LIFE SCIENCE 11
MEIOSIS

Learning Outcomes:

- **I can describe the process of meiosis.**
- **I can explain why meiosis is used by living organisms.**

Meiosis is used for:

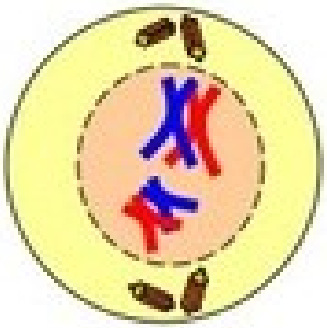
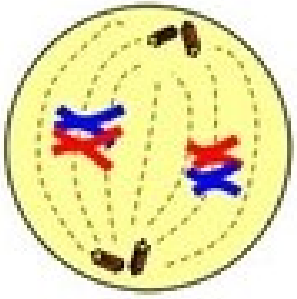
- formation of sex cells or gametes

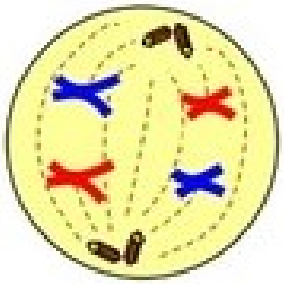
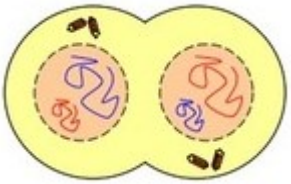
Human cells contain **23** pairs of chromosomes – half from each parent. The paired chromosomes are **similar** to each other – they contain version of the same **genes** (called **alleles**). These paired chromosomes are called **homologous chromosome pairs**.

Haploid cells contain **half** of the genetic material. Examples of haploid cells are **sperm** and **egg** cells. The end result of meiosis is the formation of **4** haploid cells that are genetically **similar**, but **different** from each other.

Meiosis involves 2 rounds of cell division.

Meiosis I

Prophase 1 • Chromosomes condense and link to the duplicate copy → homologous chromosome pairs (4 chromatids or tetrad) • Crossing over can occur → parts of each homologous chromosome pair can swap location • The only homologous set of chromosomes that cannot crossover gene sequences are an XY pairing	
Metaphase 1 • Homologous chromosome pairs line up at equator of cell • 23 homologous pairs or tetrads lined up	

Anaphase 1 • One chromosome from each pair is pulled to opposite ends – random sorting	
Telophase 1 • Nuclear membrane reforms and chromosomes relax	
Cytokinesis • Division of cell into 2 genetically similar but different cells	

Meiosis II

Prophase 2 to Telophase 2 • No chromosome replication • Chromosome separation like mitosis • Ends with 4 genetically different daughter cells