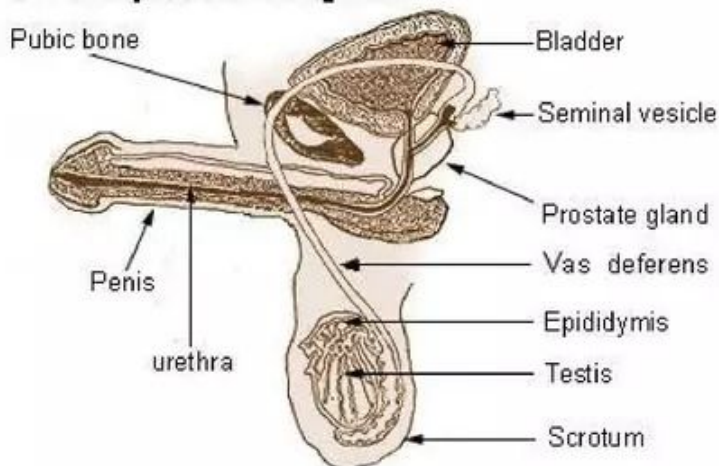


IGCSE Coordinated Science: Sexual Reproduction in Humans

1. Identify on diagrams of the male reproductive system, the testes, scrotum, sperm ducts, prostate gland, urethra and penis, and state the functions of these parts.

Male Reproductive System



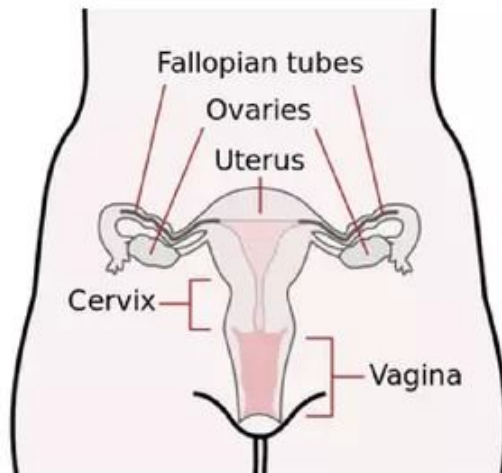
- Testes- Produces sperm and male sex hormone, testosterone
- Scrotum- sack of skin which holds the testis
- Sperm duct- carries sperm from testes to urethra
- Prostate gland- produces alkaline fluid to add to sperm to make semen.
- Urethra-carries semen to the penis.
- Penis- transfers sperm into vagina

2. Compare male and female gametes in terms of size, numbers and mobility.

- Sperm: Millions, Very fast, small

- Egg Cell: Usually 1, big, stationary

3. Identify on diagrams of the female reproductive system, the ovaries, oviducts, uterus, cervix and vagina, and state the functions of these parts.



- Ovaries– This is where the eggs are stored and hormone is produced.
- Oviducts/fallopian tube– This is where fertilization happens. The egg travels along the oviduct during ovulation, which happens after a woman has her menstruation.
- Cervix- lower part of the uterus
- Vagina- sperm is deposited in the vagina during sexual intercourse
- Uterus– is able to expand and holds the embryo/ baby

4. Describe fertilisation in terms of the joining of the nuclei of male gamete (sperm) and the female gamete (egg).

Fertilisation happens when a male gamete (sperm) penetrates the wall of the female gamete (egg)

5. Outline early development of the zygote simply in terms of the formation of a ball of cells that becomes implanted in the wall of the uterus.

A single sperm cell penetrates the mother's egg cell, and the resulting cell is commonly called a **zygote**. A zygote contains all the genetic information necessary for one to become a child. Half of the genetic information comes from the mother's egg and the other half from the father's sperm. The zygote then spends the next few days travelling down the **Fallopian Tube** and then divides to form a ball of cells.

The zygote then continues to divide, creating an inner group of cells with an outer shell. This stage is called **blastocyst**. (**You won't have to know this**). The inner group of cells will form to become an embryo, while the outer cells will become the membrane which will protect the embryo.

The blastocyst arrives at the womb (uterus) around day 5, and implants into the uterine wall on about day 6. At this point in the mother's

menstrual cycle, the lining of the uterus has grown and is prepared to support the baby.

6. Indicate the functions of the amniotic sac and amniotic fluid.

The amniotic sac amniotic fluid protect the embryo inside the womb from shocks of movement. It also protects the embryo/baby from temperature changes of mother.

7. Describe the function of the placenta and umbilical cord in relation to exchange of dissolved nutrients, gases and excretory products (no structural details are required)

- The umbilical cord would carry dissolved food and oxygen to the body as well as carry urea and CO₂ away from the foetus.
- The placenta ensures the exchange between carbon dioxide and oxygen in the baby's bloodstream. This ensures that oxygen can be moved into the bloodstream and carbon dioxide taken away. However, the placenta also ensures that other nutrients are allowed to pass to the baby and other wastes are removed.

8. Describe the advantages and disadvantages of breast-feeding compared with bottlefeeding using formula milk.

Advantages for breast milk

- (passive) immunity / antibodies (to baby) ;

- develops bond between baby and mother ;
- idea of composition matches baby's needs / easier to digest ;
- reduced risk of cancers (child or mother) ;
- cost

Disadvantages of breast milk

- problems in producing enough milk ;
- nipples become painful ;
- cannot delegate to male partner /
- Drugs, nicotine, HIV may be transmitted.

Advantages of Bottle feeding

- Able to produce enough milk when wanted
- More convenient as either parent can feed.
- Parent doesn't need to worry about what to eat.
- Doesn't need to feed as often.

Disadvantages of Bottle feeding

- Cost
- Lack of immunity/antibodies to baby
- harder to digest

9. Describe the methods of transmission of human immunodeficiency virus (HIV), and the ways in which HIV/AIDS can be prevented from spreading.

HIV is transmitted through bodily fluids: blood, semen, vaginal fluid, pre-ejaculate, breast milk. This could be caused by the following factors:

- Unprotected sex (sex without condoms.)
- Using dirty/contaminated needles.
- Contaminated blood transfusion.

HIV is also transmitted from an infected mother to child in the womb (in vitro)

AIDS/HIV can be prevented by

- Abstaining from sex (sometimes, you just have to let go)
- Use male or female condoms correctly each time you have sex
- Use clean needles

10. Outline how HIV affects the immune system in a person with HIV/AIDS.

HIV weakens the immune system by attacking and targeting the body's vital cells in the immunity system such as the helper T cells , macrophages, and dendritic cell.

