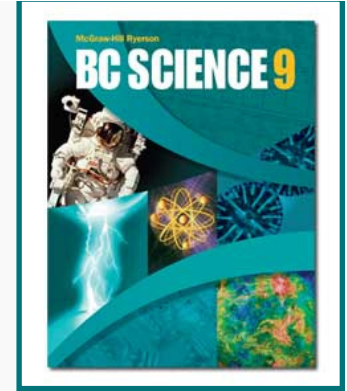


**These notes are posted on my site for the following reasons:**

- **for students to copy in their own hand-writing**
  - **in order to complete their class notes**
  - **if student did not have enough time in class**
  - **if student was away and missed this section**
- **for assistants and tutors to follow progress of the concepts taught**

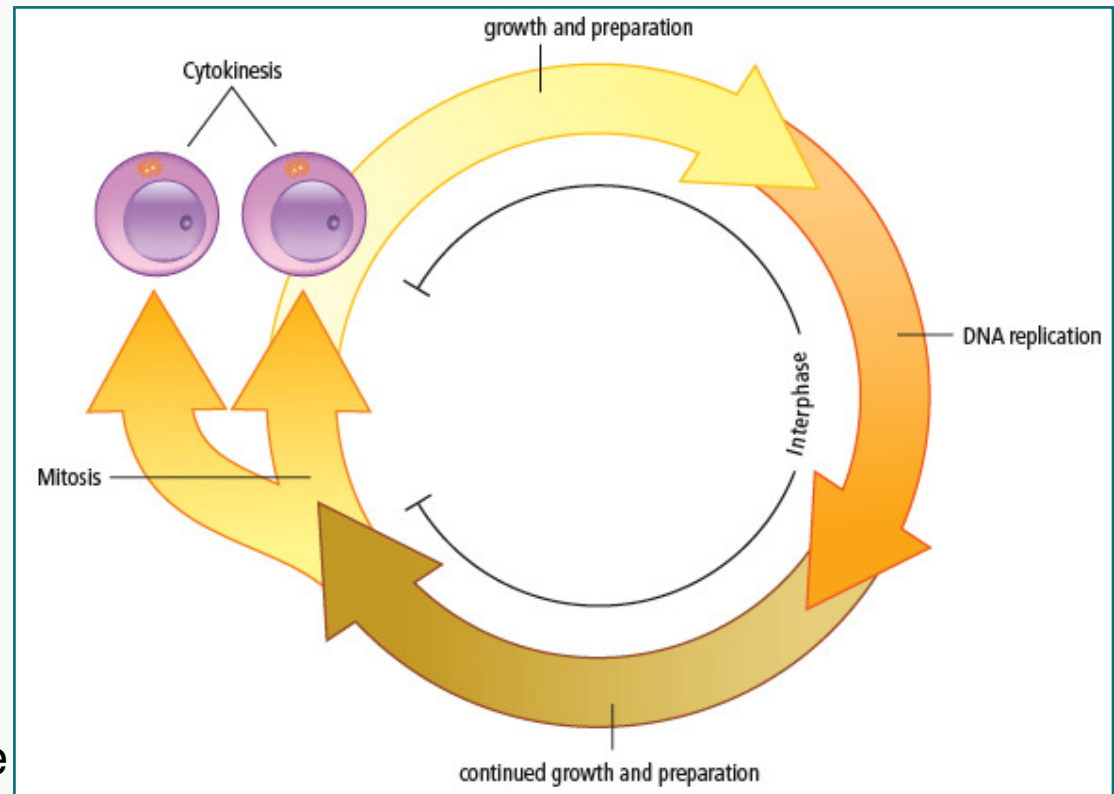
**Photocopied/printed notes can not be used during the Unit Notebook Check in class.**

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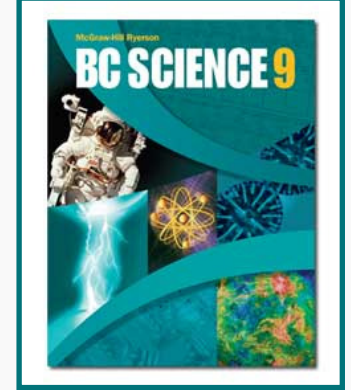
# 5.1 The Cell Cycle and Mitosis

- Due to the loss and death of cells, the body must replace them. A good example of this is human skin cells - each day millions are shed.
- The life of a cell is divided into three stages known as the cell cycle:
- Interphase: cell carries out normal functions.
- Mitosis: nucleus contents duplicated and divide into two equal parts.
- Cytokinesis: separation of two nuclei and cell contents into two daughter cells.
- Copy & caption Fig 5.4 page



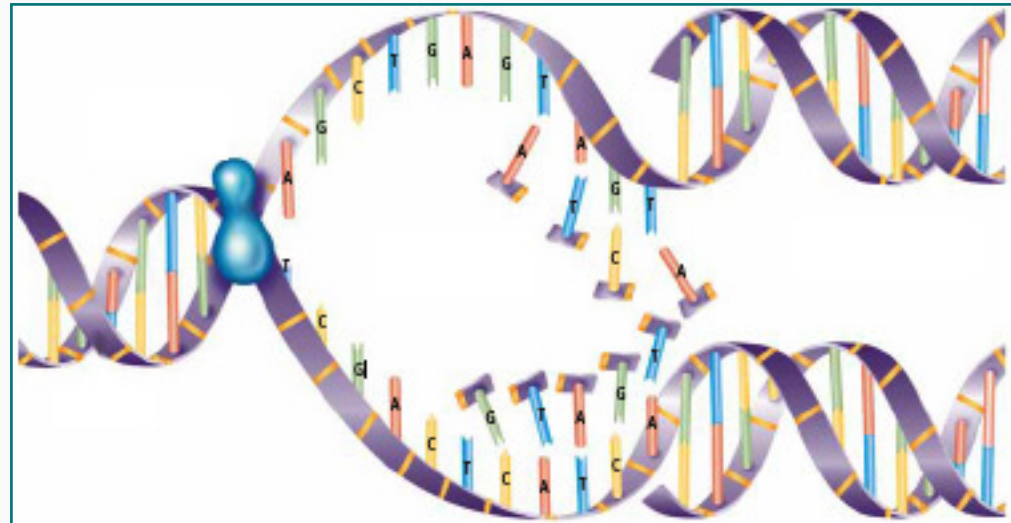
See pages 150 - 153

# Parts of the Cell Cycle



- Interphase, the longest cell cycle stage, is when a cell performs normal functions and grows.
- In late interphase, DNA copies itself in the process of replication. Replication involves several steps:
  1. The DNA molecule unwinds with the help of an enzyme.
  2. New bases pair with the bases on the original DNA.
  3. Two new identical DNA molecules are produced.

[Draw & caption a section of Fig 5.5 page 154]



see pages 153 - 154

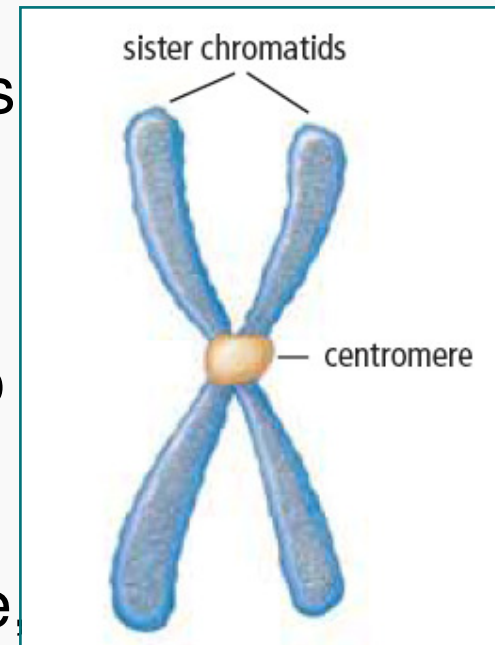
# Mitosis

- At the end of interphase, the cell continues to grow and make proteins in preparation for mitosis and cytokinesis.

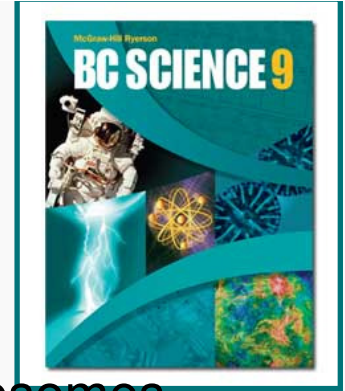


## Mitosis

- Mitosis is the shortest stage of the cell cycle where the nuclear contents divide, and two daughter nuclei are formed.
- As the nucleus prepares to divide, replicated DNA in interphase joins to form sister chromatids, joined by a centromere
- Mitosis occurs in 4 stages: Prophase, Metaphase, Anaphase and Telophase.



See pages 155 - 156



# Stages of Mitosis

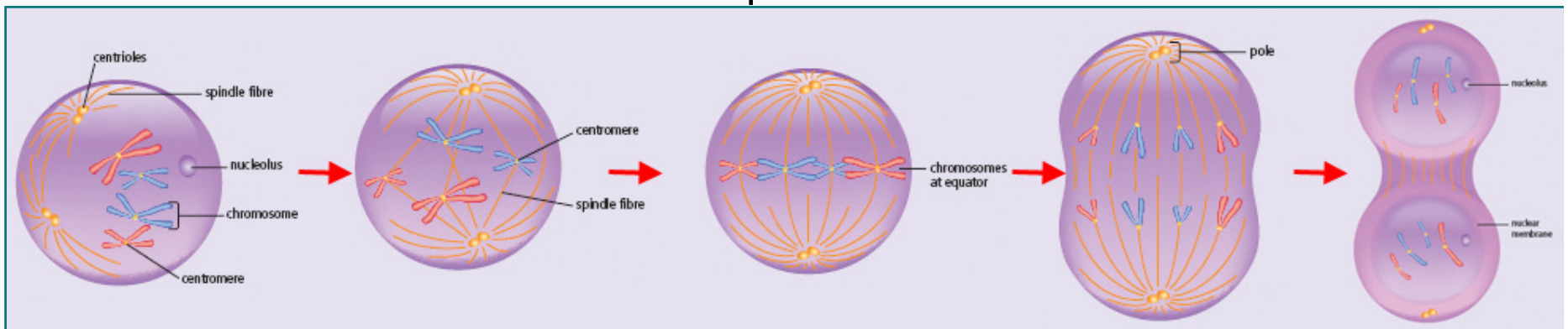
Early Prophase - nucleolus disappears and spindle fibres form

Late Prophase - spindle fibres attach to centromeres of chromosomes

Metaphase - chromosomes align on equator of cell

Anaphase - spindle fibres pull sister chromatids to opposite poles of cell

Telophase - in this final stage, spindle fibres disappear and a nuclear membrane forms around each separated set of chromosomes.

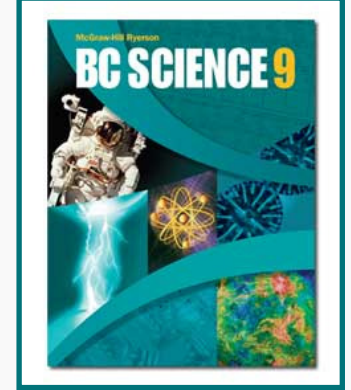


[Copy and caption figure 5.8 page 156&157.]

Cytokinesis is the separation of the nuclei into two daughter cells

See pages 156 - 157

# Cell Cycle Problems



Checkpoints in the cell cycle will prevent division if:

- If the cell is short of nutrients
- If the DNA within the nucleus has not been replicated
- If the DNA is damaged

Mutations in genes involving checkpoints can result in an out-of-control cell cycle. The result can be uncontrolled cell division: cancer.

- Cancer cells have large, abnormal nuclei
- Cancer cells are not specialized, so they serve no function
- Cancer cells attract blood vessels and grow into tumours.
- Cells from tumours can break away to other areas of the body

**[Take the Section 5.1 Quiz](#)**

See pages 159 - 161