

Skills Worksheet

## Directed Reading

### Section: Meiosis

Read each question, and write your answer in the space provided.

1. What is meiosis?

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2. Explain the difference between meiosis I and meiosis II.

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3. List the stages of meiosis in the order that they occur.

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4. What is crossing-over?

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**Directed Reading** *continued*

**In the space provided, write the name of the stage of meiosis that is being described.**

- \_\_\_\_\_ 5. The centromeres divide, and the chromatids move to opposite poles of the cell.
- \_\_\_\_\_ 6. The homologous chromosomes separate. The chromosomes of each pair are pulled to opposite poles of the cell by the spindle fibers. The chromatids do not separate at their centromeres.
- \_\_\_\_\_ 7. The chromosomes condense, and the nuclear envelope breaks down. Homologous chromosomes pair all along their length and then cross over.
- \_\_\_\_\_ 8. After one division of the nucleus, a new spindle forms around each group of chromosomes.
- \_\_\_\_\_ 9. Individual chromosomes line up along the equator, attached at their centromeres to spindle fibers.
- \_\_\_\_\_ 10. A nuclear envelope forms around each set of chromosomes. Two cells undergo cytokinesis, forming haploid offspring cells.
- \_\_\_\_\_ 11. Individual chromosomes gather at each of the two poles. In most organisms, the cytoplasm divides, forming two new cells.
- \_\_\_\_\_ 12. 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.

**Directed Reading** *continued*

**Read each question, and write your answer in the space provided.**

- 13.** What is crossing-over? During which phase of meiosis does crossing-over occur?

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- 14.** What is independent assortment? During which phase(s) of meiosis does independent assortment occur?

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- 15.** What are spermatogenesis and oogenesis?

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- 16.** What is the difference between undifferentiated sperm cells and sperm?

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- 17.** Why does meiosis produce four sperm cells but only one ovum?

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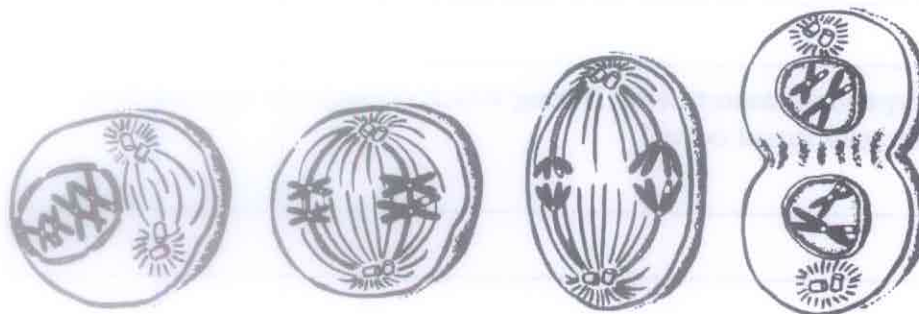
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Skills Worksheet

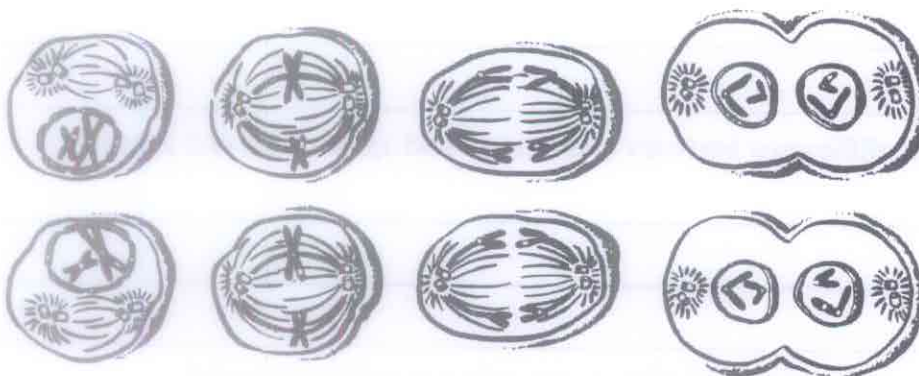
# Science Skills

## SEQUENCING/ORGANIZING INFORMATION

In the space provided in the figure below, write the letter of the stage of meiosis from the list below (a-h) that matches each stage in the figure.



1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_



5. \_\_\_\_\_ 6. \_\_\_\_\_ 7. \_\_\_\_\_ 8. \_\_\_\_\_

### Stages of Meiosis

- |                 |                                 |
|-----------------|---------------------------------|
| a. anaphase II  | e. telophase II and cytokinesis |
| b. metaphase I  | f. telophase I and cytokinesis  |
| c. anaphase I   | g. prophase I                   |
| d. metaphase II | h. prophase II                  |

**Science Skills** *continued*

**In the space provided, write the letter of the description that best matches the stage of meiosis.**

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|------------------------|--|
| _____ 9. metaphase I   | a. A new spindle forms around the chromosomes.   |
| _____ 10. prophase II  | b. Chromatids remain attached at their centromeres as the spindle fibers move the homologous chromosomes to opposite poles of the cell.          |
| _____ 11. telophase I  | c. A nuclear envelope forms around each set of chromosomes, the spindle breaks down, and the cytoplasm divides, resulting in four haploid cells. |
| _____ 12. metaphase II | d. Chromosomes gather at the poles; the cytoplasm divides.   |
| _____ 13. telophase II | e. The nuclear envelope breaks down; genetic material is exchanged through crossing-over.  |
| _____ 14. anaphase II  | f. Chromosomes line up at the equator.   |
| _____ 15. prophase I   | g. Pairs of homologous chromosomes line up at the equator.   |
| _____ 16. anaphase I   | h. Centromeres divide, enabling the chromatids, now called chromosomes, to move to opposite poles of the cell.                                   |

