1.2.2 Mitosis and the cell cycle

AQA GCSE Biology (Higher)
Question and answer notes

For more resources, visit www.mooramo.com

How to use these notes

These notes cover everything you need to know for this part of the specification. They have been written in question-answer format to make them easier for you to study from.

In order to study successfully, I recommend you do the following for each question and answer:

- Read it carefully and make sure you **understand** it.
- **Memorise** the answer.
- **Practice** applying your understanding to past exam questions.

A good way to memorise information is to use **retrieval practice**. This is when you practise retrieving information from your memory. You could do this by making a flashcard for each question with the question on one side and the answer on the other. Or you could use a flashcard app. Alternatively, use a sheet of paper to cover up the answer so you can only see the question. Try to answer the question and then check how you did.

You should practise retrieving each answer from your memory until you can do it perfectly. Even once you can retrieve the answer perfectly, your ability to retrieve it will probably fade as time passes without practising. Therefore you will need to keep going back to the questions that you have previously mastered and practising them again. However, each time you re-learn the answer, the memory will be stronger and will last longer than the time before.

What is cell division?
Cell division is when one cell divides to form two cells. It is the process by which new cells are made.

What things usually happen before a cell divides?
Before a cell divides, the following things usually happen:

- The cell grows
- Sub-cellular structures are copied
- The DNA is copied

What is the cell cycle?
The cell cycle is a repeating set of processes in which cells grow, replicate their sub-cellular structures and DNA, and then divide. Each of the cells produced by this division can then begin the cell cycle again.

What is cell division used for in eukaryotes?
In unicellular eukaryotes, cell division is used for reproduction.
In multicellular eukaryotes, it is used for reproduction, growth and development, and the maintenance and repair of tissues.
Some animals stop growing when they reach a certain life stage (maturity). Once these animals reach maturity, cell division is mainly used for maintenance and repair of tissues.

What are the two different types of cell division in eukaryotes?
The two different types of cell division in eukaryotes are:

- Cell division involving mitosis
- Cell division involving meiosis

For cell division involving mitosis, what are the three phases of the cell cycle?
For cell division involving mitosis, the three phases of the cell cycle are interphase, mitosis and cytokinesis (in that order).

What happens during interphase?
During interphase:

- The cell grows
- Sub-cellular structures such as ribosomes and mitochondria are replicated
- The DNA is replicated

In a eukaryotic cell, what are the chromosomes like before and after DNA replication?
In a eukaryotic cell:

- Before DNA replication, each chromosome is a single DNA molecule.
- After DNA replication, each chromosome is made of two identical DNA molecules joined together.

What happens during mitosis?
During mitosis:

- The two DNA molecules in each chromosome are pulled apart, making them separate chromosomes.
- These chromosomes are then pulled to opposite sides of the nucleus.
- The nucleus then divides in two.

What happens in cytokinesis?

In cytokinesis, the cell splits in two.

The cell membrane splits to form two cells. Each one receives one nucleus and a portion of the cytoplasm.

If the cell division involved mitosis then the two cells are genetically identical to the original cell and two each other.