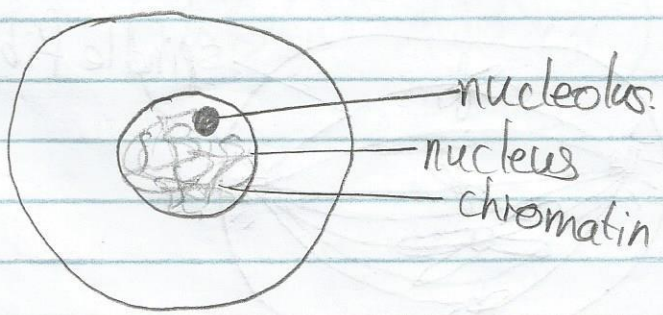
- Prophase
- Metaphase
- Anaphase
- Telophase.

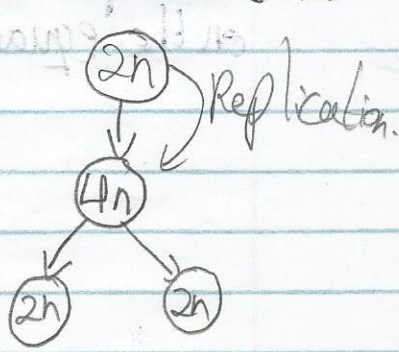
Interphase.

This is the phase during which the cell carries out synthesis of organelles and increases in size. The nucleoli are prominent and actively synthesising ribosomal material. Just prior to cell division the DNA and histone of each chromosome replicates. Each chromosome now exists as a pair of chromatids joined by a centromere.

Interphase is a period of intense chemical activity and it is divided into three parts:

- First growth phase (G_1) – Duplication of all organelles.
- Synthesis phase (S) – DNA replicates.
- Second growth phase (G_2) – Proteins are synthesised, which are required for cell and nuclear division (G_2).





Cancer

Cancer is the result of the ill-regulated proliferation of cells, typically resulting in the formation of a solid tumour.

Usually, it is the result of damage to the genes that regulate mitosis and the cell cycle, which leads to unrestrained growth of cells. As a consequence, a group of abnormal cells, called a tumour, develops and constantly expands in size.

Signs and Symptoms of Cancer

(i) Unexpected lumps in body parts.
(ii) Excessive tiredness
(iii) Extreme pain
(iv) Weight loss.
(v) Hair loss.

Cell division is controlled by genes. Most cells divide at a fairly constant rate to ensure that dead or worn out cells are replaced. In normal cells, this rate is tightly controlled by 2 genes:

- Proto-oncogenes that stimulates cell division.
- tumour suppressor genes that slow cell division.

Role of Proto-oncogenes

Proto-oncogenes stimulate cell division. In a normal cell, growth factors attach to a receptor protein on the cell surface membrane and, via relay proteins in the cytoplasm, 'switch on' the genes necessary for DNA replication. A gene mutation can cause proto-oncogenes to mutate into oncogenes. These oncogenes can affect cell division in 2 ways:

- The receptor protein on the cell surface membrane can be permanently activated, so that cell division is switched on even in the absence of growth factors.
- The oncogene may code for a growth factor that is then produced in excessive amounts, again stimulating excessive cell division.

Normal cell receiving signals from growth factors that will tell it when to divide.