

Mitosis and cancer

What is the order of the stages of the cell cycle?

Mitosis and cancer

What happens in interphase?

Mitosis and cancer

What happens in prophase?

Mitosis and cancer

What happens in metaphase?

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What happens in anaphase?

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What happens in telophase?

Mitosis and cancer

What is cytokinesis?

Mitosis and cancer

What does mitosis produce?

The cell grows and the DNA is copied.

Interphase, prophase, metaphase, anaphase, telophase, then cytokinesis.

The chromosomes line up along the middle (equator) of the cell.

The chromosomes become visible and the nuclear membrane breaks down.

A new nuclear membrane forms around each set of chromosomes.

The two copies of each chromosome are pulled apart to opposite ends of the cell.

Two daughter cells, each with an identical set of chromosomes to the parent cell, so they are genetically identical.

The division of the cytoplasm and cell membrane to form two separate cells.

Mitosis and cancer

What does diploid mean?

Mitosis and cancer

Give three uses of mitosis.

Mitosis and cancer

Why are the offspring of asexual reproduction identical to the parent?

Mitosis and cancer

What is cancer?

Mitosis and cancer

What is a tumour?

Growth, differentiation and stem cells

Which processes are involved in growth in animals?

Growth, differentiation and stem cells

Which processes are involved in growth in plants?

Growth, differentiation and stem cells

What is elongation in plants?

Growth, repair and asexual reproduction.

The nucleus contains two sets of chromosomes, which form pairs. Human body cells have 46 (23 pairs).

The result of changes in cells that lead to uncontrolled cell division.

They are made by mitosis, which produces genetically identical cells, from only one parent.

Cell division and differentiation.

A mass of cells formed when cells divide in an uncontrolled way.

Cells getting longer, mostly by taking in water so that they expand.

Cell division, elongation and differentiation.

Growth, differentiation and stem cells

What is differentiation?

Growth, differentiation and stem cells

Why is differentiation important?

Growth, differentiation and stem cells

What is a percentile chart used for?

Growth, differentiation and stem cells

A child is on the 75th percentile for mass. What does this mean?

Growth, differentiation and stem cells

What is the equation for percentage change?

Growth, differentiation and stem cells

What is a stem cell?

Growth, differentiation and stem cells

What is the function of embryonic stem cells?

Growth, differentiation and stem cells

What is the function of stem cells in adult animals, such as in bone marrow?

It produces specialised cells, so a multicellular organism can have different cells doing different jobs.

The process by which a cell becomes specialised for a particular job by gaining the structures it needs.

75% of children of that age and sex have a lower mass, and 25% have a higher mass.

To monitor the growth of a child by comparing their measurements with those of other children of the same age and sex.

An undifferentiated cell that can divide and can differentiate into specialised cells.

$(\text{change} \div \text{original value}) \times 100$

They replace damaged or worn-out cells.
They can differentiate into only a limited range of cell types, for example blood cells.

They can differentiate into any type of cell, producing all the specialised cells of the developing embryo.

Growth, differentiation and stem cells

What is the function of meristems in plants?

Growth, differentiation and stem cells

Give two potential benefits of using stem cells in medicine.

Growth, differentiation and stem cells

Give two risks of using stem cells in medicine.

Growth, differentiation and stem cells

Why do some people object to embryonic stem cell research?

Neurones and reflexes

What is a sensory receptor?

Neurones and reflexes

What does a sensory neurone do?

Neurones and reflexes

What does a relay neurone do?

Neurones and reflexes

What does a motor neurone do?

Treating conditions such as diabetes or paralysis, and replacing damaged cells with healthy ones.

Found at root and shoot tips, they produce cells that can differentiate into any type of plant cell, so the plant keeps growing.

Embryos are used, and some people have ethical or religious objections to this.

Tumour formation, and transfer of viruses from donor cells. Also immune rejection.

Carries electrical impulses from a receptor to the CNS.

A cell that detects a stimulus and produces an electrical impulse.

Carries electrical impulses from the CNS to an effector.

It is in the CNS and connects the sensory neurone to the motor neurone.

Neurones and reflexes

What is the CNS?

Neurones and reflexes

What are the axon and the dendron?

Neurones and reflexes

What is the role of the myelin sheath?

Neurones and reflexes

What is a synapse?

Neurones and reflexes

What is the role of a neurotransmitter?

Neurones and reflexes

What is the pathway of a reflex arc?

Neurones and reflexes

Why are reflex actions important?

Neurones and reflexes

In the ruler-drop test, what does a shorter distance show?

The axon carries impulses away from the cell body. The dendron carries impulses towards the cell body.

The central nervous system: the brain and spinal cord.

A gap between two neurones.

It insulates the neurone and speeds up the transmission of impulses.

Stimulus, receptor, sensory neurone, relay neurone, motor neurone, effector, response.

It diffuses across the synapse and binds to receptors on the next neurone, triggering a new impulse.

A faster reaction time.

They are fast and automatic and do not need conscious thought, so they protect the body from harm.

The brain **Triple only**

What do the cerebral hemispheres do?

The brain **Triple only**

What does the cerebellum do?

The brain **Triple only**

What does the medulla oblongata do?

The brain **Triple only** **Higher tier**

How does a CT scan help investigate the brain?

The brain **Triple only** **Higher tier**

How does a PET scan help investigate the brain?

The brain **Triple only** **Higher tier**

Why are spinal injuries difficult to treat?

The brain **Triple only** **Higher tier**

Why are brain tumours difficult to treat?

The eye **Triple only**

What do the cornea and lens do?

Coordinates movement and helps to control balance.

They are involved in consciousness, intelligence, memory and language.

X-rays from many angles build images of the brain's structure, without surgery. It can show damage or tumours.

Controls unconscious activities, such as heart rate and breathing rate.

Neurones in the spinal cord do not easily repair, so impulses cannot pass the damaged region and paralysis can be permanent.

A radioactive tracer shows which areas of the brain are active, so it shows brain function, without surgery.

They refract (bend) light. The cornea bends light entering the eye and the lens focuses it on the retina.

They may be hard to reach, and treatment can damage healthy brain tissue around them.

The eye **Triple only**

What does the iris do?

The eye **Triple only**

What do rod cells do?

The eye **Triple only**

What do cone cells do?

The eye **Triple only**

What is a cataract?

The eye **Triple only**

What is long-sightedness?

The eye **Triple only**

What is short-sightedness?

The eye **Triple only**

What causes colour blindness?

The eye **Triple only**

How is long-sightedness corrected?

Detect dim light. They do not detect colour.

Controls how much light enters the eye by changing the size of the pupil.

The lens becomes cloudy, so less light reaches the retina and vision is blurred.

Detect colour and work in bright light.

Distant objects look blurred because light is focused in front of the retina.

Near objects look blurred because light is focused behind the retina.

With a convex lens, which bends light inwards so it focuses on the retina.

One or more types of cone cell are missing or not working properly.

The eye **Triple only**

How is short-sightedness corrected?

The eye **Triple only**

How are cataracts corrected?

The eye **Triple only**

**How can laser eye surgery correct
long- or short-sightedness?**

Surgery removes the cloudy lens and replaces it with an artificial lens.

With a concave lens, which spreads light out so it focuses on the retina.

It changes the shape of the cornea, so light is focused on the retina.