

WJEC (Wales) Biology A-level

Topic 4.1 - Sexual Reproduction in Humans

Definitions and Concepts

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Acrosome - An organelle in the tip of a sperm containing hydrolase enzymes which digest the zona pellucida of a secondary oocyte.

Amniotic fluid - The liquid surrounding the embryo in the amniotic sac that protects the fetus and acts as a shock absorber.

Blastocyst - A ball of cells that arises from the repeated mitotic divisions (cleavage) of a zygote.

Cervix - A neck of tissue that connects the uterus and the vagina and protects the fetus.

Chorionic villi - Finger-like projections that arise from part of the placenta known as the chorion and provide a large surface area for the exchange of products between maternal and fetal blood.

Corona radiata - An outer layer of follicular cells that protect the secondary oocyte in the oviduct.

Corpus luteum - A mass of cells that forms from the Graafian follicle after ovulation. It serves as a temporary endocrine structure during pregnancy, secreting progesterone.

Cortical granules - Secretory organelles found in oocytes that, upon entry of a sperm, fuse with the plasma membrane and harden the zona pellucida to prevent polyspermy.

Endometrium - The inner lining of the uterus, which, during the menstrual cycle, thickens in preparation for embryo implantation.

Epididymis - A coiled tube in the male reproductive system that links a testicle to a vas deferens and stores sperm prior to ejaculation.

Female reproductive system - An organ system in females that includes the ovaries, oviducts, uterus, endometrium, cervix and vagina.

Fertilisation - The fusion of the nuclei of a male and female gamete to form a zygote.

Follicle-stimulating hormone (FSH) - A hormone secreted by the anterior pituitary gland that binds to follicle cells, stimulating them to mature and secrete oestrogen.

Gametogenesis - A sequence of nuclear and cellular divisions that result in the production of gametes.

Germinal epithelium - A surface layer of cells surrounding the ovaries in females and testicles in males that is involved in gametogenesis.

Graafian follicle - A mature fluid-filled follicle in the ovary within which an egg cell develops.

Human chorionic gonadotropin (hCG) - A hormone secreted by the developing embryo that maintains the corpus luteum during early pregnancy.



Implantation - The early stage of pregnancy in which the blastocyst adheres and sinks into the endometrium.

Intervillous spaces - Spaces between the chorionic villi that contain maternal blood.

Leydig cells - Cells located adjacent to the seminiferous tubules in the testes that secrete testosterone. Also known as interstitial cells of Leydig.

Luteinising hormone (LH) - A hormone secreted by the anterior pituitary gland that initiates ovulation and stimulates the development of the Graafian follicle into a corpus luteum.

Male reproductive system - An organ system in males which includes the scrotum, testes, epididymis, vas deferens, seminal vesicles and prostate gland.

Menstrual cycle - The monthly cycle in women that involves the development of the endometrium, ovulation and the shedding of the endometrium.

Oestrogen - A female sex hormone secreted by a mature follicle that inhibits the production of FSH and causes a surge in LH production. During pregnancy, it stimulates uterine growth and the development of the mammary glands.

Oogenesis - Gametogenesis in females that takes place in the ovaries and results in the production of secondary oocytes.

Oogonia - Immature female reproductive cells that have formed from primordial germ cells and mature to give primary oocytes.

Ovary - An organ in the female reproductive system responsible for the production of egg cells in follicles.

Oviducts - The tubes that transport egg cells from the ovaries to the uterus. They are the site of fertilisation and are commonly known as fallopian tubes.

Ovulation - The release of an ovum from a mature ovarian follicle into the oviduct.

Ovum - The female haploid gamete produced by gametogenesis.

Oxytocin - A hormone secreted by the posterior pituitary gland that triggers the contraction of the uterus wall. It is controlled by a positive feedback mechanism.

Penis - The male sex organ that penetrates the vagina and releases sperm.

Placenta - A temporary organ attached to the lining of the uterus during pregnancy. It has a variety of roles including the exchange of gases and nutrients, serving as a barrier between fetal and maternal blood, and hormonal control.

Polar body - A haploid cell produced during meiosis in females that does not have the ability to be fertilised.

Primary follicle - An immature ovarian follicle surrounded by two layers of follicular cells.



Primary oocyte - A diploid oocyte that has undergone growth but has not completed its first meiotic division.

Primary spermatocyte - A diploid spermatocyte that has undergone growth but has not completed its first meiotic division.

Progesterone - A female sex hormone secreted by the corpus luteum that causes the development of the endometrium and inhibits the production of FSH and LH. During pregnancy, it suppresses contractions of the uterine wall.

Prolactin - A hormone secreted by the anterior pituitary gland that stimulates lactation during and after birth.

Prostate gland - A gland found between the bladder and the penis that secretes an alkaline fluid to neutralise vaginal acidity.

Scrotum - A pouch of skin that holds and maintains an optimum temperature for the testes.

Secondary follicle - A larger follicle that has developed from a primary follicle.

Secondary oocytes - Haploid cells that have completed meiosis 1.

Secondary spermatocytes - Haploid cells that have completed meiosis 1 and give rise to spermatids.

Seminal vesicles - A pair of glands in the male reproductive system that secrete a protein- and fructose-rich fluid to nourish sperm.

Sertoli cells - Cells located within the seminiferous tubules in the testes that provide nourishment and protection to cells produced during spermatogenesis.

Sexual intercourse - The entry of the male reproductive organ and the deposition of sperm into the female reproductive tract.

Spermatid - A haploid cell that results from the completion of the second meiotic division in spermatogenesis.

Spermatogenesis - Gametogenesis in males that takes place in the seminiferous tubules and results in the production of spermatozoa.

Spermatogonia - Immature male reproductive cells that have formed from primordial germ cells and mature to give primary spermatocytes.

Spermatozoa - The male haploid gamete produced by spermatogenesis.

Testes - A pair of organs in the male reproductive system that produce sperm and testosterone.

Umbilical artery - A paired artery that carries deoxygenated blood from the fetus to the placenta.



Umbilical vein - A vein that takes oxygenated blood from the placenta to the fetus.

Urethra - A tube responsible for the transfer of urine during urination (in both males and females) and semen during ejaculation (in males).

Uterus - The organ in the female reproductive system in which the embryo develops.

Vagina - The canal that extends from the cervix to the outside of the body. During sexual intercourse, it stimulates the penis to ejaculate.

Vas deferens - A tube in the male reproductive system that transfers sperm from the epididymis during ejaculation.

Zona pellucida - A glycoprotein layer surrounding the plasma membrane of a secondary oocyte that provides protection and prevents polyspermy.

Zygote - A diploid cell formed by the fusion of a haploid oocyte and spermatozoa during fertilisation.

