

# AQA Biology GCSE

## 1.2 - Cell Division

### Flashcards

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# What are chromosomes made up of?



# What are chromosomes made up of?

Chromosomes consist of DNA molecules combined with proteins. They contain genes which provide the instructions for protein synthesis.



# What is a gene?



# What is a gene?

A section of DNA which codes for a protein.



How many chromosomes are found in the nucleus of human body cells?



How many chromosomes are found in the nucleus of human body cells?

46



How many chromosomes are found in the nucleus of gametes?





How many chromosomes are found in the nucleus of gametes?

23



How are chromosomes arranged in the nucleus of a body cell?



How are chromosomes arranged in the nucleus of a body cell?

Arranged in pairs - 46 chromosomes form 23 pairs.



What are the three main stages of the cell cycle?



# What are the three main stages of the cell cycle?

1. Replication of DNA and synthesis of organelles
2. Mitosis
3. Division of cell



# Why is mitosis important?



# Why is mitosis important?

- Produces identical cells which all have the same genetic information.
- Produces additional cells for growth and repair.



# Describe the first stage of the cell cycle





# Describe the first stage of the cell cycle

Longest stage - cells grow and increase in mass, replicate DNA and synthesise more organelles (eg. mitochondria, ribosomes).



# Describe the second stage of the cell cycle



# Describe the second stage of the cell cycle

Each chromosome in a pair is pulled to opposite poles of the cell, then the nucleus divides.



# Describe the third stage of the cell cycle



# Describe the third stage of the cell cycle

The cytoplasm and cell membrane divide - two identical daughter cells are produced.



# What is a stem cell?



# What is a stem cell?

An unspecialised cell which is capable of differentiating into other cell types and of self-renewal.



What is the function of stem cells in embryos?





# What is the function of stem cells in embryos?

Embryonic stem cells can replicate themselves and differentiate into many other types of cells.

Embryonic stem cells may be able to treat conditions such as paralysis and diabetes by dividing to replace damaged cells.



What is the function of stem cells in adult bone marrow?



## What is the function of stem cells in adult bone marrow?

Adult stem cells can differentiate into several cell types to replace dead or damaged tissues. For example, bone marrow stem cells can form many different types of blood cell.



What is the function of stem cells in plant meristems?



# What is the function of stem cells in plant meristems?

Meristem stem cells retain the ability to differentiate into any type of plant cell throughout their lifespan - they can differentiate into any cell which is required by the plant.



# What is therapeutic cloning?



# What is therapeutic cloning?

A cloning method where an embryo is produced with the same genetic makeup as the patient.

The stem cells which originate from the embryo will not be rejected by the patient's immune system, so can be used to treat certain medical conditions.



What are the advantages of cloning plants using meristem stem cells?





## What are the advantages of cloning plants using meristem stem cells?

- Can prevent rare plants from becoming extinct.
- Can produce large numbers of plants with a favourable characteristic.
- Can produce identical plants for research.



What are issues associated with the use of embryonic stem cells?



# What are issues associated with the use of stem cells?

- Many embryonic stem cells are sourced from aborted embryos - some people have an ethical/religious objection.
- Development of stem cell therapies is slow, expensive and difficult.
- Adult stem cells infected with viruses could transfer infections to patients.
- If donor stem cells do not have a similar genetic makeup to the patient, an immune response could be triggered.

