

In multicellular organisms, cells are specialised to perform specific functions.

The first group of cells in an embryo are initially identical. As it matures, **each cell takes on its own individual characteristics that suit it to the function that it will perform when its mature.**

Tissue: A collection of similar cells that perform a specific function.

Epithelial Tissues: found in animals and consist of sheets of cells.

They **line the surfaces of organs and often have a protective secretory function.**

Ciliated epithelium lines a duct such as the trachea. **The cilia are used to move mucus over the epithelial surface.**

Those made up of thin, flat cells that line organs where diffusion takes place = **alveoli in the lungs.**

Xylem in plant cells is made up of a number of similar cell types.

Tissues:

Protect: internal organs form damage/ epithelial cells forming the skin are thickened with keratin (protein) = helps cells to resist abrasion.

Diffuse: substances diffuse across the surface of the epithelium.

Absorb materials.

Secrete: substances are secreted onto the surface of the epithelium.

Organ: A combination of tissues that are coordinated to perform a variety of functions, although they often have one predominant major function.

The Stomach: involved in the digestion of food and is made up of tissue such as:

Muscle to churn and mix the stomach contents

Epithelium to protect the stomach wall and produce secretions

Connective tissue to hold together other tissues.

Cell Specialisation

In Plants, an organ is made up of:

Palisade mesophyll made up of leaf palisade cells that carry out photosynthesis.

Spongy mesophyll adapted for gaseous diffusion.

Epidermis to protect the leaf and allow gaseous diffusion.

Phloem to transport organic materials away from leaf.

Xylem to transport water and ions into the leaf.

Arteries and Veins are organs because they are made up of many tissues.

Organ Systems: Organs work together as a single unit known as an organ system.

Digestive System: digests and processes food.

Respiratory System: used for breathing and gaseous exchange.

Circulatory System: pumps and circulates blood.

Excretory System: removes waste from body.

Endocrine System: chemical communications using hormones.

Lymphatic System: defends the body against pathogens.

Muscular System: enables the body to move using muscles.

Nervous System: collects and processes information via nerves and the brain.

Urinary System: where kidneys filter blood.

Reproductive System: sex organs required for producing offspring.

Skeletal System: bones supporting the body and protecting organs.