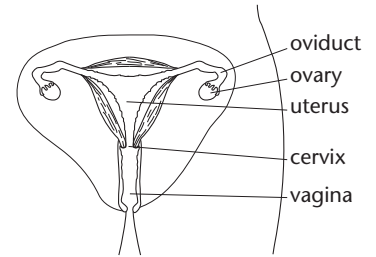


Reproduction

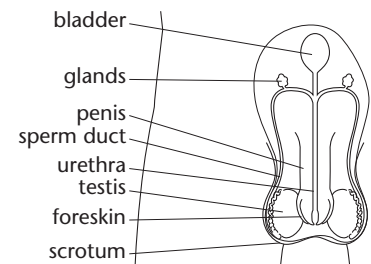
Reproduction produces new living things (**offspring**). Two **parents** (one male and one female) are needed for **sexual reproduction**. The offspring have features from each parent.

The human reproductive systems

Humans have **reproductive organs** so that they can reproduce. The ovaries and testes produce **sex cells**.



Female – ovaries are where the female sex cells (**egg cells**) are produced.



Male – testes are where the male sex cells (**sperm cells**) are produced.

Puberty and adolescence

Sex hormones cause big physical changes to occur during puberty.

Changes in boys	Changes in girls
• hair grows under arms, on face and on chest	• hair grows under arms
• pubic hair grows	• pubic hair grows
• shoulders get wider	• hips get wider
• body smell increases	• body smell increases
• testes start to make sperm cells	• ovaries start to release egg cells
• testes and penis get bigger	• breasts develop
• voice deepens ('breaks')	

Adolescence is the time when puberty is occurring and emotional changes happen. It starts between the ages of 10 and 15 and ends at about 18. The changes start sooner in girls. After puberty, men produce sperm cells for the rest of their lives. Women stop releasing egg cells at the age of 45–55. This is called the **menopause**.

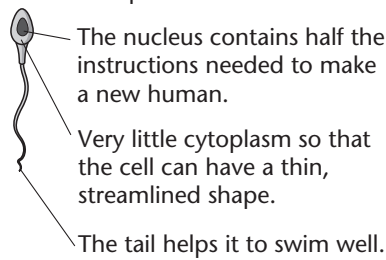
The menstrual cycle

The **menstrual cycle** starts with **menstruation** (the loss of the uterus lining and some blood through the vagina). It takes 28–32 days for each cycle. About 14 days after menstruation starts, an egg cell is released from an ovary. This is called **ovulation**. If the egg cell is not fertilised, the uterus lining starts to break down and the cycle starts again.

Sex

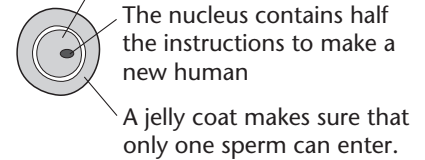
The sperm cells enter the **vagina** during **sexual intercourse**. **Semen** (sperm cells mixed with special liquids from the **glands**) is forced out of the penis and into the top of the vagina. This is called **ejaculation**. The semen is moved into the top of the uterus and the sperm cells can swim down the oviducts.

Sperm cells and egg cells are **adapted** to their **functions**. A sperm cell is much smaller than an egg cell.



A sperm cell.

The cytoplasm contains a store of food to provide energy for the fertilised egg cell.



An egg cell.

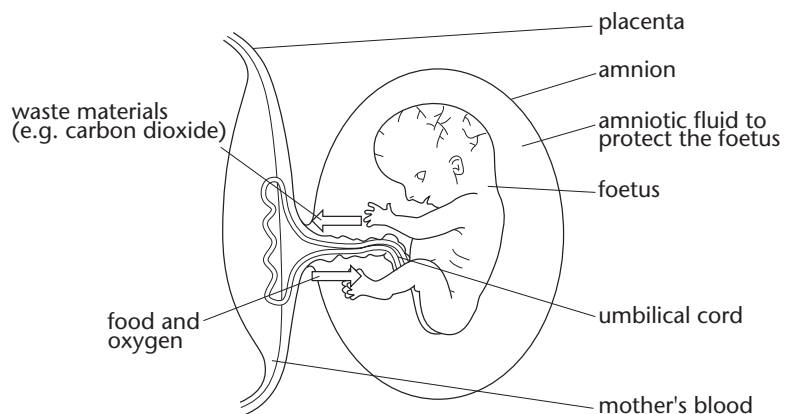
Pregnancy

If the egg cell meets a sperm cell in an oviduct, **fertilisation** can occur (the nuclei from the two cells **fuse**). The **fertilised egg cell** divides to form a ball of cells (an **embryo**). The embryo travels to the uterus where it sinks into the soft lining (**implantation**). The woman is now **pregnant**. Once it has developed all its organs (after about 10 weeks) it is called a **foetus**. It takes about 40 weeks (9 months) for a fertilised egg cell to grow into a baby ready to be born. This time is called the **gestation period**.

The fertilised egg cells of many animals grow and develop outside their parents. This is called **external development**. Frogs use external development. Humans use **internal development** and produce fewer offspring than animals using external development because the growing embryos are protected inside the mother.

While inside the uterus, the foetus is supplied with oxygen and food by the **placenta**. The placenta also gets rid of waste (especially carbon dioxide) from the foetus. The **cord** (or **umbilical cord**) connects the foetus to the placenta.

If a mother smokes, drinks too much alcohol or takes drugs while pregnant, she might damage the baby. The baby might be **premature**.



Birth

When the baby is ready to be born, the uterus starts **contractions** and the woman goes into **labour**. The muscles of the cervix relax. The baby is pushed out head first through the cervix and the vagina. After birth, the baby starts to breathe and the cord is cut. The scar left behind is the **navel**. After this, the placenta is pushed out of the uterus. This is the **afterbirth**. The mother's breasts contain **mammary glands** that produce milk to feed the baby. Breast milk contains **antibodies** that help destroy microbes that might cause a disease in the baby.