibited → FSH and LH are low. E increases as follicle grows, negative feedback on pituitary, FSH and LH remain low. Spike in E, positive feedback on FSH and LH, FSH and LH spike, LH releases egg. LH increase develops corpus luteum, E/P increase again, high levels of E/P inhibit hypothalamus → no releasing hormone → pituitary inhibited → no FSH and LH (to prevent release of another follicle). E/P thickens endometrium lining for implantation, corpus luteum degenerates if egg isn't fertilised, E/P drop suddenly, BOOM BLOOD BATH. MASSACRE.
- Relate physiological changes during menstruation to the changes in the levels of hormones regulating the cycle (progesterone and estrogen)
 - E/P promotes growth of endometrium and maintains it to prepare for implantation of embryo,

Fertilization, Post-fertilization and Contraception

- Describe fertilization and early development of the zygote in terms of the formation of a ball of cells, which becomes implanted in the wall of the uterus.
- *State the functions of the amniotic sac and the amniotic fluid.*
 - Amniotic sac contains amniotic fluid that acts as liquid shock absorber to protect foetus protects child from physical injury and to lubricate and reduce friction in the vagina and birth canal during birth, also allows foetus to move freely during growth
- *Describe the function of the placenta and umbilical cord in relation to exchange of dissolved nutrients, gases and excretory products. (Structural details are not required)*
 - Placenta is rich in blood supply, transports oxygen and nutrients, produces hormones, removes waste, chorionic villi increase SA:V ratio → faster exchange of oxygen, nutrients, hormones, waste, also produced hCG
 - 2 umbilical veins, 1 umbilical artery (in relation to the foetus)
 - Foetal capillaries are in no way connected to the mother, just very close
- Outline the physical, chemical and behavioural methods of contraception
 - refer to the [other doc](#)

Structure of DNA

- *Describe the structure of DNA*
 - A-T has 2 bonds, C-G has 3 bonds.
 - A and G are purines, T and C are pyrimidines
 - Hydrogen bond between base pairs to allow DNA replication/transcription/translation
 - Phosphodiester/phosphoester bonds between sugar-phosphate to form strong sugar-phosphate backbone and provide stability to DNA molecule

- Anti-parallel makes DNA more stable, bases can be tucked inside.
- *Describe the significance of complementary base pairings*
 - Chargoff's rule states that adenine can only bind with thymine and cytosine with guanine. The bonds between A and T are shorter than that of C and G, keeping a constant width between the two types of base pairings to allow it to coil and form a double helix.

Compare:

Sexual vs Asexual reproduction

Egg vs Sperm

Mitosis vs Meiosis (processes, chromosome number, meiosis 1 vs meiosis 2)

DNA vs RNA

DNA replication vs transcription

- Difference: purpose, product
- Similarity: use dna template, take place in nucleus

Transcription vs translation