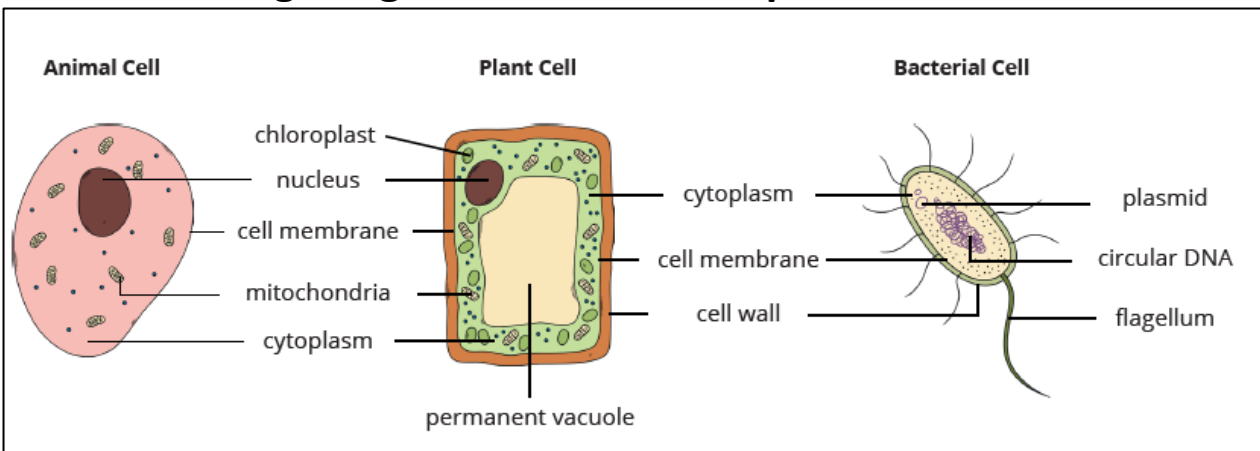
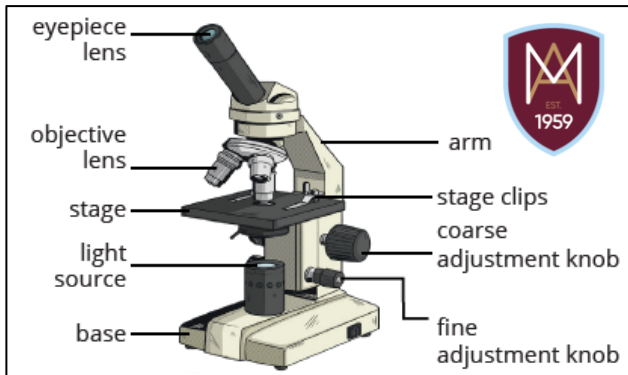


KS3 Knowledge Organiser – Cells & Reproduction



Sub-Cellular Structure	Animal Cell	Plant Cell	Bacterial Cell
nucleus	✓	✓	✗
circular DNA	✗	✗	✓
mitochondria	✓	✓	✗
chloroplasts	✗	✓	✗
cell wall	✗	✓	✓
cell membrane	✓	✓	✓
cytoplasm	✓	✓	✓
flagellum	✗	✗	✓
permanent vacuole	✗	✓	✗
plasmids	✗	✗	✓



Using a Light Microscope

- Plug in the microscope and turn on the light.
- Place the slide on the stage and hold it in place with the stage clips.
- Turn to the objective lens with the lowest magnification.
- Look down the eyepiece lens and use the adjustment knobs to focus the specimen.
- Increase the magnification by turning to a higher power objective lens, then use the fine adjustment knob to bring the cells back into focus.

Subcellular structure	Function
Nucleus	Controls the activities of the cell. It contains DNA
Cytoplasm	Is where most chemical reactions take place
Cell membrane	Controls the movement of substances into and out of the cell
Cell wall	Helps strengthen the cell
Permanent vacuole	Filled with cell sap for structural support
Chloroplasts	Contain chlorophyll which absorbs light for photosynthesis
Mitochondria	Releases energy for the cell via aerobic respiration
Plasmid	Small rings of DNA in a bacterial cell
Flagellum	A tail-like structure for movement



Name	Diagram	Functions	Adaptions
root hair cell		To absorb water and minerals from the soil.	Long protrusion fits between grains of soil and provides a large surface area for the absorption of water and minerals into the cell.
palisade cell		To carry out photosynthesis and make food for the plant.	Lots of chloroplasts to absorb light energy for photosynthesis. Its tall, long shape gives the cell a large surface area to maximise the absorption of light.
sperm cell		To travel to and fuse with an egg cell for fertilisation.	Long tail for movement to the egg and lots of mitochondria to release energy to allow the sperm to move.
egg cell		To be fertilised by the sperm cell.	The cytoplasm contains nutrients for the developing embryo. The membrane changes after fertilisation to stop any more sperm getting in.
red blood cell		To transport oxygen around the body.	Biconcave shape increases the surface area for the diffusion of oxygen. No nucleus so that there is more room for haemoglobin, which binds oxygen molecules.

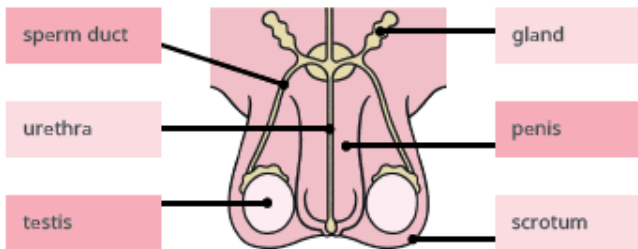
A **cell** is the smallest unit of a living organism. It contains structures needed to carry out life processes.

A **tissue** is a group of cells of the same type.

An **organ** is a group of different tissues working together to carry out a job.

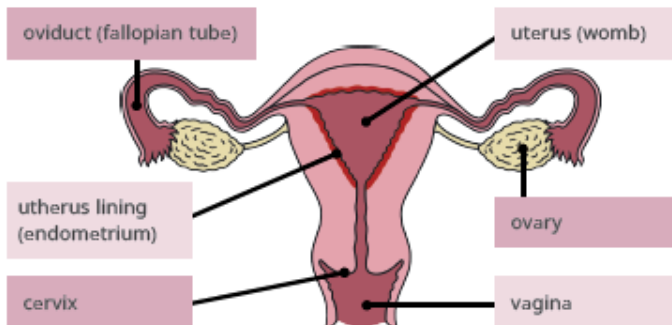
An **organ system** is a group of different organs working together to perform a particular function.

Male Reproductive System



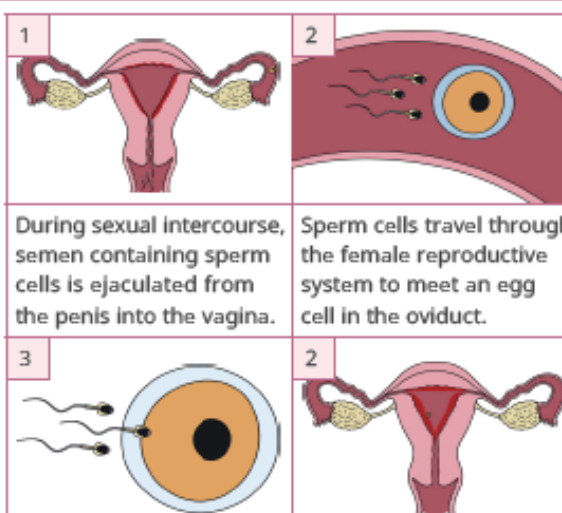
Part	Function
penis	Allows urine and semen to pass out of the male's body.
testis	Produces sperm cells and releases the male sex hormone testosterone.
urethra	A tube that carries urine and semen. It has a ring of muscle to keep these fluids separate.
scrotum	A bag of skin that contains the testes.
gland	Produces fluids that mix with sperm cells to make semen.
sperm duct	Carries sperm cells from the testes to the urethra.

Female Reproductive System



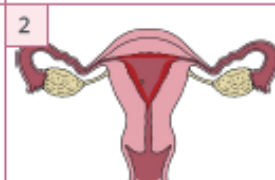
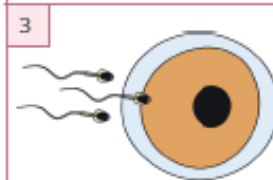
Part	Function
vagina	A muscular tube that leads from the cervix to the outside of the body.
cervix	A ring of muscle at the lower end of the uterus. This keeps the baby in place during pregnancy.
ovary	Contains hundreds of undeveloped egg cells. Every month, an egg cell matures and is released.
uterus	Where the baby develops during pregnancy.
oviduct	Carries egg cells from the ovaries to the uterus.
uterus lining	A blood-rich layer of tissue in which an embryo implants. This tissue is lost each month during menstruation.

Human Reproduction



During sexual intercourse, semen containing sperm cells is ejaculated from the penis into the vagina.

Sperm cells travel through the female reproductive system to meet an egg cell in the oviduct.



One sperm cell penetrates the egg cell membrane. The nucleus of the sperm cell fuses with the nucleus of the egg cell. This is called fertilisation.

The resultant zygote divides several times to form a ball of cells called an embryo, which implants in the uterus lining.

Keywords

Fertilisation	The fusion of an egg and a sperm cell
Zygote	A fertilised egg cell
Foetus	Unborn offspring after the embryo stage
Miscarriage	The death of a foetus before 24 weeks

Development of a baby

The average length of gestation in humans is 40 weeks.

Week	Description
4 - 6	The embryo is about 6mm long. The heart and other organs start to form, and the heart begins to beat.
8 - 9	Arms begin to grow and toes and eyelids begin to form. The embryo is now called a foetus.
12	The foetus is now fully formed and all the organs, muscles and bones are in place. It is now around 60mm long and starts to move around.
20 - 24	The foetus is around 250mm long. It has begun to kick and can hear sounds outside the uterus. It swallows amniotic fluid and produces urine. Fingerprints have now formed.
28	The baby has hair and can open its eyes. There is a high chance that the baby would survive if it was born now.
37 - 40	The baby is fully developed and ready to be born. It is now around 520mm long. It rotates so its head is pointing downwards.

The Menstrual Cycle

The menstrual cycle is a process that occurs in the female reproductive system. The average length of the menstrual cycle is 28 days.

Day	Description
1 - 5	The uterus lining breaks down and passes out of the vagina. This is known as menstruation or 'having a period'.
5 - 14	The uterus lining starts to build up again. An egg cell starts to mature in the ovary.
14	An egg cell is released from the ovary. This is called ovulation.
14 - 28	The uterus lining remains thick. During this time, the egg may be fertilised by a sperm cell.
28	If the egg cell is not fertilised by a sperm cell, the uterus lining begins to break down again and the cycle repeats.



Effect of a maternal lifestyle

Substance (passed to developing foetus via the placenta & umbilical cord)	Effect
Oxygen & glucose	Needed for normal growth and development
Alcohol (ethanol) & smoking (nicotine) during pregnancy	Increases the chance of miscarriage, stillbirth, premature birth or low birthweight and poor brain development

