Raffles Institution Raffles Programme
Year Four Biology

Name: _____ ( ) Class: _____ Date: _____

Unit 8: Cell Division
Similarities & Differences

(A) SIMILARITIES

The main similarities between mitosis and meiosis involve the **mechanisms** by which the chromosomes and other cell organelles **replicate** and are **maneuvered within the cell** prior to and during cell division.
The mechanisms of the **processes of nuclear and cytoplasmic division** in mitosis and meiosis are also similar.

(B) DIFFERENCES

Differences between mitosis and meiosis I

	MITOSIS	MEIOSIS I
Prophase	• Homologous chromosomes **remain separate** • **No formation of chiasmata** • **No crossing over**	• **Homologous chromosomes pair up** • **CHIASMATA** form • **CROSSING OVER** may occur
Metaphase	• Pairs of **CHROMATIDS** line up on the equator of the spindle	• Pairs of **CHROMOSOMES** line up on the equator of the spindle
Anaphase	• **CENTROMERES** divide • **CHROMATIDS** separate • Separating chromatids are **genetically identical**	• **Centromeres** do not divide • **CHROMOSOMES** separate. The chromosomes that separate consist of two chromatids. • Separating chromosomes and their chromatids **may not be genetically identical** due to crossing over
Telophase	• **SAME NUMBER** of chromosomes present in daughter cells as parent cells • **Both homologous chromosomes present** in daughter cells if diploid	• **HALF THE NUMBER** of chromosomes present in daughter cells • **Only one of each pair of homologous chromosomes** present in daughter cells
Occurrence	• May occur in haploid, diploid or polyploid cells • Occurs during the formation of **somatic cells** and some spores. Also occurs during the formation of gametes in plants	• Only occurs in diploid or polyploid cells • Occurs during **FORMATION OF GAMETES** or spores