

# Meiosis I and Meiosis II; Life Cycles

Meiosis functions to reduce the number of chromosomes to one half. Each daughter cell that is produced will have one half as many chromosomes as the parent cell.

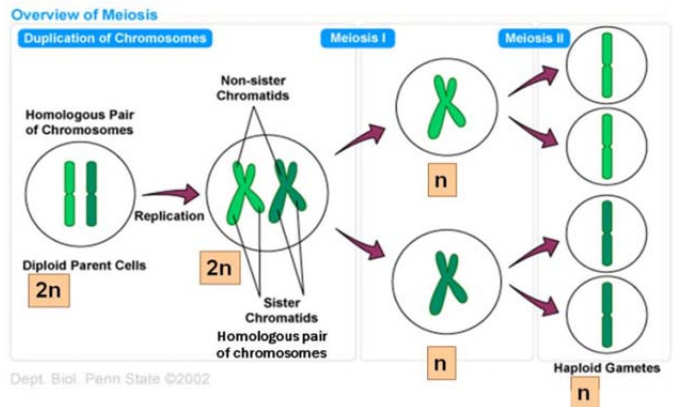
Meiosis is part of the sexual process because gametes (sperm, eggs) have one half the chromosomes as diploid (2N) individuals.

### Phases of Meiosis

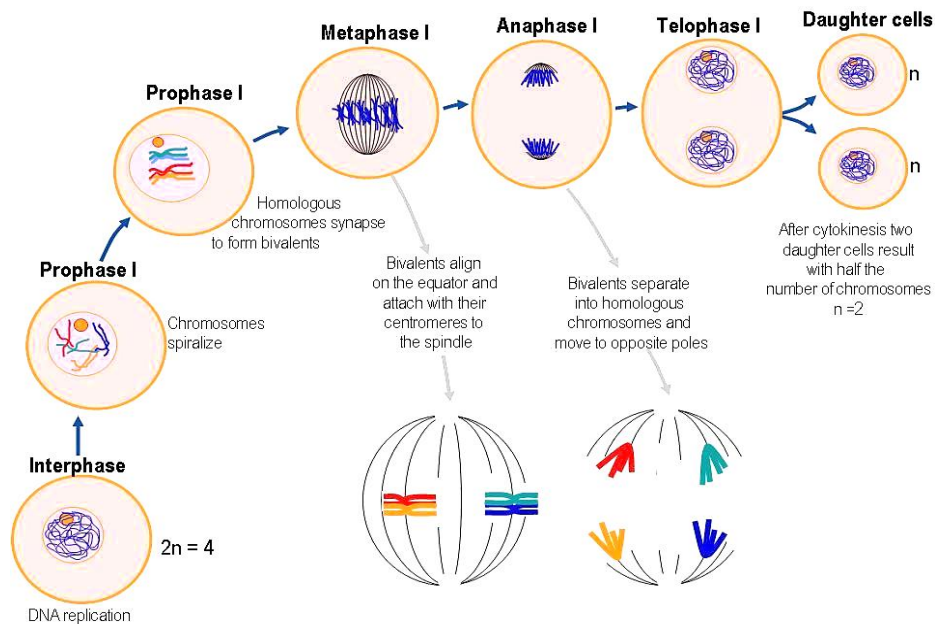
There are two divisions in meiosis; the first division is **meiosis I: the number of cells is doubled but the number of chromosomes is not. This results in 1/2 as many chromosomes per cell.** The second division is **meiosis II: this division is like mitosis; the number of chromosomes does not get reduced.** The phases have the same names as those of mitosis.

- **Meiosis I: prophase I (2N), metaphase I (2N), anaphase I (N+N), and telophase I (N+N)**
- **Meiosis II: prophase II (N+N), metaphase II (N+N), anaphase II (N+N+N+N), and telophase II (N+N+N+N)**

(Works Cited See) \*3



### Meiosis I



(Works Cited See) \*1

#### 1. **Prophase I**

Events that occur during prophase of mitosis also occur during prophase I of meiosis. The chromosomes coil up, the nuclear membrane begins to disintegrate, and the centrosomes begin moving apart.

The two chromosomes may exchange fragments by a process called **crossing over**.

When the chromosomes partially separate in late prophase, until they separate during anaphase resulting in chromosomes that are mixtures of the original two chromosomes.



#### 2. **Metaphase I**

Bivalents (tetrads) become aligned in the center of the cell and are attached to spindle fibers.

**Independent assortment** refers to the random arrangement of pairs of chromosomes.

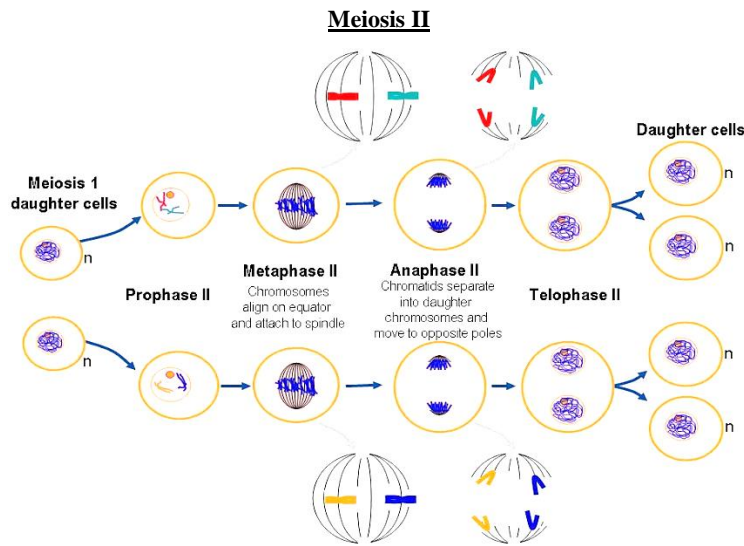
3. **Anaphase I**

Anaphase I begins when homologous chromosomes separate.

4. **Telophase I**

The nuclear envelope reforms and nucleoli reappear.

(Works Cited See) \*3



(Works Cited See) \*1

5. **Prophase II**

The chromosomes coil up, the nuclear membrane begins to disintegrate, and the centrosomes begin moving apart.

6. **Metaphase II**

Spindle fibers form and sister chromatids align to the equator of the cell.

7. **Anaphase II**

Sister chromatids separate.

8. **Telophase II & Cytokinesis II**

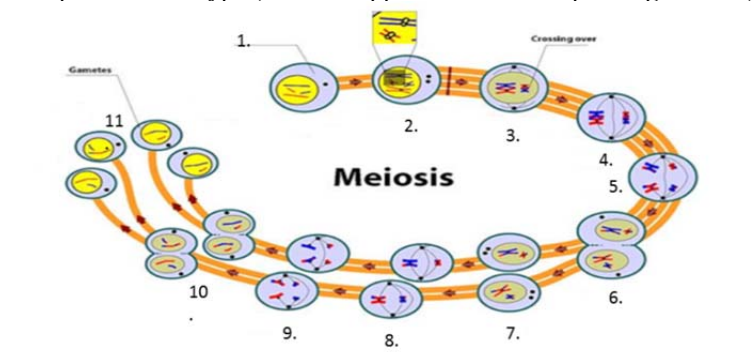
The chromatids reach the poles, and uncoil into thin threadlike chromatin. The nuclear membrane reforms from 2 diploid (2n) cells into 4 haploid (n) Daughter cells.

(Works Cited See) \*3

Works Cited

- \*1 Genetics Suite. (n.d.). Retrieved from <http://geneticsuite.net/node/19>
- \*2 Jolly, R. L. D. (Photograph). Retrieved from [http://creationev.wpengine.netdna-cdn.com/wpcontent/uploads/2011/03/Meiosis\\_diagram-adj.jpg](http://creationev.wpengine.netdna-cdn.com/wpcontent/uploads/2011/03/Meiosis_diagram-adj.jpg)
- \*3 Meiosis. (n.d.). Retrieved from <http://faculty.clintoncc.suny.edu/faculty/michael.gregory/files/Bio101/Bio101Lectures/Meiosis/meiosis.htm>

Label the diagram (1-11) with phase or cell type (for what applies to the corresponding number), and chromosome number.



(Works Cited See) \*2

**Answers:**

1. Mother Cell (G2) (2N) 2. Interphase (S) (2N) 3. Prophase I (2N) 4. Metaphase I (2N) 5. Anaphase I (N+N) 6. Telophase I (N+N) 7. Prophase II (N+N) 8. Metaphase II (N+N) 9. Anaphase II (N+N+N+N) 10. Telophase II (N+N+N+N) 11. Zygotes (N+N+N+N)