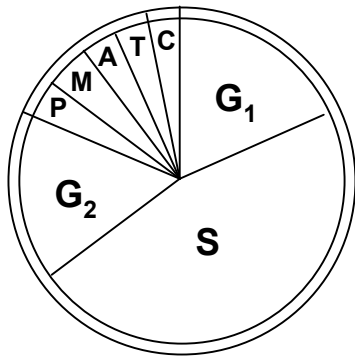


# Cell Division (2.5)

## Outline stages in the cell cycle (2.5.1)



### Interphase

- $G_1$  (before DNA replication: cell growth & organelle duplication)
- S (DNA replication)
- $G_2$  (after DNA replication: final growth & DNA 'proof-reading')

### Mitosis

- Nuclear division (prophase, metaphase, anaphase, telophase)

### Cytokinesis

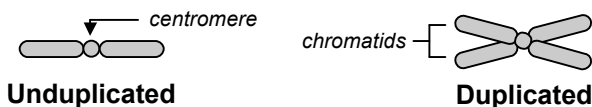
- Cytoplasmic division (cell creates an actin furrow and divides)

## Functions of interphase (2.5.3)

Remember: **PAID**

- P**rotein synthesis (transcription/translation)
- A**erobic respiration (ATP formation)
- I**ncrease organelles (mitochondria/chloroplast)
- D**NA replication (in S phase)

## Structure of a chromosome



## Explain genetic duplication (2.5.5)

Remember: Mitosis = genetically identical

- In S phase, DNA is copied so that chromosomes are made of identical sister chromatids
- Conservation of base sequence is achieved by complementary base pairing
- In anaphase, identical sister chromatids split apart (becoming separate chromosomes)
- In telophase, nuclei reform around separated chromosomes, resulting in the formation of genetically identical nuclei

## Describe the events that occur in the four phases of mitosis (2.5.4)

### 1. Prophase

- DNA supercoils (chromatin → chromosome)
- Nuclear membrane dissolves
- Centrosomes move to opposite poles
- Centrioles start making spindle fibres

### 2. Metaphase

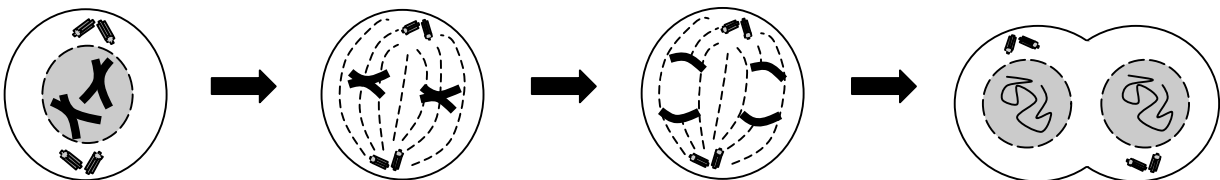
- Spindle fibres connect to centromere
- Chromosomes line up along equator

### 3. Anaphase

- Spindle fibres contract
- Sister chromatid chromosomes split into genetically identical single chromatid chromosomes
- Chromosomes move to opposite poles

### 4. Telophase

- DNA decondenses (chromosome → chromatin)
- Nuclear membranes reform around chromatin



## State the roles of mitosis (2.5.6)

Remember: **GATE**

- G**rowth
- A**sexual reproduction
- T**issue repair
- E**mbryonic development

## Define cancer (2.5.2)

- **Uncontrolled cell division**
- Can occur in any organ or tissue
- Cancer is the disease, tumors are the resulting growths