

Proses apa yang menyebabkan
terjadinya Variasi dan
diversitas?

MEIOSIS, THE BASIS OF SEXUAL REPRODUCTION

- Why do kids look different from the parents?
- How are they similar to their parents?
- Why aren't brothers or sisters more alike?

Homologous Chromosomes

- Different organisms of the same species have the same number and types of chromosomes
- Humans have 23 pairs of chromosomes.

- somatic cell
 - a normal body cell
 - 46 chromosomes in a human

- Homologous chromosomes: matching pairs of chromosomes

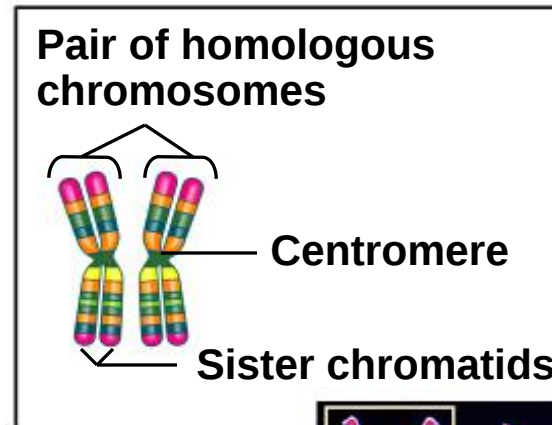


Figure 8.12

- Types of Chromosomes
 - Sex chromosomes: Humans each have 2.
 - X or Y
 - Males have XY and Females have: _____
 - Autosomes: 22 pairs of matching chromosomes.
 - Each pair codes for same traits and you get one from each parent.

Gametes and the Life Cycle of a Sexual Organism

- The life cycle of a multicellular organism is the sequence of stages leading from the adults of one generation to the adults of the next

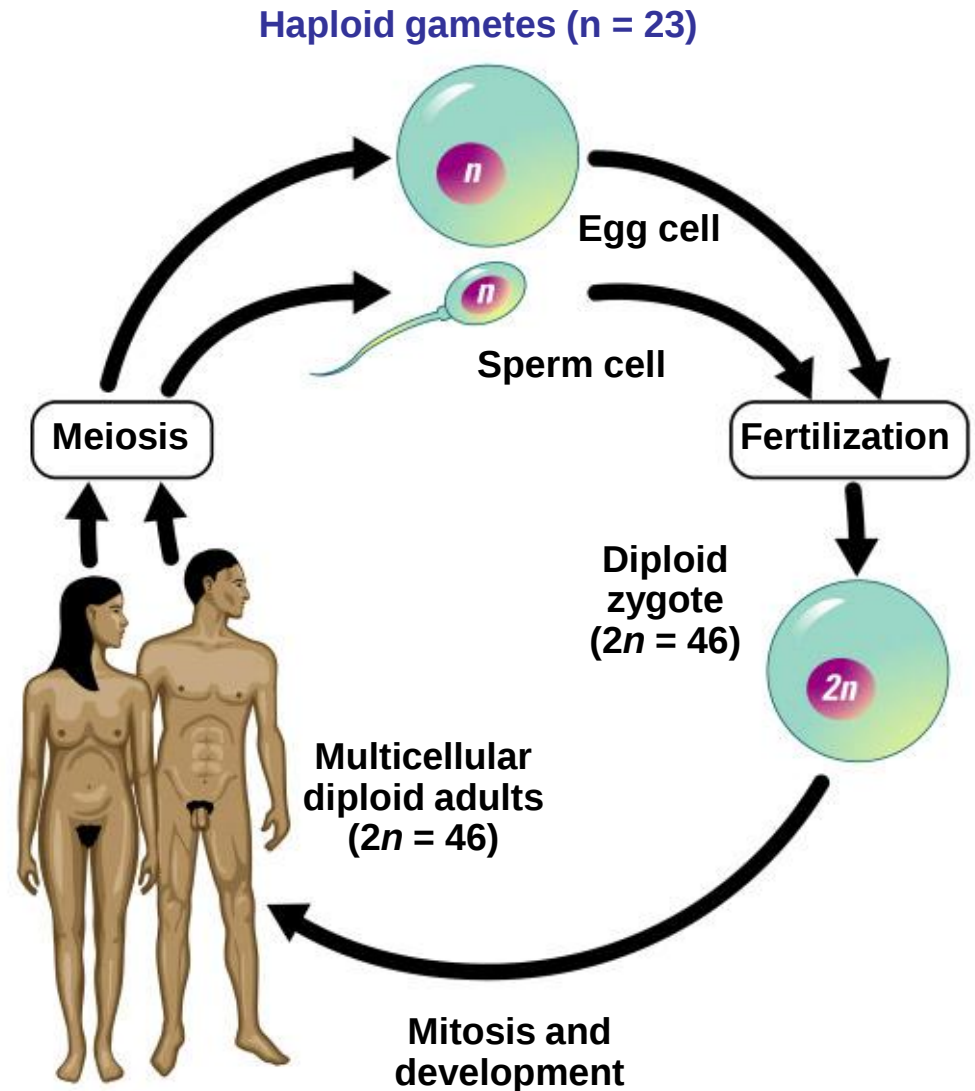


Figure 8.13

- Diploid: means having 2 sets of chromosomes.
 - All somatic cells are diploid.
- Haploid: have 1 set of chromosomes.
 - Sperm and Egg (gametes or reproductive cells)

- Fertilization
 - fusion of sperm and egg
 - Zygote = fertilized egg

- Sexual life cycles involve an alternation of diploid and haploid stages

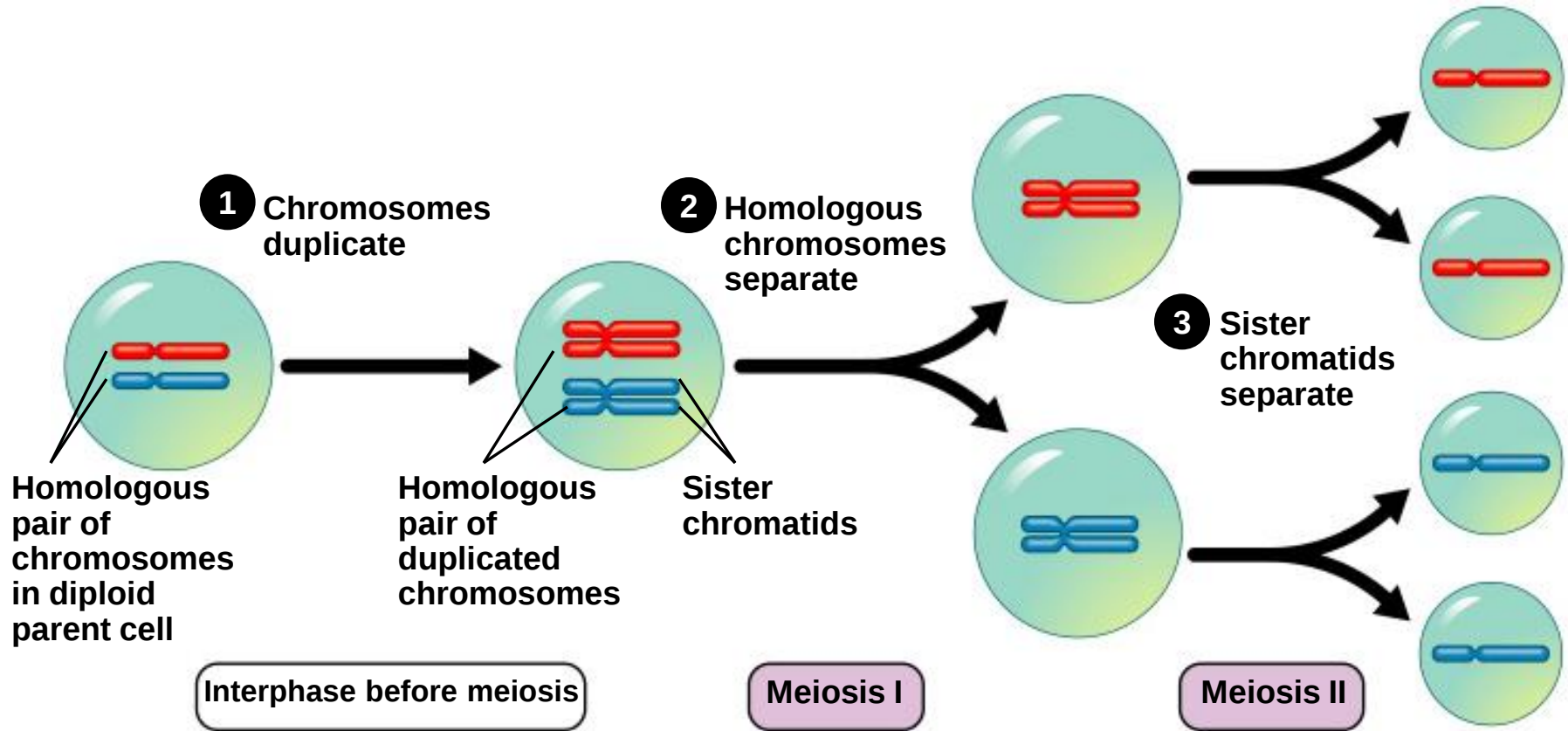


Figure 8.14

The Process of Meiosis

- Meiosis
 - Haploid gametes are produced in diploid organisms
 - Two consecutive divisions occur, meiosis I and meiosis II, preceded by interphase.

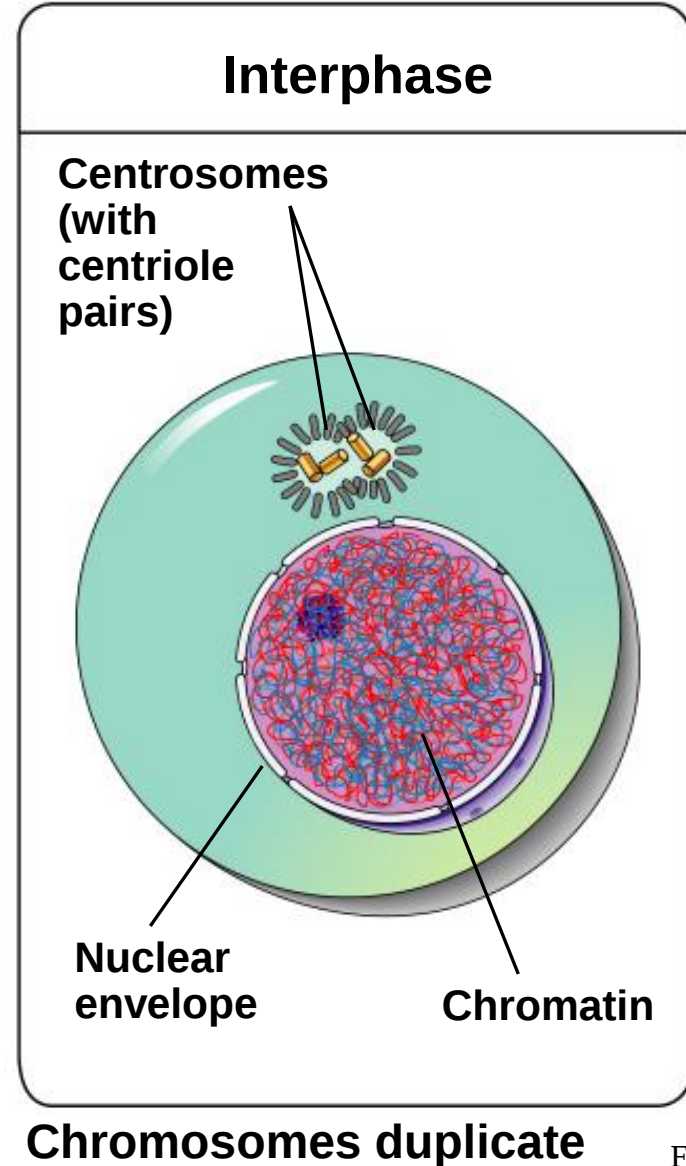


Figure 8.15.1

- Meiosis I: replication + division into 2 diploid Cells

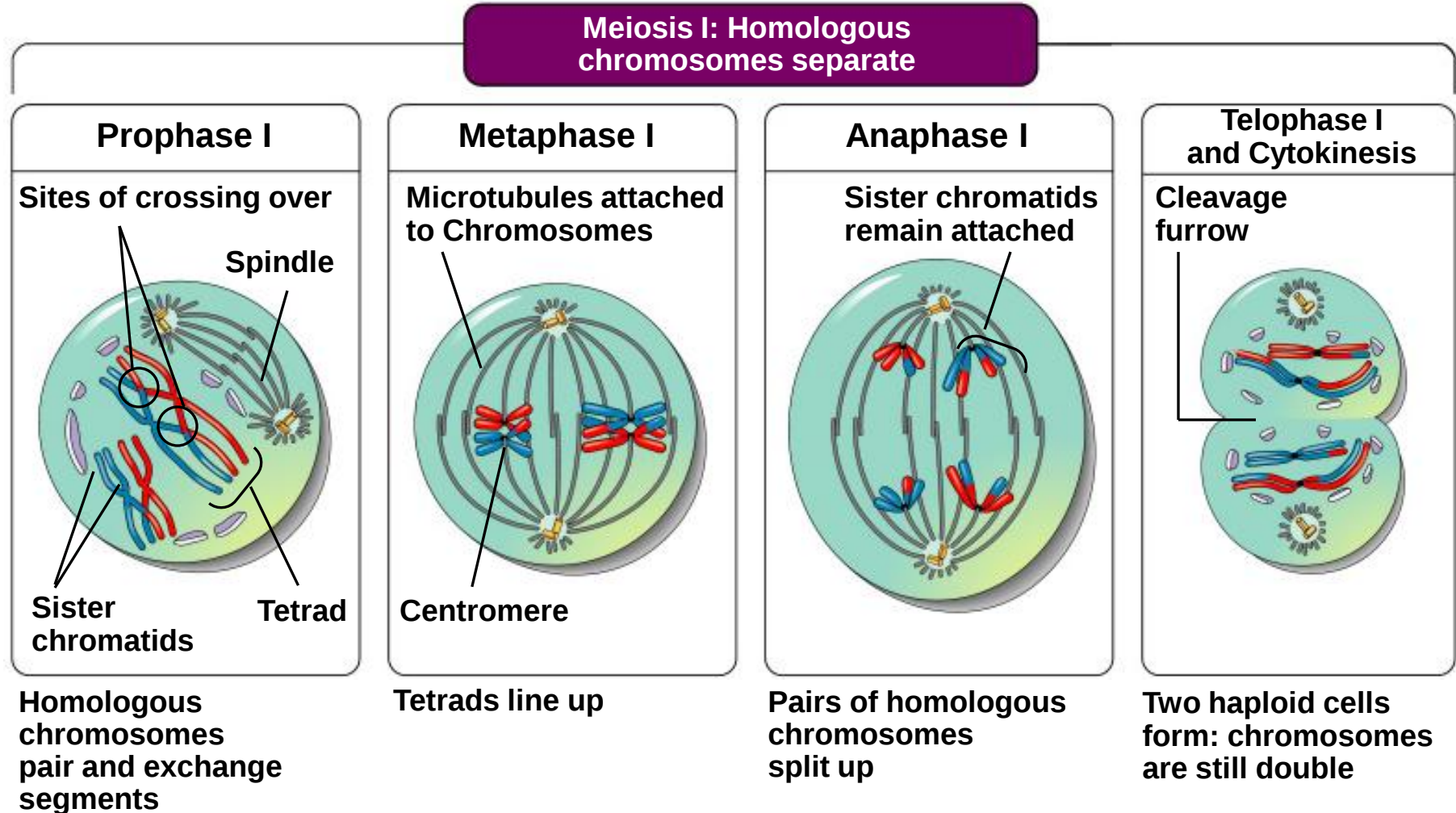
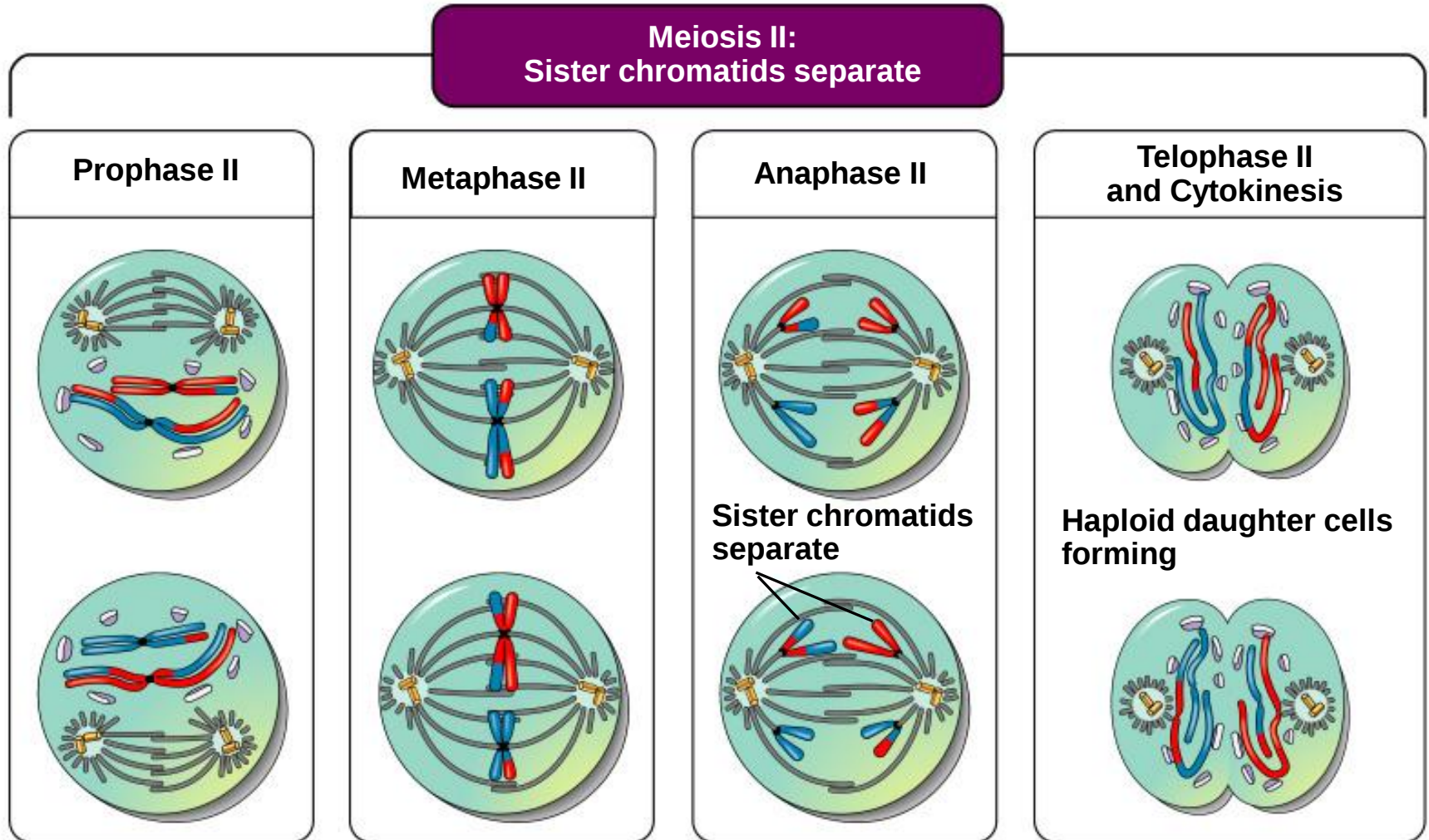


Figure 8.15.2

- Meiosis II: two divisions into 4 haploid cells. No replication.



During another round of cell division, the sister chromatids finally separate; four haploid daughter cells result, containing single chromosomes

Figure 8.15.3

Review: Comparing Mitosis and Meiosis

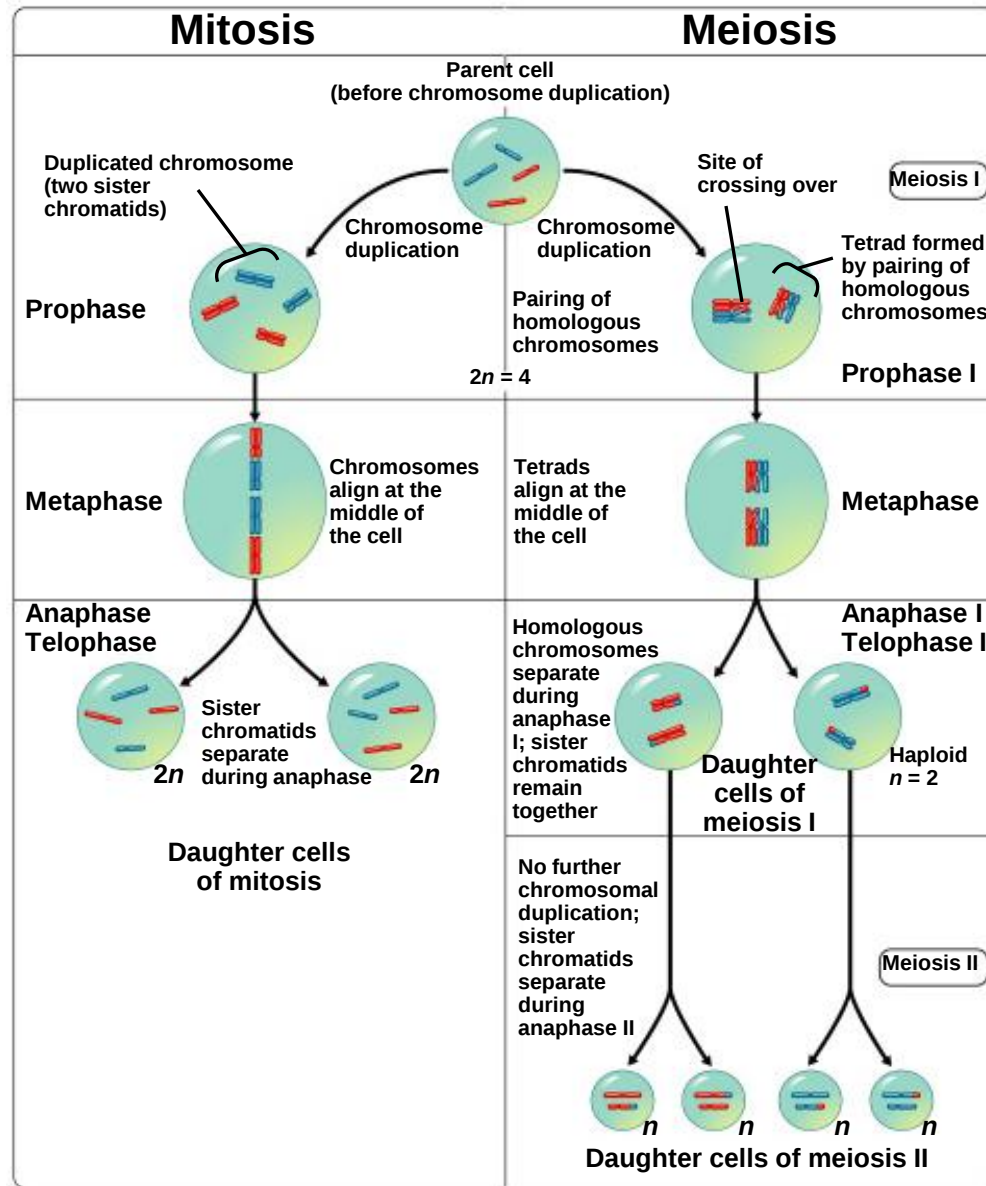


Figure 8.16

The Origins of Genetic Variation

- Offspring of sexual reproduction are genetically different from their parents and from one another

Independent Assortment of Chromosomes

- In independent assortment every chromosome pair orients independently of the others during meiosis

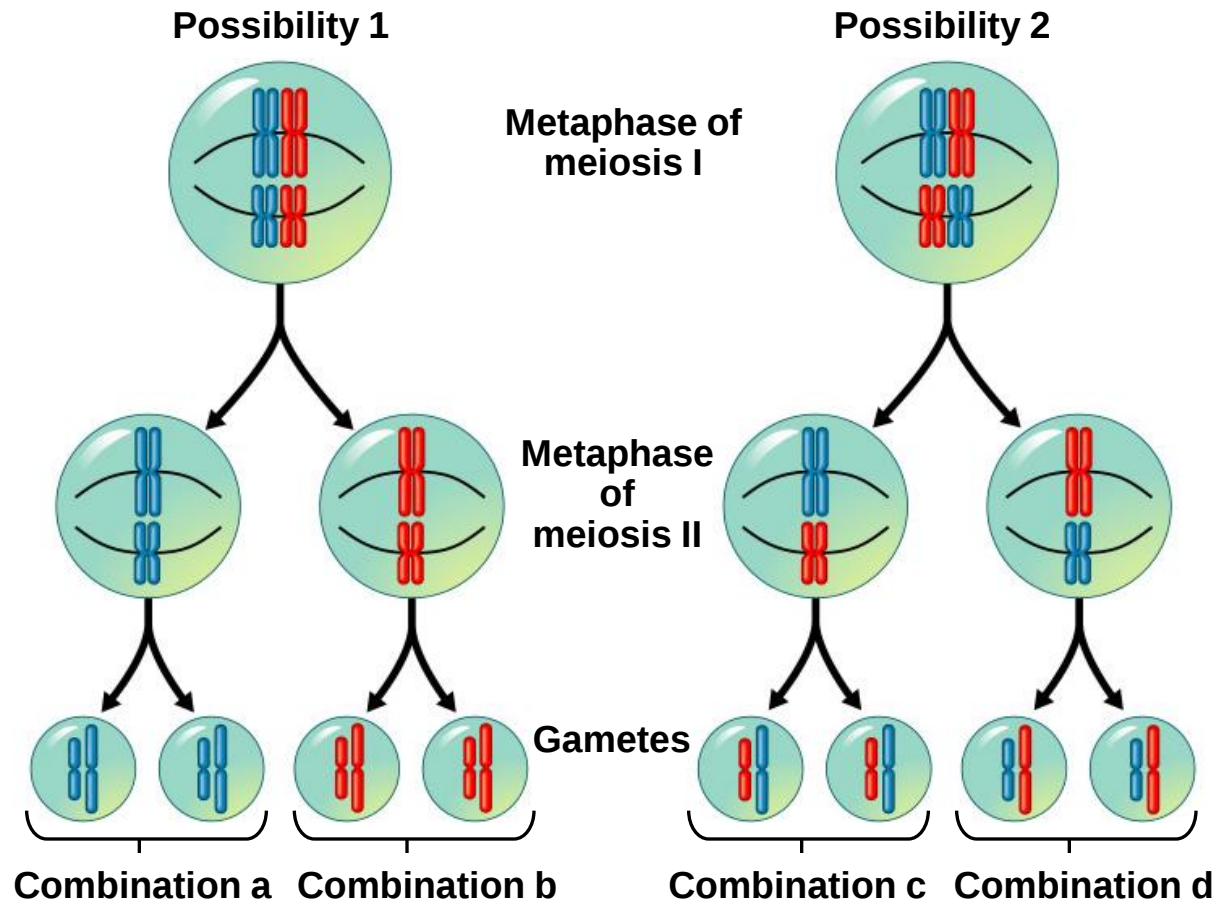


Figure 8.17

Random Fertilization

- The human egg cell is fertilized randomly by one sperm, leading to genetic variety in the zygote

Crossing Over

- Crossing over
 - Homologous chromosomes exchange genetic information
 - Genetic recombination occurs

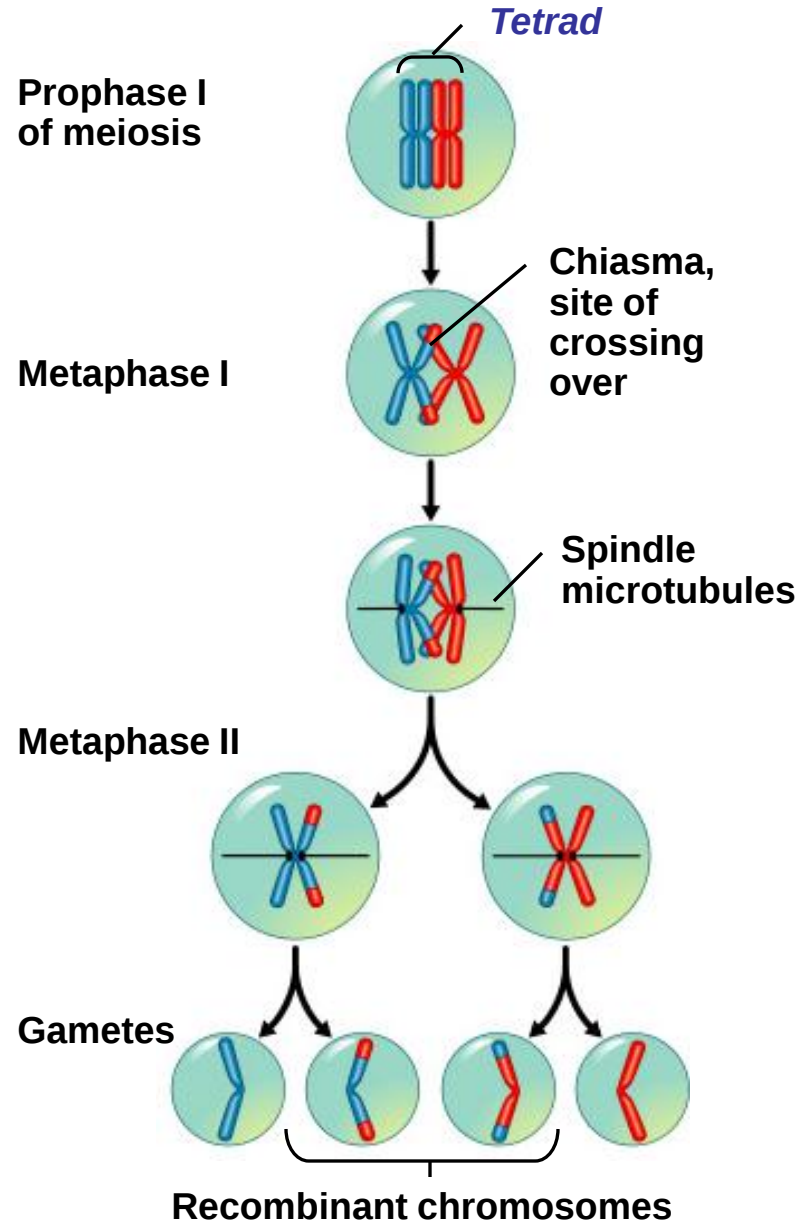


Figure 8.18

Review

- What leads to diversity and variation??