GENES

Variation

- The differences in characteristics of living things is known as **variation**
- There is a large amount of variation between different **species**, but within species many more characteristics are shared
- Even though two organisms may look the same, they will always have variation between them

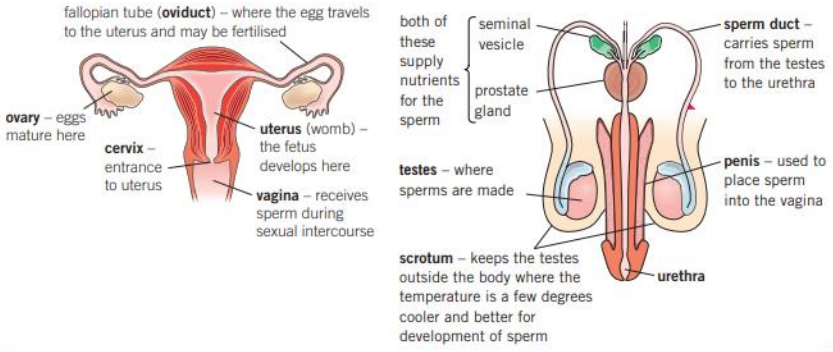
Inherited variation	Environmental variation
• Is anything that comes directly from your parents, anything that you inherit • Examples can include lobe less or lobed ear lobes and eye colour	• Is any type of variation that is caused by your surroundings • Factors that can cause environmental variation include diet, education and lifestyle

- Environmental factors can also impact inherited factors, for example a poor diet can affect height or your exposure to the sun can affect skin tone
- Characteristics which are inherited and not affected by environmental variation include natural eye colour, blood group and genetic diseases

Adaptations

- **Adaptations** are characteristics which organisms have developed to best survive in their surroundings
- Organisms with the best suited adaptations can breed and pass these on
- Those who are not best adapted will die out and not be able to pass on their genes

Reproductive systems

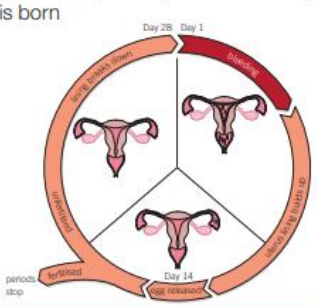


Adolescence

- **Adolescence** is the process in which a child changes into an adult, it involves both physical and emotional changes
- The physical changes alone in this time are known as **puberty**, these are caused by **sex hormones**

The menstrual cycle

- The **menstrual cycle** is the process in which an egg is released from an ovary and leaves through the vagina
- Day 1: blood from the uterus lining leaves through the vagina, which is known as a **period**
- Day 5: the bleeding stops and the uterus lining starts to re-grow
- Day 14: an egg is released from one of the ovaries during **ovulation**
- If the egg is **fertilised** than the menstrualcycle stops until the baby is born



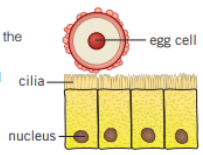
Fertilisation, implantation and gestation

- Egg cells and sperm cells are also called **gametes**, and each contains half the genetic information needed to form a complete organism.

Egg cells

An egg is released by the ovaries every month

The egg cell is moved along the oviduct towards the uterus by **cilia**



Sperm cells

Sperm cells are produced in the testicles/testes

Sperm are mixed with nutrients and fluid from the glands to form **semen**

During sexual intercourse a man will release semen into the vagina (**ejaculation**)

If a sperm meets the egg **fertilisation** may happen

The fertilised egg may then **implant** in the uterus lining and form an **embryo** (ball of cells)

- During **gestation** the developing **fetus** needs nutrients from the mother, these are passed through the **placenta** which is connected to the fetus by the **umbilical cord**
- Nutrients are passed from the mother to the baby and waste products are passed back from the baby to the mother
- The baby is protected from bumps to the mother by the **amniotic sac** which acts as a shock absorber

Key terms

Make sure you can write definitions for these key terms.

adaptation adolescence amniotic sac cervix cilia egg cell embryo ovulation penis period placenta puberty reproductive system environmental variation fertilisation fetus gamete gestation scrotum semen sex hormones species sperm cell sperm duct implantation inherited variation menstrual cycle ovary oviduct testicles umbilical cord urethra uterus vagina variation