Meiosis

Meiosis I

1. Sister chromatids

2. Nucleus disappears

3. Homologous chromosomes

4. Spindle forms

1. Spindle fibers attach to centromeres

2. Homologous chromosomes line up in pairs

1. Homologous chromosomes separate

2. Cell pinches in two

Meiosis II

1. Chromosomes still made up of sister chromatids

2. Spindle forms

1. Spindle fibers attach to centromeres

2. Chromosomes line up

2. Nucleus reforms

1. Sister chromatids separate

3. Cells pinches into two

Four sex cells

Prophase I

Metaphase I

Anaphase I–Telophase I

Prophase II

Metaphase II

Anaphase II–Telophase II

Use with Chapter 10, Section 10.2
1. How does the number of chromosomes in a sex cell compare with that in the parent cell?

2. If the number of chromosomes in the skin cells of an organism is 28, what is the number of chromosomes in the organism’s egg cells?

3. How many cells are produced at the end of meiosis II?

4. In which phase of meiosis does crossing over occur? What results from this process?

5. Describe the activity of chromosomes in metaphase I of meiosis. How does this activity differ from the activity of chromosomes in metaphase of mitosis?

6. In which phase of meiosis II does the cytoplasm divide?

7. Explain why mitosis could not provide for the sexual reproduction of offspring that contain the same number of chromosomes as the parents.
Mitosis Versus Meiosis

Reteaching Skills

Mitosis:
Overview

1. Homologous chromosomes line up unpaired
2. Sister chromatids separate

Meiosis:
Overview

1. Homologous chromosomes line up paired
2. Homologous chromosomes separate
3. Sister chromatids separate

Meiosis I: Reduction

- Step 1: Homologous chromosomes line up paired
- Step 2: Homologous chromosomes separate
- Step 3: Sister chromatids separate

Meiosis II:

- Step 1: Homologous chromosomes line up unpaired
- Step 2: Sister chromatids separate

Use with Chapter 10, Section 10.2
1. Define these terms.
   a. homologous chromosomes
   b. sister chromatids

2. Mitosis is a process of cell replication. Explain what this statement means.

3. Meiosis is a process of cell reduction. Explain this statement.

4. Which part of meiosis is similar to mitosis?

5. Identify whether each process below occurs during mitosis, meiosis, or both.
   a. Sister chromatids separate.
   b. Haploid cells are formed.
   c. Cell division occurs once.
   d. Homologous chromosomes pair.
   e. Four cells are the final result.
   f. Cell division occurs twice.
   g. Replicated chromosomes line up in the middle of the spindle.
   h. Two cells are the final result.
   i. Diploid cells are formed.

6. Define crossing over. When does it occur?