What is Meiosis?

Worksheet

Meiosis is a two-round division (Meiosis I and Meiosis II) that turns one diploid cell into four genetically unique haploid gametes, halving the chromosome number so it's restored at fertilization.

Questions

1. How many cells does one round of meiosis produce from a single diploid cell?

A) 1
B) 2
C) 4
D) 8

2. Crossing over occurs during which phase?

A) Prophase I
B) Metaphase II
C) Anaphase I
D) Telophase II

3. If a parent cell has 46 chromosomes, how many does each product of meiosis have?

A) 46
B) 23
C) 92
D) 12

4. What is the main biological purpose of meiosis?

A) Tissue repair
B) Producing genetically varied gametes
C) Cloning identical cells
D) Growth of the organism

5. A human somatic cell has 46 chromosomes. How many chromosomes does each gamete produced by meiosis contain?

6. One primary spermatocyte enters meiosis. How many functional sperm cells does it ultimately produce?

7. A cell with 8 chromosomes (4 homologous pairs) undergoes meiosis. How many different chromosome combinations are possible in its gametes from independent assortment alone?

8. Define: What is meiosis?

9. Define: How many daughter cells does meiosis produce?

10. Define: What creates genetic variation in meiosis?

Answer Key

1. C) 4 - Meiosis I and II together produce four haploid cells.

2. A) Prophase I - Homologous chromosomes exchange DNA segments during Prophase I.

3. B) 23 - Meiosis halves the chromosome number: 46 2 = 23.

4. B) Producing genetically varied gametes - Meiosis produces haploid gametes with genetic variation for sexual reproduction.

5. Meiosis halves the chromosome number (diploid haploid) 46 2 = 23 Each gamete contains 23 chromosomes

6. Meiosis I splits it into 2 secondary spermatocytes Meiosis II splits each of those into 2 spermatids 2 2 = 4 All 4 spermatids mature into functional sperm

7. Possible combinations = 2, where n = number of homologous pairs n = 4 2 = 16 So 16 different combinations are possible

8. A two-round cell division that produces four haploid gametes from one diploid cell.

9. Four, each with half the chromosome number of the parent cell.

10. Crossing over (in Prophase I) and independent assortment of chromosomes.