

Body Systems

TISSUES and ORGANS

Groups of specialised cells are called **TISSUES**

VASCULAR
transports water and dissolved sugar via xylem and phloem cells

BLOOD
connective tissue that transports substances around the body

LUNGS
site of gas exchange to absorb oxygen and get rid of carbon dioxide

BRAIN
processes electrical impulses from sense organs and converts them into appropriate responses

HEART
pumps blood to other body tissues so every cell gets oxygen to respire
 $\text{glucose} + \text{oxygen} \rightarrow \text{carbon dioxide} + \text{water}$

LEAF
cells carry out photosynthesis to produce sugar and release energy
 $\text{carbon dioxide} + \text{water} \rightarrow \text{glucose} + \text{oxygen}$

MUSCLE
contracts to allow movement of body parts

NERVE
allows rapid communication between different parts of the body

ORGANS are formed from different tissues working together

Body Systems

HEART and LUNGS

BLOOD
red blood cells, white blood cells, platelets, plasma

BLOOD VESSELS
vein: blood IN, valves, thin walls, low pressure
artery: OUT/away, no valves, thick walls, high pressure

HEART
4 chambers, pumps blood through the heart twice

capillaries
1 cell thick, networked throughout body

CIRCULATORY system

AIRWAYS
air enters via mouth and nose

LUNGS
trachea, bronchus, bronchiole

alveoli
huge surface area to exchange gases

DIAPHRAGM
sheet of muscle that controls breathing
chest EXPANDS (muscles CONTRACT, air IN) / chest DELATES (muscles RELAX, air OUT)

RESPIRATORY system

Body Systems

DIGESTIVE SYSTEM

TEETH
breaks down food into small chunks

OESOPHAGUS
transports food from the mouth to the stomach

LIVER
makes bile to break down fats

STOMACH
acid kills harmful microbes (germs)

PANCREAS
cuts big molecules into small ones

SMALL INTESTINE
absorbs useful nutrients in molecular form
just a big tube, like me!

LARGE INTESTINE
absorbs water and pushes out waste

ANUS
controls when you excrete

Body Systems

PLANT STRUCTURE

♀ CARPEL
stigma: receives pollen and captures it
style: holds stigma up and prevents pollination by the wrong sort of pollen
ovary: produces ovules which become seeds when pollinated

♂ STAMEN
anther: produces pollen
filament: holds anther up for easy pollination
petal: bright colours attract pollinators
sepal: protects the flower bud before it blooms
peduncle: part of the stem that supports the flower

leaf
produces food and energy via photosynthesis

stem
holds plant up and transports water to the rest of the plant

roots
absorbs water and nutrients

flower
attracts pollinators with colour and scent

Body Systems

SKELETAL SYSTEM

The skeleton provides support and protection

skull
made of many bones that fuse together after birth which protects the brain

vertebrae
protects the spinal cord and allows humans to sit upright

ribcage
protects the heart, lungs and liver

femur
the longest and strongest bone

BONE
a living tissue which is constantly dissolving and being reformed so it can repair itself when it gets broken
red and white blood cells are made in the soft tissue inside larger bones called **BONE MARROW**

adults have **206** bones

Body Systems

BIOMECHANICS

Muscles exert force on bones to move the skeleton at its joints

ANTAGONISTIC MUSCLES
muscles can only pull, not push, so they have to work in pairs

JOINTS
bone: very strong but will wear away if they touch
cartilage: tough but smooth tissue which reduces friction between bones
ligament: strong cord-like tissues that attach to the ends of bones to hold them in the right place
synovial fluid: provides cushioning

HINGE
e.g. knee

PIVOT
e.g. neck

BALL & SOCKET
e.g. hip