

Active Reading

Section: Meiosis

Read the passage below. Then answer the questions that follow.

Meiosis is a form of cell division that halves the number of chromosomes when forming specialized reproductive cells, such as gametes or spores. Meiosis involves two divisions of the nucleus—meiosis I and meiosis II.

The stages of meiosis I are as follows:

Prophase I: The chromosomes condense, and the nuclear envelope breaks down. Homologous chromosomes pair along their length and then cross over.

Metaphase I: The pairs of homologous chromosomes are moved by the spindle to the equator of the cell. The homologous chromosomes, each made up of two chromatids, remain together.

Anaphase I: The homologous chromosomes separate. As in mitosis, the chromosomes of each pair are pulled to opposite poles of the cell by the spindle fibers. But in meiosis, the chromatids do not separate at their centromeres.

Telophase I: Individual chromosomes gather at each of the poles. In most organisms, the cytoplasm divides, forming two new cells.

SKILL: READING EFFECTIVELY

Match each statement with the stage of meiosis I it describes by writing in the spaces provided, *PI* to represent Prophase I, *MI* to represent Metaphase I, *AI* to represent Anaphase I, or *TI* to represent Telophase I.

- _____ 1. cytoplasm divides
- _____ 2. nuclear envelope breaks down
- _____ 3. homologous chromosomes separate
- _____ 4. spindle moves homologous chromosomes to the cell's equator
- _____ 5. crossing-over occurs
- _____ 6. two new cells form
- _____ 7. homologous chromosomes move to opposite poles of the cell
- _____ 8. chromosomes condense

Active Reading *continued*

Read the passage below. Then answer the questions that follow.

The stages of meiosis II are as follows:

Prophase II: A new spindle forms around the chromosomes.

Metaphase II: The chromosomes line up along the equator, attached at their centromeres to spindle fibers.

Anaphase II: The centromeres divide, and the chromatids (now called chromosomes) move to opposite poles of the cell.

Telophase II: A nuclear envelope forms around each set of chromosomes. The spindle breaks down, and the cell undergoes cytokinesis. The result of meiosis is four haploid cells.

Match each statement with the stage of meiosis II it describes by writing in the spaces provided, *P/II* to represent Prophase II, *M/II* to represent Metaphase II, *A/II* to represent Anaphase II, or *T/II* to represent Telophase II.

- _____ 9. centromeres divide
- _____ 10. new spindle forms
- _____ 11. cell undergoes cytokinesis
- _____ 12. chromosomes line up at equator
- _____ 13. spindle breaks down
- _____ 14. chromosomes move to opposite poles of the cell
- _____ 15. four haploid cells form

In the space provided, write the letter of the term or phrase that best completes the statement.

- _____ 16. Between meiosis I and meiosis II, chromosomes do NOT
 - a. replicate.
 - b. change position.
 - c. divide.
 - d. Both (a) and (b)