Theory and exercises on Meiosis II

Tolentino Tuition
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Contents

The purpose of and ingredients for Meiosis

Sole purpose,

to produce gametes[1] *for fertilisation*[2]

[1]Gametes refer to either sperm or egg cells

[2]The process wherein the nucleus of a sperm cell fuses with the nucleus of an egg cell.

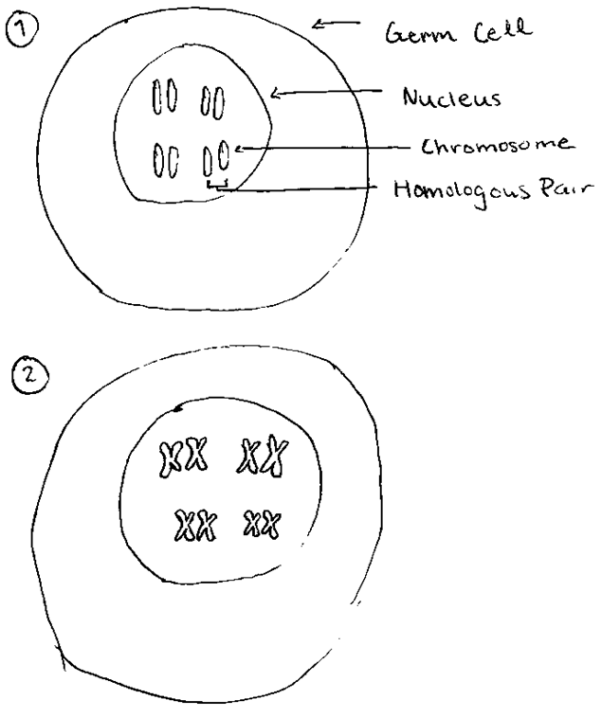
Ingredients

There is actually only one ingredient.
Meiosis begins with 1 *diploid germ cell*[3] *which has had its DNA replicated.*

[1]Germ cells are diploid cells located in the testes in males, and the ovaries in females.

Question

Which of the cells on the right are ready to undergo Meiosis, and why?



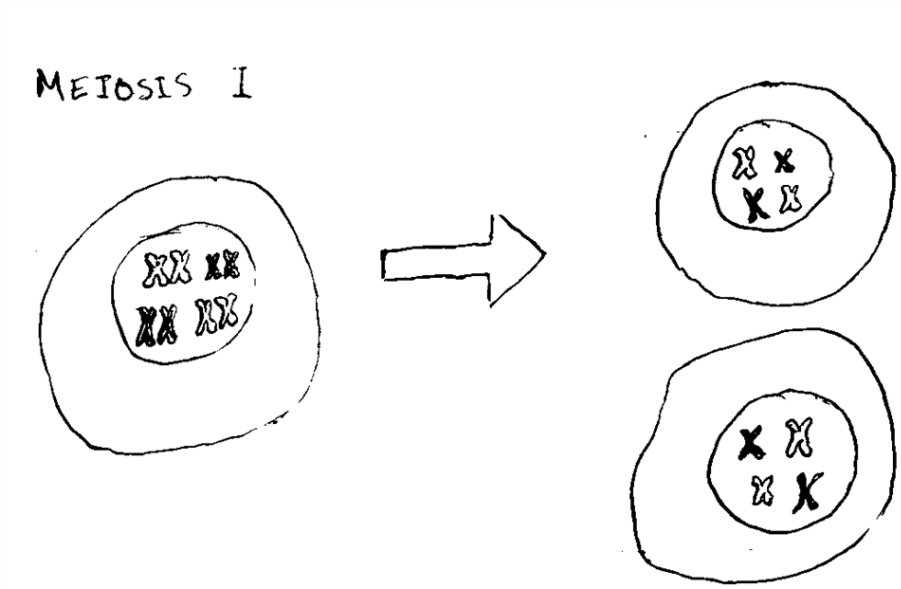
Meiosis part I

Meiosis has two parts,

Meiosis I and Meiosis II

Each has a different purpose.

Meiosis I turns 1 diploid germ cell with replicated chromosomes into two haploid cells with replicated chromosomes.



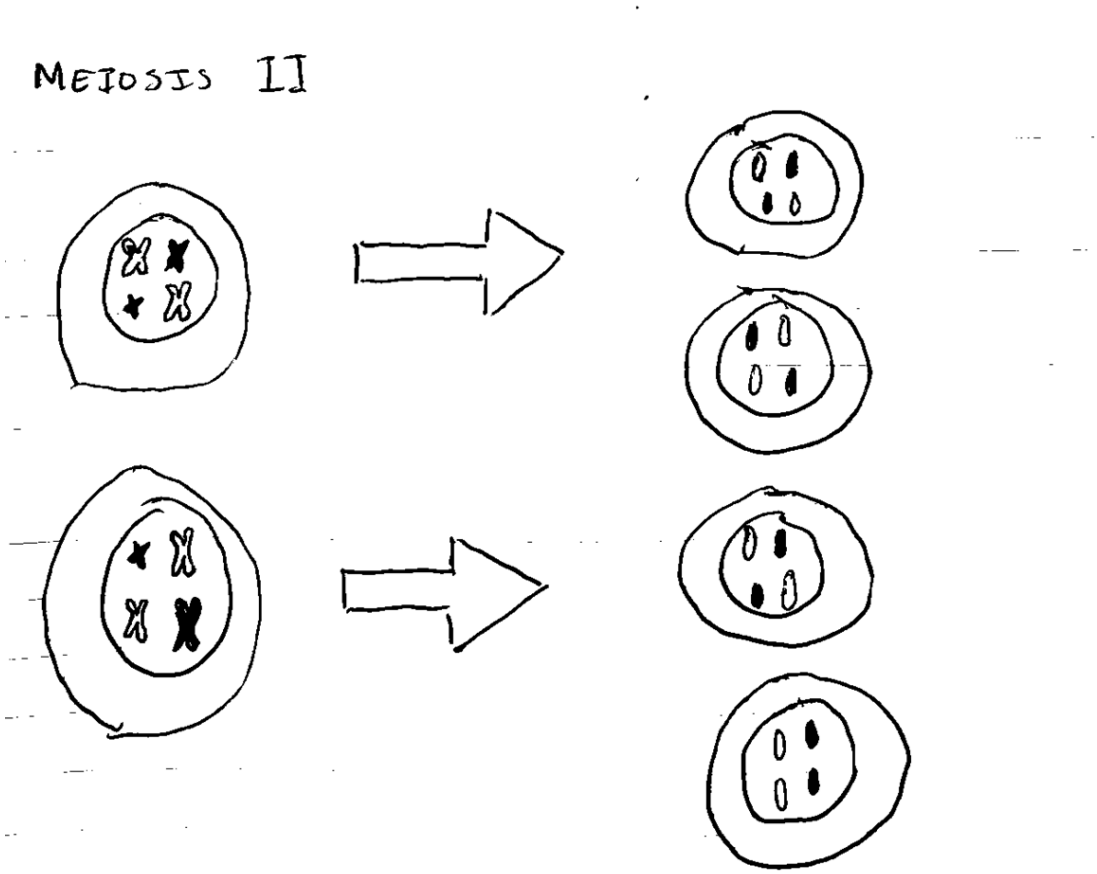
Questions

1. Why is the germ cell referred to as diploid?

2. Why are the two daughter cells of Meiosis I referred to as haploid?

3. Why do the two daughter cells of Meiosis I still contain replicated chromosomes?

Meiosis II takes the two haploid cells with replicated chromosomes from Meiosis I and turns each of them into two haploid cells with unreplicated chromosomes.



Questions

1. What type of cell are the 4 haploid cells produced in Meiosis II?

    a. What is their purpose?

    b. Where within the body is Meiosis (I and II) taking place?

PMAT cytokinesis I and II

Meiosis has two parts,

Meiosis I and Meiosis II

These two parts have 5 further parts each

Meiosis I

- *Prophase I*
- *Metaphase I*
- *Anaphase I*
- *Telophase I*
- *Cytokinesis I*

Meiosis II

- *Prophase II*
- *Metaphase II*
- *Anaphase II*
- *Telophase II*
- *Cytokinesis II*

Question

1. Can you list all differences between PMAT I and PMAT II?

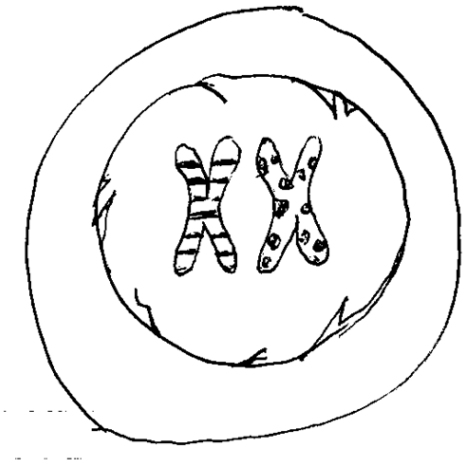
Crossing over and independent assortment

Meiosis has two parts,

Meiosis I and Meiosis II

These two parts have 5 further parts each, and one additional event occurs in Prophase I and Metaphase I.

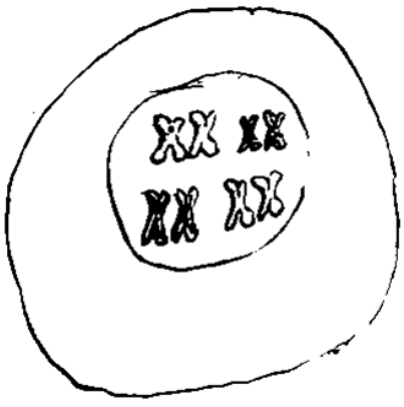
Meiosis I
- *Prophase I*
  - *Crossing over*
- *Metaphase I*
  - *Independent assortment*
- *Anaphase I*
- *Telophase I*
- *Cytokinesis I*



Question

Above is a cell in Prophase I. Can you create an illustration depicting crossing over in this cell?

Meiosis II
- *Prophase II*
- *Metaphase II*
- *Anaphase II*
- *Telophase II*
- *Cytokinesis II*



Question

Above is a cell that has completed Prophase I. Can you create an illustration depicting independent assortment in this cell?

Further exercise

1. Please complete the following diagram depicting Meiosis occurring upon the following cell, ensuring to include independent assortment and crossing over.