## **Revision Notes 1.6**

#### The role of mitosis

Mitosis is division of the nucleus into two genetically identical daughter nuclei

- The Nucleus of eukaryotic cells can divide into 2 genetically identical daughter cells by mitosis.
- Before it occurs, DNA is replicated in Interphase.
- Mitosis happens when cells with genetically identical nuclei are required in eukaryotes, such as: embryonic development, growth, tissue repair, and asexual reproduction.
- There are 4 phases to it: prophase, metaphase, anaphase, and telophase.

### Interphase

- Interphase is the first part of the cell cycle.
- Interphase consists of 3 phases: G1, S, and G2.
- In the G1 phase cellular contents apart from the chromosomes are duplicated.
- In the S phase the chromosomes are replicated.

### Supercoiling of chromosomes

- In mitosis, the 2 chromatids that make up a chromosome separate and move to opposite cells.
- Because the DNA molecules are very long, they have to be condensed and the DNA coils to become shorter and wider.
- It does it so many times that it's called **supercoiling** and it's helped by the protein **histone**.

### Phases of mitosis

### Prophase

- it gord successively, supercoiling. Chromosomes become shorter and fatter by c
- Nucleolus breaks down.
- spindle-shape Microtubules grow from MTQC at links the poles of the cell.
- Nuclear membrane ar

# Metaphase

- Microtubules continue to grow and attach to the centrosomes in each chromosome.
- The 2 chromatids of each chromosome attach to microtubules on opposite poles.
- The microtubules shorten and the attachment is put under tension to test if it's done correctly.
- The chromosome remain on the equator of the cell.

#### Anaphase

- Each centromere divides, allowing the chromatids to separate from each other.
- The microtubules on each pole pull them rapidly towards them.
- Mitosis produces 2 genetically identical nuclei because sister chromatids are pulled to opposite poles.

## Telophase

- Chromatids reach the poles and are now called chromosomes.
- They are pulled in a tight group near the MTOC and a nuclear membrane forms around them.
- Chromosomes uncoil and a nucleus is formed.
- By now the cell is already dividing.

## Cytokinesis

It occurs after mitosis and is different in plant and animals

This is when the 2 cells finally divide.