What is Mitosis and Meiosis?

Worksheet

Mitosis is cell division that produces two genetically identical diploid cells for growth and repair, while meiosis is cell division that produces four genetically unique haploid gametes for sexual reproduction.

Questions

1. Which process produces two genetically identical daughter cells?

A) Meiosis
B) Mitosis
C) Fertilization
D) Crossing over

2. How many daughter cells result from meiosis?

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

3. Where does crossing over occur?

A) Mitosis, metaphase
B) Meiosis I, prophase I
C) Meiosis II, anaphase II
D) Mitosis, telophase

4. If a parent cell has 46 chromosomes, how many chromosomes does each cell have after meiosis?

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

5. A skin cell with 46 chromosomes divides by mitosis to repair a wound. How many chromosomes does each daughter cell have?

6. A human germ cell with 46 chromosomes undergoes meiosis to form gametes. How many chromosomes does each resulting sperm cell have?

7. Why do siblings from the same parents look different from each other, even though both were produced by meiosis from the same two parents?

8. Define: What is mitosis used for?

9. Define: What is meiosis used for?

10. Define: How many daughter cells does mitosis produce, and how many does meiosis produce?

Answer Key

1. B) Mitosis - Mitosis creates two diploid cells identical to the parent cell.

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

3. B) Meiosis I, prophase I - Crossing over happens during prophase I of meiosis, increasing genetic variation.

4. C) 23 - Meiosis halves the chromosome number, producing haploid (23) cells in humans.

5. Mitosis produces two daughter cells genetically identical to the parent Chromosome number stays the same - no reduction occurs Each daughter cell has 46 chromosomes, same as the original skin cell

6. Meiosis involves two rounds of division (meiosis I and II) The chromosome number is halved to produce haploid cells Each of the four resulting sperm cells has 23 chromosomes (46 2)

7. Meiosis includes crossing over during prophase I, which shuffles genetic material between homologous chromosomes Independent assortment randomly distributes chromosomes into gametes These two processes create genetically unique gametes each time, so siblings inherit different combinations of genes

8. Growth, tissue repair, and asexual reproduction - producing identical diploid cells.

9. Producing genetically unique haploid gametes (sperm and eggs) for sexual reproduction.

10. Mitosis produces 2 identical cells; meiosis produces 4 genetically unique cells.