

Reproduction

Puberty

Puberty is the stage in life when a child's body develops into an adult's body. The changes take place gradually, usually between the ages of 10 and 16.

Changes occur at puberty because of hormones:

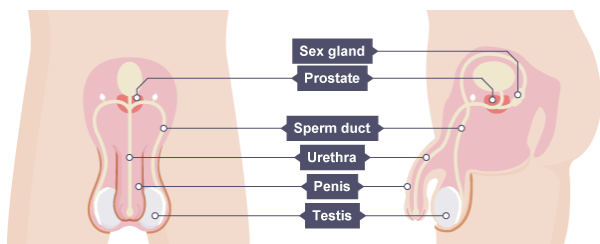
- **testosterone** - produced by the testes - controls the development of male secondary sexual characteristics
- **oestrogen** - produced by the ovaries - controls the development of female secondary sexual characteristics

Changes during puberty

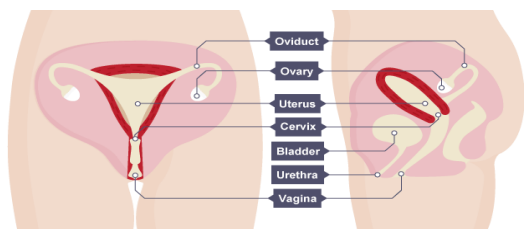
Boys only	Boys and girls	Girls only
Voice breaks	Pubic hair grows	Voice deepens gradually
Hair grows on face and body	Underarm hair grows	Hips get wider
Body becomes more muscular	Sexual organs grow and develop	Breasts develop
Testes start to produce sperm cells		Ovaries start to release egg cells - menstruation starts

Humans reproduce using sexual reproduction involving a man and a woman.

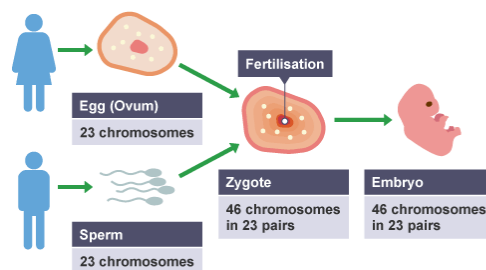
The male reproductive system - is adapted to deliver sperm (male gamete) to the female reproductive system, where it will fertilise the egg (female gamete)



The female reproductive system - is adapted to receive sperm, which will eventually fertilise the egg. It is also adapted to allow an embryo, which will then become a fetus and a baby to grow to full term.

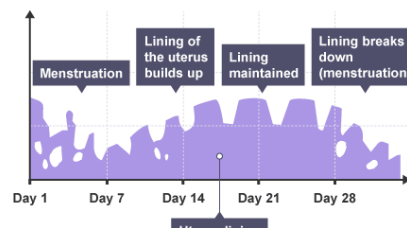


Fertilisation is the fusion of the nucleus of a male gamete with the nucleus of a female gamete, producing a new cell called a zygote. This then matures into an embryo



The menstrual cycle is an approximately 28 day cycle that prepares the female body for pregnancy. Hormone levels change during the cycle. If the egg does not fertilise, bleeding will occur which is day 1 of the menstrual cycle. This bleeding is known as having a period.

Day (approx)	Event
1	Bleeding from the vagina begins. This is caused by the loss of the lining of the uterus. This is called menstruation or having a period.
5	Blood loss stops. The lining of the uterus begins to re-grow and an ovum starts to mature in one of the ovaries.
14	Ovulation occurs. The ovum travels through the oviduct towards the uterus.
28	If the ovum does not join with a sperm cell in the oviduct, the lining of the uterus begins to break down again and the cycle repeats.



If fertilisation occurs, the newly-formed zygote (fertilised egg) divides repeatedly to form a ball of cells called an embryo. This becomes implanted in the wall of the uterus.

After eight weeks of development, the embryo is called a **fetus** (also spelt 'foetus' but pronounced the same). The **amniotic sac** produces **amniotic fluid**, which surrounds and protects the developing embryo.



A **placenta**, connected by an umbilical cord, develops from the embryo. The placenta anchors the embryo in the uterus. It also allows:

- nutrients and oxygen to move from the mother to the embryo
- waste materials and carbon dioxide to move from the embryo to the mother

There is no physical connection between the circulatory systems of the embryo and its mother, so their blood doesn't mix. These materials pass from one to the other by diffusion.

