

Cell Structures

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How is the **magnification** of a light microscope calculated?

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Cell Structures

Total **magnification** is calculated by multiplying the magnification of the eyepiece lens by the magnification of the objective lens.

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What Happens in Cells

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What term is used to describe the shape of a **DNA** molecule?

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What Happens in Cells

A **DNA** molecule forms the shape of a **double helix**.

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Respiration

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What is the word equation for **aerobic respiration**?

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Respiration

glucose + oxygen \longrightarrow
carbon dioxide + water
(+ energy released)

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Photosynthesis

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What are the products of **photosynthesis**?

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Photosynthesis

The products of **photosynthesis** are glucose and oxygen.

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Supplying the Cell

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What is the process by which water molecules move across a partially permeable membrane from a dilute solution to a more concentrated one?

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Supplying the Cell

Osmosis is the movement of water molecules from a dilute to a more concentrated solution across a partially permeable membrane.

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The Challenges of Size

Exchange surfaces allow efficient transport of materials. What are the three main features of an efficient exchange system?

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The Challenges of Size

An efficient exchange system should have: (1) a large surface-area-to-volume ratio; (2) thin membranes so the diffusion distance is short; (3) a good supply of transport medium (e.g. blood, air, etc.).

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The Heart and Blood Cells

What are the three types of blood vessel?

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The Heart and Blood Cells

The three types of blood vessel are **arteries**, **capillaries** and **veins**.

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Plants, Water and Minerals

What is **translocation**?

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Plants, Water and Minerals

Translocation is the movement of glucose from the leaf (where it is produced) to other parts of the plant (where it is needed) via the phloem.

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Coordination and Control

The **nervous system** is composed of two parts. What are they?

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Coordination and Control

The nervous system is composed of the **central nervous system** (the brain and the spinal cord) and the **peripheral nervous system** (all the other nerve cells that connect to the central nervous system).

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The Eye and the Brain

In the eye, what two structures control the shape of the lens, allowing light to be focused?

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The Eye and the Brain

The **ciliary body** and **suspensory ligaments** control the shape of the lens.

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The Endocrine System

Hormones are chemical messengers produced by **glands**. How do they reach their target organ?

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The Endocrine System

Hormones are released directly into the blood, which transports them to their target organ.

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Hormones and Their Uses

What two hormones are combined in most contraceptive pills?

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Hormones and Their Uses

Most contraceptive pills contain oestrogen and progesterone.

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Plant Hormones

What hormone causes **phototropism** in a plant shoot?

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Plant Hormones

Auxin causes **phototropism** in a plant shoot.

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Maintaining Internal Environments

What triggers the **pancreas** to produce **insulin**?

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Maintaining Internal Environments

High blood sugar levels cause the **pancreas** to produce **insulin**.

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Water and the Kidneys

The kidney is made up of many filtering units called **nephrons**. Where in the nephron does **selective reabsorption** take place?

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Water and the Kidneys

Selective reabsorption takes place in the **tubules** of the **nephron**.

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Recycling

Photosynthesis removes carbon dioxide from the atmosphere. What two processes release carbon dioxide to the atmosphere?

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Recycling

Respiration (animal, plant and microbial) and combustion release carbon dioxide to the atmosphere.

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Decomposition and Interdependence

What is the name of the relationship between two organisms where both depend on each other and both benefit?

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Decomposition and Interdependence

Mutualism. In a mutualistic relationship, both organisms depend on each other and both benefit.

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Biomass and Energy Transfers

A pyramid of **biomass** shows that energy is lost at each **trophic level** of a food chain. Why is this?

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Biomass and Energy Transfers

Energy is lost from the food chain as organisms move and respire, produce heat and excrete waste. Some energy may be used to produce inedible body parts, such as shells or feathers.

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Genes

The **allele** for brown eyes is **dominant** to the allele for blue eyes. What will be the **phenotype** of a person who is **heterozygous** for eye colour?

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Genes

The person will have brown eyes.

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Genetics and Reproduction

What type of cell division produces **gametes**?

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Genetics and Reproduction

Meiosis produces **gametes**.

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Natural Selection and Evolution

For evolution to occur, there must be genetic variation in a population. How might genetic variation arise?

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Natural Selection and Evolution

Variation can arise through **mutations** in genes.

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Monitoring and Maintaining the Environment

What piece of equipment is used to sample the number of plant species in a field?

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Monitoring and Maintaining the Environment

A quadrat is used to sample the number of plant species in a field.

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Investigations

In an investigation, how would you make sure your measurements are **reliable** and identify any that might be **anomalous**?

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Investigations

All measurements should be repeated. If a single reading is very different to the others (**anomalous**), this might indicate that an error has been made in measuring.

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Feeding the Human Race

What is food security?

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Feeding the Human Race

Food security is ensuring that all people have access to sufficient, safe and nutritious food.

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Monitoring and Maintaining Health

What are the four main human defences to stop microorganisms entering the body?

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Monitoring and Maintaining Health

Microorganisms are prevented from entering the body by the skin (a physical barrier), platelets that help the blood to clot and seal wounds, mucous in the lungs that traps microorganisms and acid in the stomach that destroys microorganisms.

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Why wouldn't you use **antibiotics** to treat a cold caused by a virus?

26

Antibiotics are used for bacterial infections. They have no effect on viruses, which are found inside the cell.

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What three options can be used to treat **cardiovascular disease**?

27

Cardiovascular disease can be treated with lifestyle changes (healthy eating and exercise, stopping smoking), surgery (heart transplants or **stents**) and medications (**statins** or aspirin).

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