

# Exercises on Meiosis with Answer Key

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## Exercise 1: Describe the stages of meiosis

List the main stages of meiosis and specify the major events occurring in each.

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## Exercise 2: Differences between mitosis and meiosis

Complete the table below by indicating the differences between mitosis and meiosis.

Criterion	Mitosis	Meiosis
Number of divisions	1	2
Daughter cells	2	4
Number of chromosomes	2n	n
Genetic diversity	Low	High

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## Exercise 3: Analyzing a karyotype after meiosis

A diploid organism has 8 chromosomes. How many chromosomes and chromatids are present:

- a) In metaphase I?
  - b) In metaphase II?
  - c) In a final daughter cell?
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## Exercise 4: Identify the phases of meiosis

Match the following descriptions to the correct phases of meiosis:

- 1. Separation of homologous chromosomes.
  - 2. Crossing-over between non-sister chromatids.
  - 3. Formation of four haploid cells.
  - 4. Alignment of single chromosomes at the equatorial plate.
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## Exercise 5: Diagram and explanation

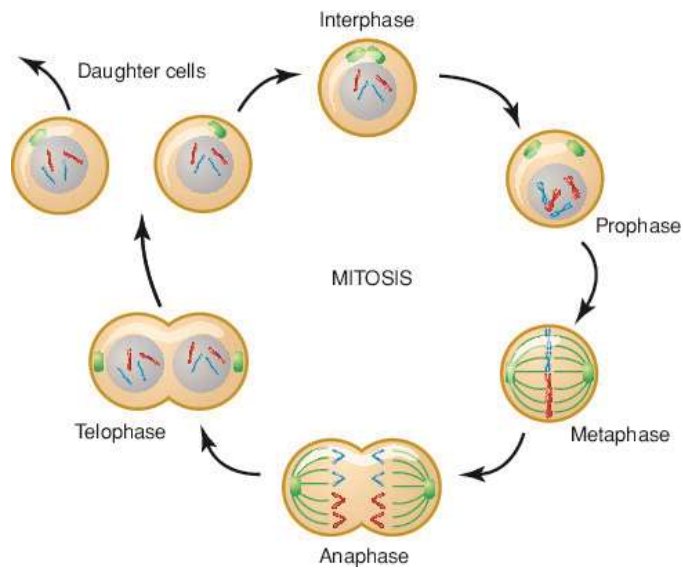
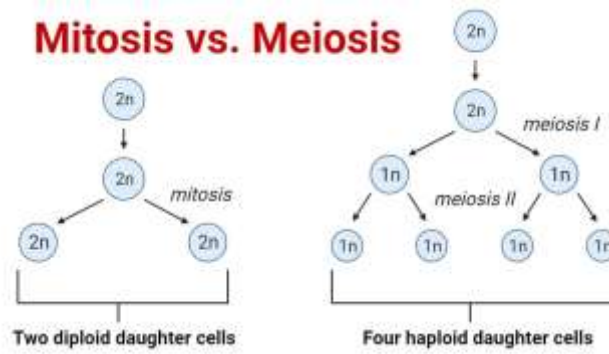
Draw a diagram illustrating a cell transitioning from prophase I to telophase II. Provide an explanation of how the chromosome number is reduced.

## Multiple Choice Questions (MCQs) on Mitosis and Meiosis

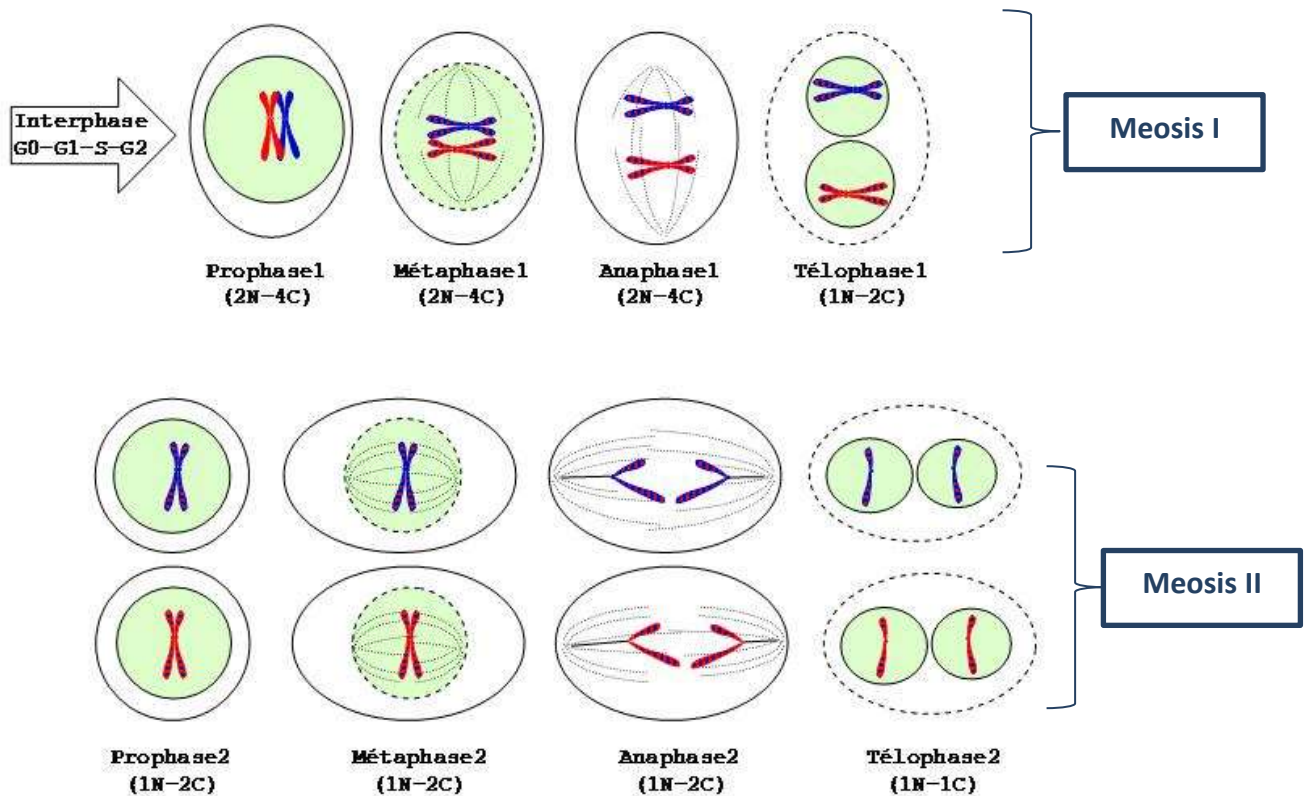
### Questions

1. **What is the main function of mitosis?**
    - A) Production of sex cells
    - B) Repair and growth of tissues
    - C) Reduction of chromosome number
    - D) Exchange of genetic material
  2. **How many daughter cells are produced at the end of meiosis?**
    - A) 1
    - B) 2
    - C) 3
    - D) 4
  3. **Which phase of mitosis is characterized by the alignment of chromosomes at the cell's center?**
    - A) Prophase
    - B) Metaphase
    - C) Anaphase
    - D) Telophase
  4. **During which phase of meiosis does crossing-over occur?**
    - A) Prophase I
    - B) Metaphase I
    - C) Anaphase II
    - D) Telophase II
  5. **What is the primary difference between mitosis and meiosis in terms of genetic diversity?**
    - A) Mitosis increases genetic diversity
    - B) Meiosis produces genetically identical cells
    - C) Meiosis increases genetic diversity
    - D) Mitosis reduces genetic diversity
  6. **What is the number of chromosomes in each daughter cell after mitosis in humans?**
    - A) 23
    - B) 46
    - C) 69
    - D) 92
  7. **Which structure forms during prophase of mitosis to aid in chromosome separation?**
    - A) Nuclear membrane
    - B) Mitotic spindle
    - C) Nucleolus
    - D) Cell wall
  8. **What is the main function of meiosis?**
    - A) Cellular repair
    - B) Tissue growth
    - C) Production of gametes
    - D) Protein synthesis
  9. **Which phase of meiosis is directly responsible for halving the chromosome number?**
    - A) Prophase II
    - B) Metaphase II
    - C) Anaphase I
    - D) Telophase I
  10. **What is the key difference between anaphase of mitosis and anaphase I of meiosis?**
    - A) Separation of sister chromatids in both
    - B) Separation of homologous chromosomes in anaphase I of meiosis
    - C) Separation of sister chromatids in anaphase I of meiosis
    - D) No chromosome separation in anaphase of mitosis
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## Mitosis vs. Meiosis



### Mitosis



### Meiosis