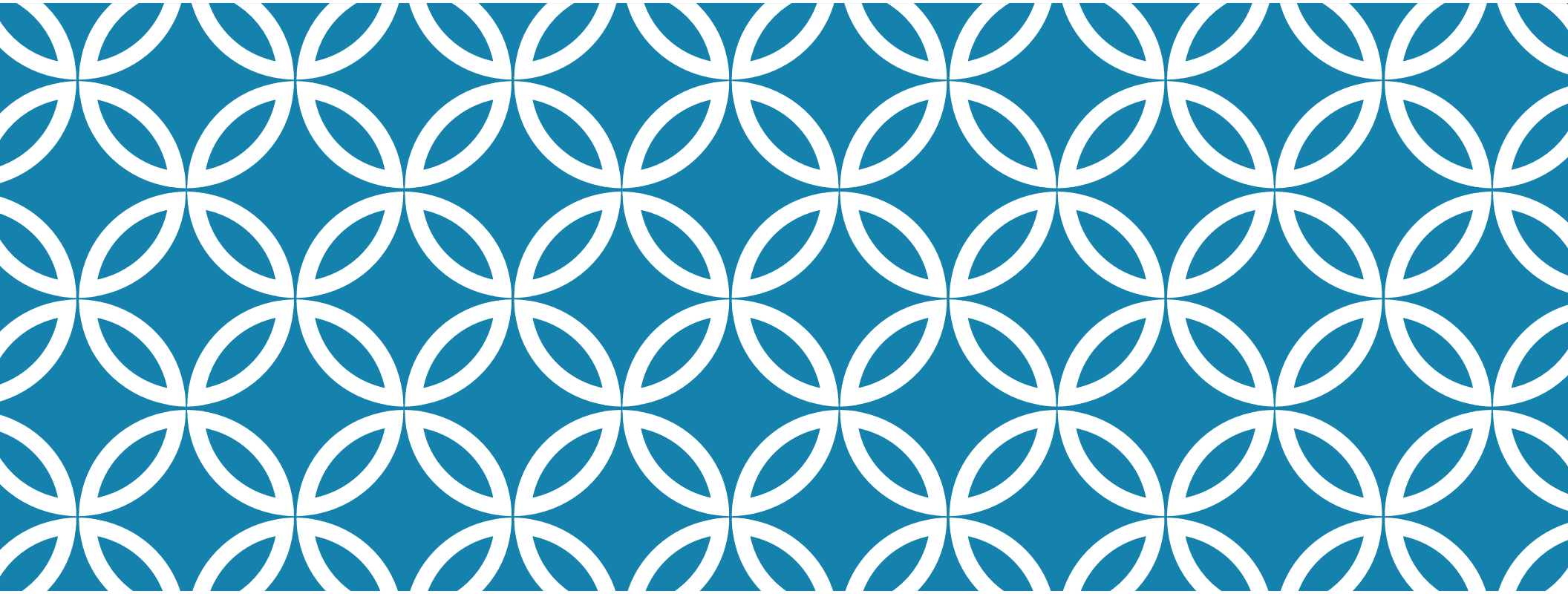


BIOLOGY V

1. Meiosis
2. Stages of Meiosis

VIDEO

https://www.youtube.com/watch?v=VzDMG7ke69g&ab_channel=AmoebaSisters

REVIEW

In sexual reproduction, two cells called gametes combine together to form a zygote which will develop into an offspring. The male contributes one gamete called the sperm cell and the female contributes one gamete called the egg cell or ovum.

Gametes are considered haploid cells because they contain half the normal number of chromosomes an organism has. Regular body cells are diploid as they have the full number of chromosomes.

MEIOSIS

Cells that produce gametes undergo a type of cell division called *meiosis*.

WHAT IS MEIOSIS?

Meiosis is a process that occurs when a diploid cell divides twice to produce four haploid cells.

This happens during sexual reproduction. Offspring are genetically different from parents and from one another (gametes from parents are not genetically the same).

- During meiosis, the sister chromatids (the two halves of a duplicated chromosome) needs to separate as well as the homologous chromosomes (the similar but non-identical chromosome pairs an organism receives from its two parents)

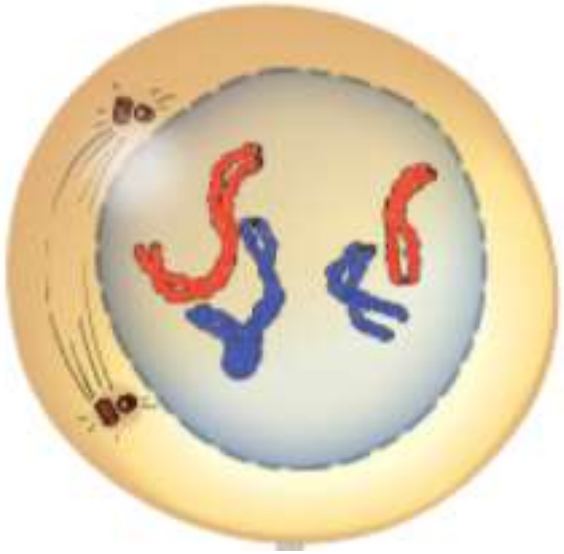
MEIOSIS

Before a cell begins meiosis, the cell must undergo interphase.

- The cell grows and duplicates all of its chromosomes
- It is preparing itself for division

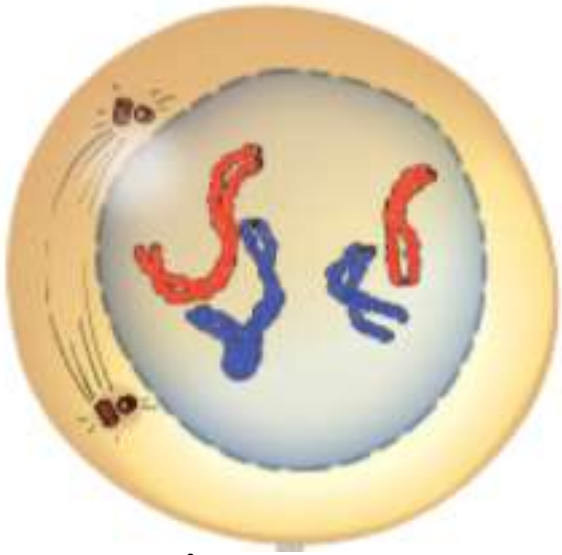
Once interphase is complete, meiosis can begin. Meiosis is split into two parts: Meiosis I and Meiosis II

MEIOSIS I: PROPHASE I

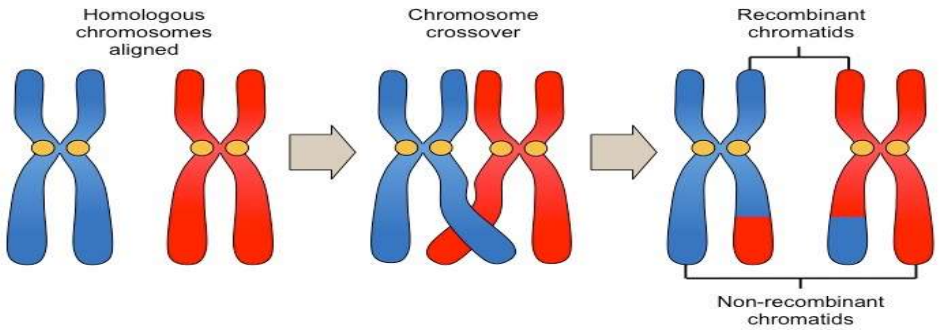


- Nuclear membrane begins to disappear
- DNA condenses into duplicated chromosomes
- Homologous chromosomes are paired
  - Homologous chromosomes are two pieces of DNA which carry the same genes, one from each parental source.
- Spindle fibers begin to form

MEIOSIS I: PROPHASE I

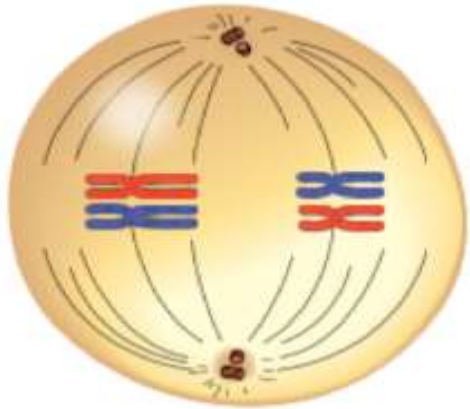


- A process called crossing over may occur the homologous chromosomes.
  - Crossing over occurs when two homologous chromosomes pair up with each other and exchange different parts of their genetic material. This can lead to diversity in offspring.



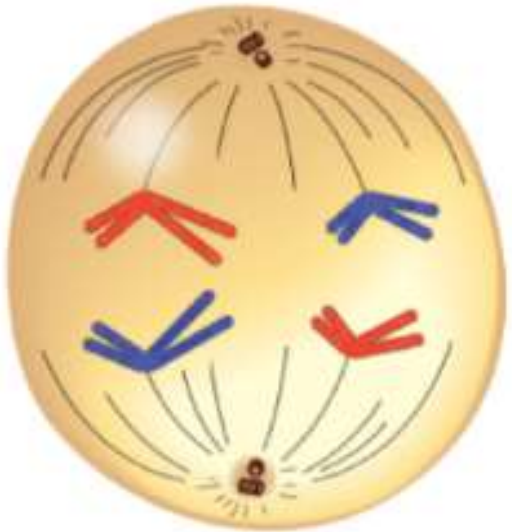
MEIOSIS I: METAPHASE I

- Spindle fibers guide chromosome movement by attaching to the chromosomes centromere.
- Homologous chromosome pairs line up along the middle of the cell



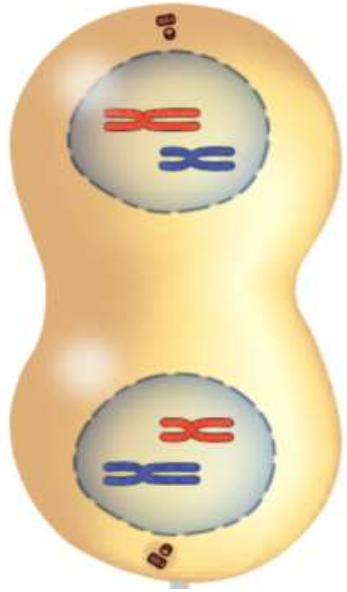
MEIOSIS I: ANAPHASE I

- Homologous chromosome pairs separate and go to each end of the cell



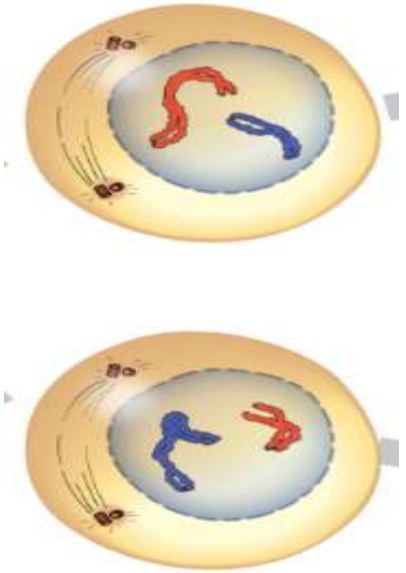
MEIOSIS I: TELOPHASE I

- Two nuclei form
- Each nucleus contains a complete copy of the cell's DNA



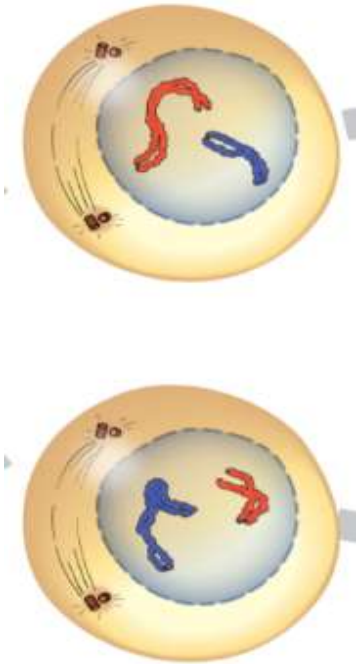
CYTOKINESIS

- The cell will split in two and form two haploid daughter cells



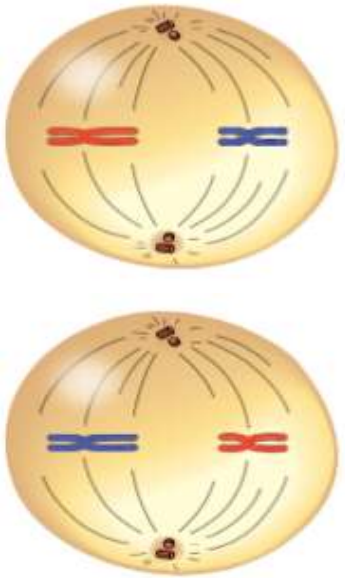
METAPHASE II: PROPHASE II

- Nuclear membrane begins to disappear
- DNA exists as chromosomes
- Spindle fibers begin to form



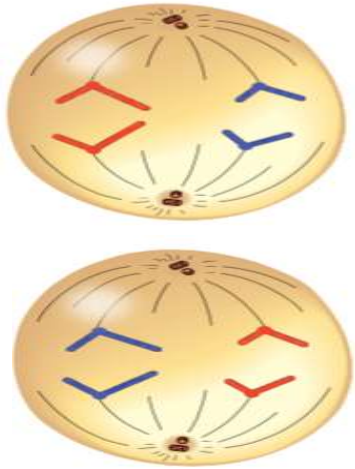
MEIOSIS II: METAPHASE II

- Chromosomes line up along the middle of the cell

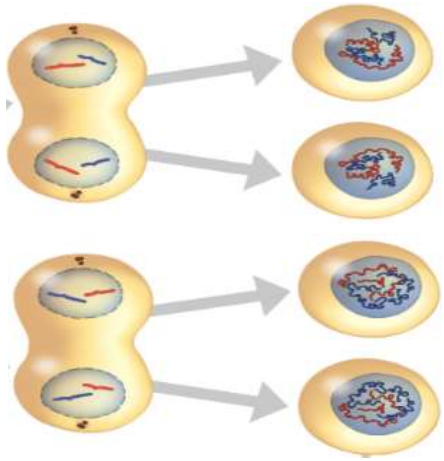


MEIOSIS II: ANAPHASE II

- Copies of DNA are separated and go to each end of the cell
  - This time, it is the sister chromatids are separated and pulled towards opposite poles of the cell

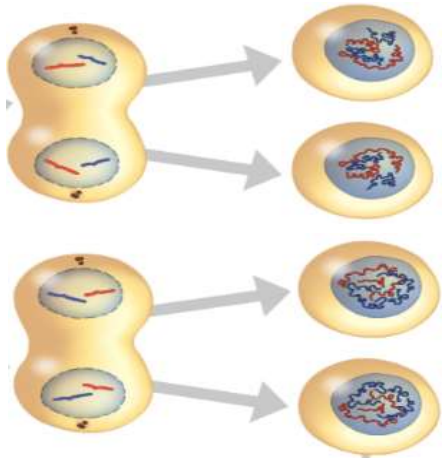


MEIOSIS II: TELOPHASE II

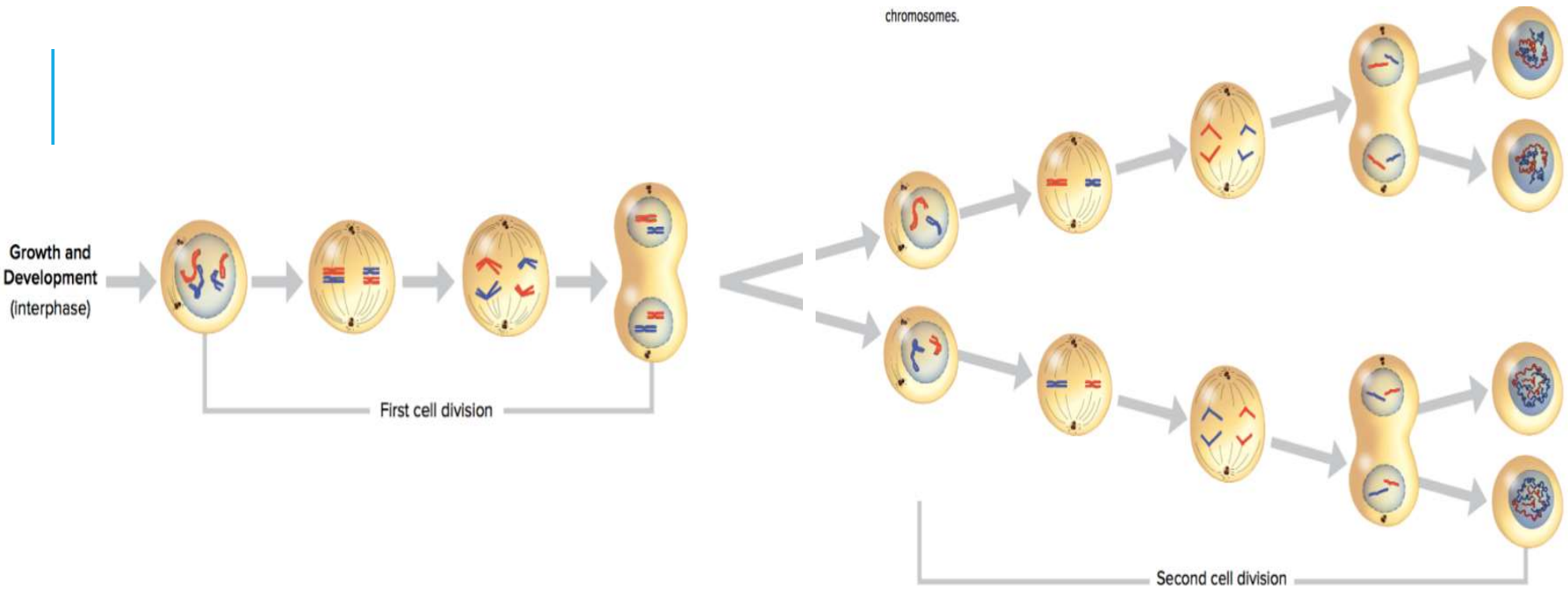


- Four nuclei form
- Nuclear membranes form around each set of chromosomes and the chromosomes decondense.

CYTOKINESIS



- Cell divides, forming four new haploid cells
  - For humans, the products of meiosis would be gametes



Meiosis produces four haploid cells from one diploid cell. These haploid cells are the gametes that take part in sexual reproduction.

PRACTICE

Workbook: pg 26, 27