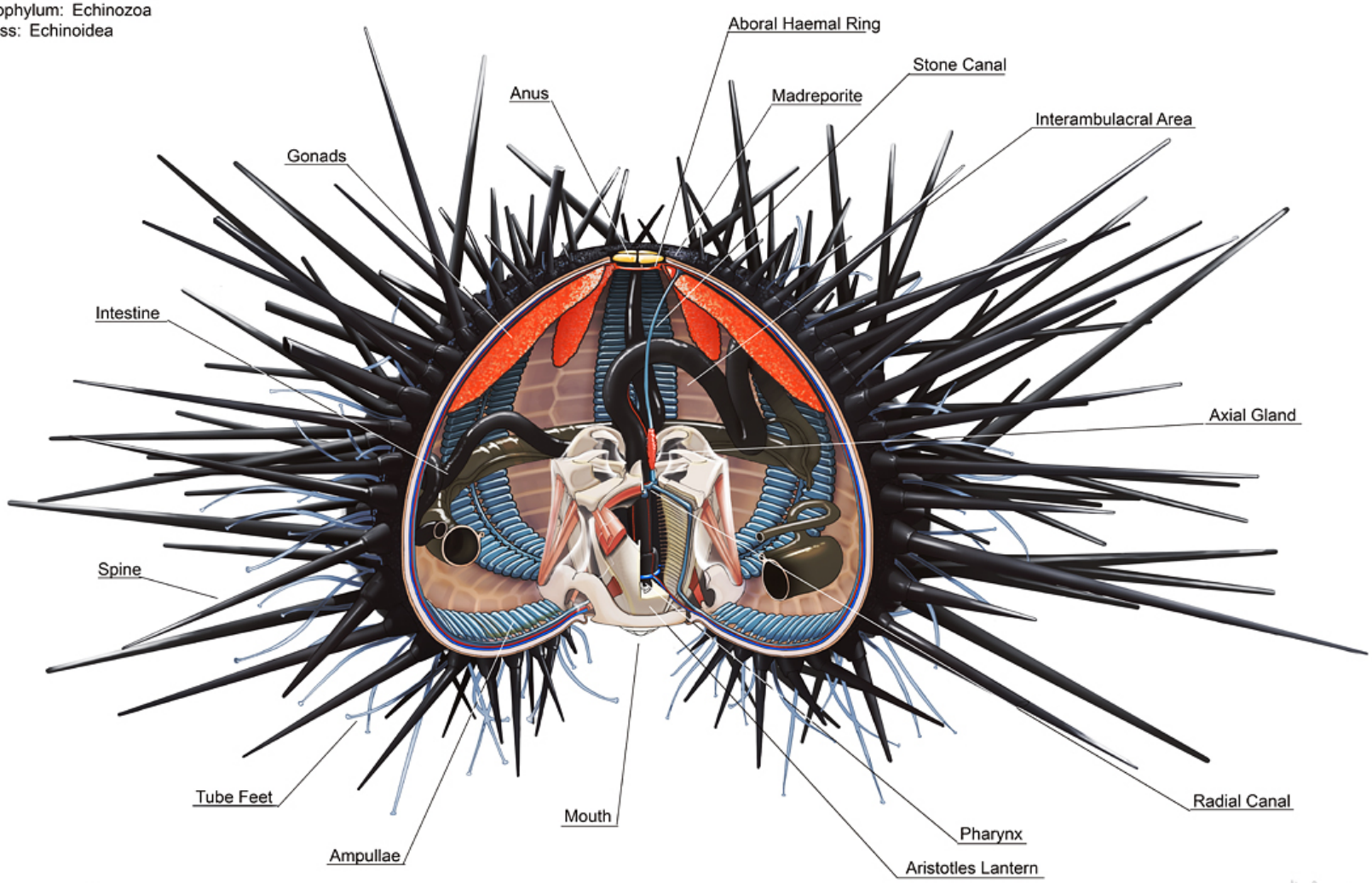
Sea Urchin Anatomy

Generalised Anatomy based on *Arbacia*

Kingdom: Animalia
Phylum: Echinodermata
Subphylum: Echinozoa
Class: Echinoidea



alexries.com 2011

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Ascaris

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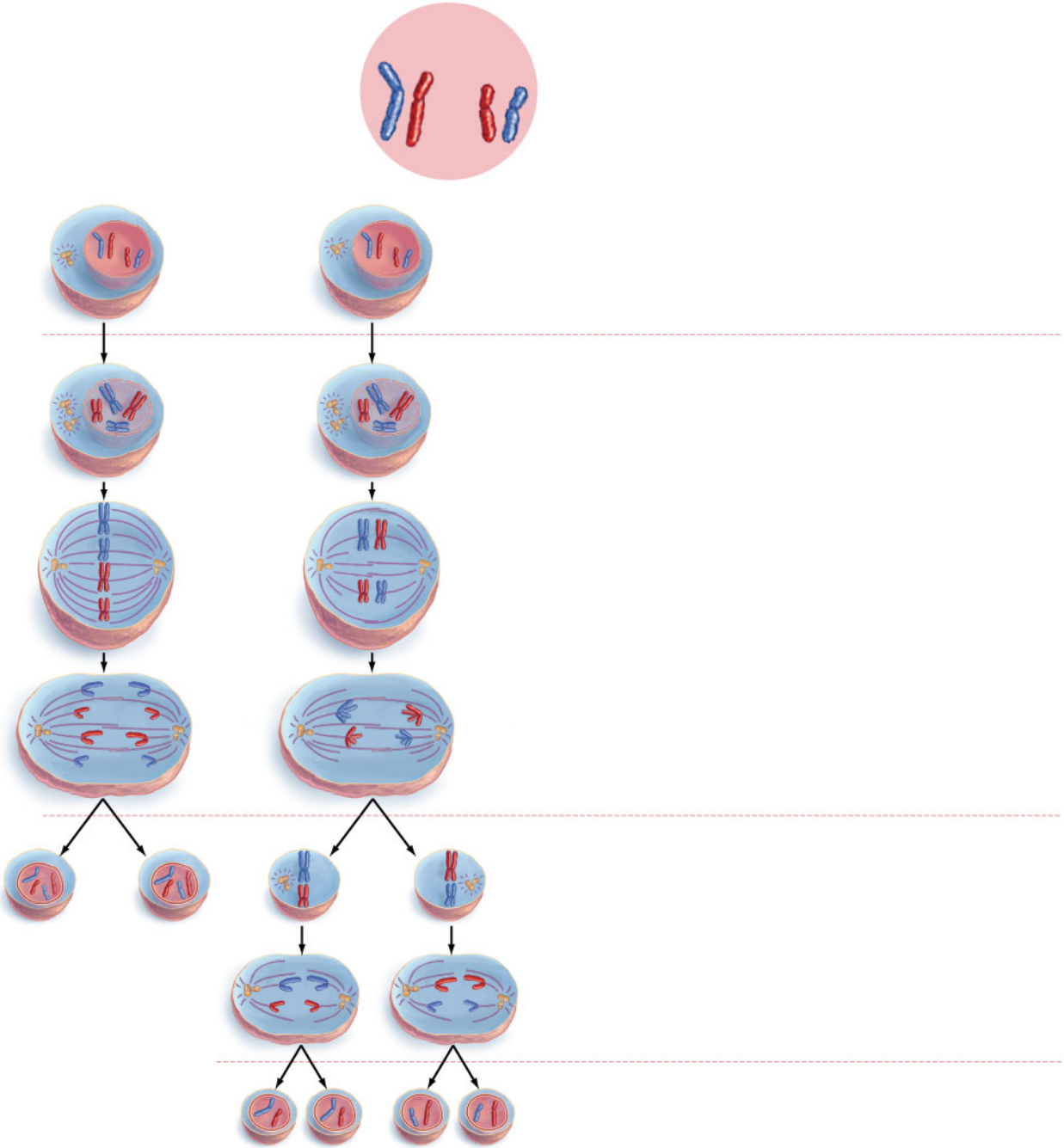
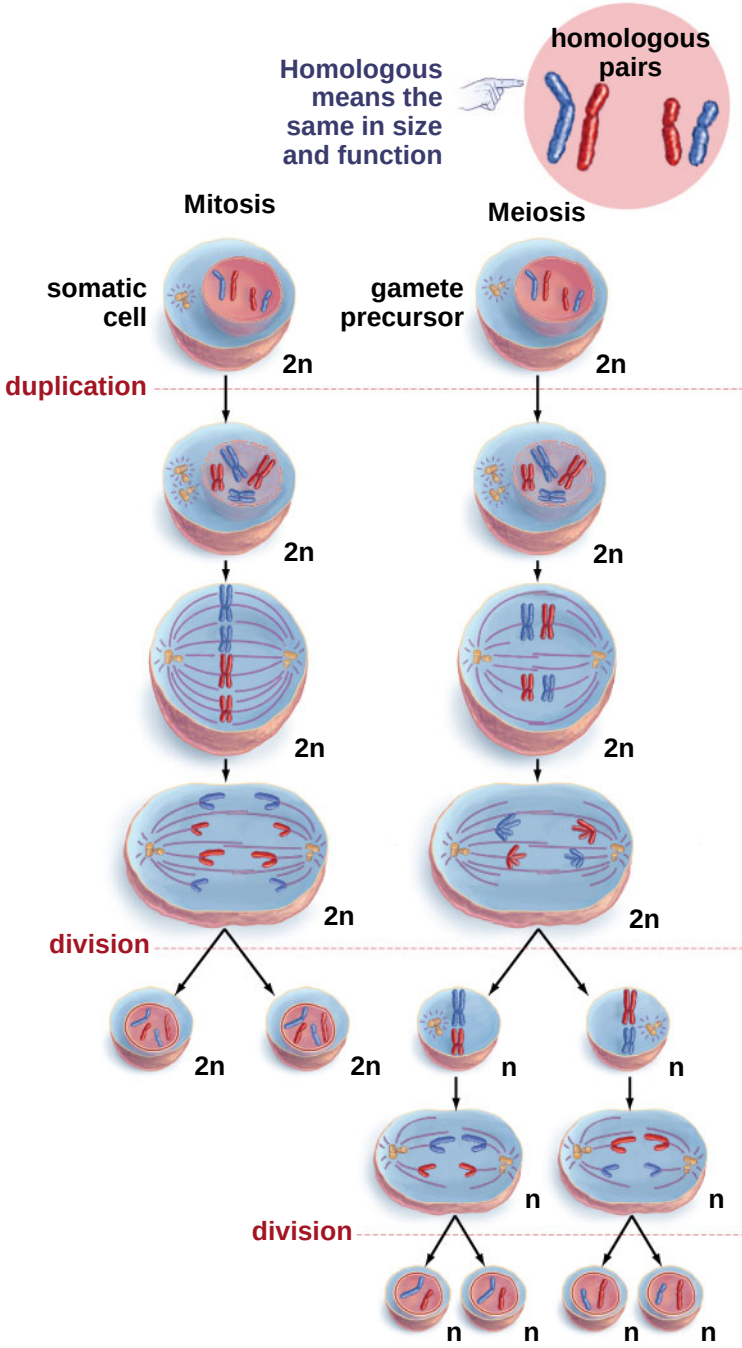
1. Why don’t people give birth to chickens or cats?
2. How many kids could your parents have before two were exactly the same?





1. Both mitosis and meiosis are initiated in cells that are diploid or "2n," meaning cells that contain paired sets of chromosomes. The members of each pair are homologous—the same in size and function. Two pairs of homologous chromosomes are shown within the cells in both the mitosis and meiosis figures. In each homologous pair, one chromosome (in red) comes from the mother of the person whose cell is undergoing meiosis, while the other chromosome (in blue) comes from the father of this person.

duplication

2. Prior to the initiation of both mitosis and meiosis, the chromosomes duplicate. In both processes, each chromosome is now composed of two sister chromatids.

3. In mitosis, the chromosomes line up on the metaphase plate, one sister chromatid on each side of the plate. In meiosis, homologous chromosomes—not sister chromatids—line up on opposite sides of the metaphase plate.

4. In mitosis, the sister chromatids separate. In meiosis, the homologous pairs of chromosomes separate.

division

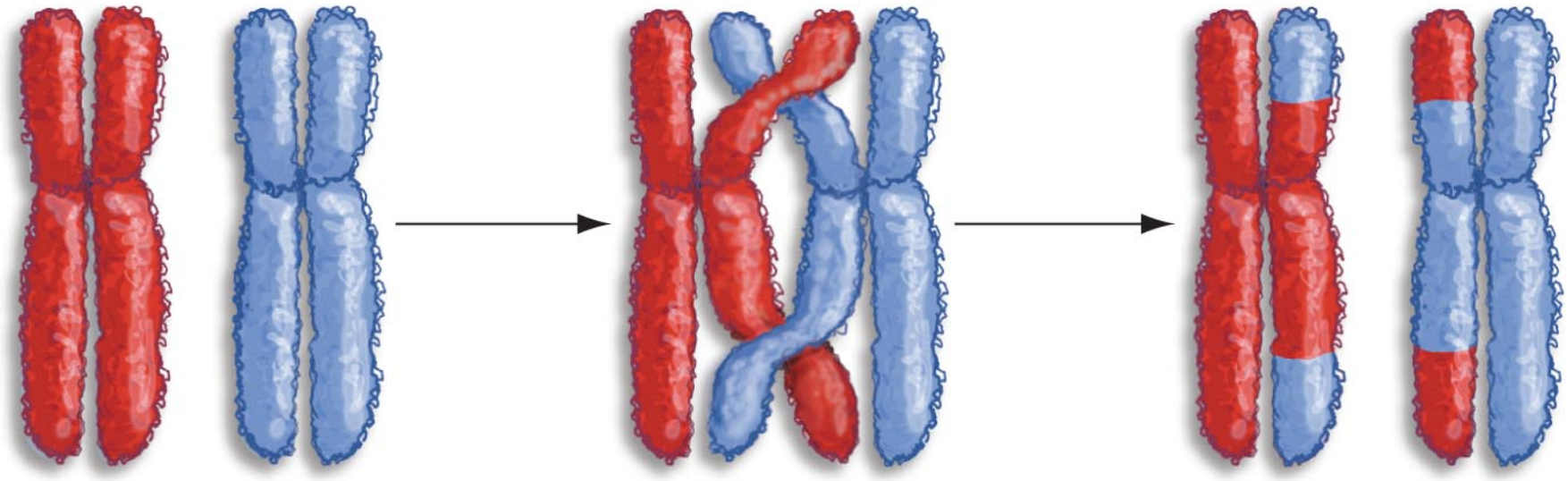
5. In mitosis, cell division takes place, and each of the sister chromatids from step 4 is now a full-fledged chromosome. Mitosis is finished. In meiosis, one member of each homologous pair has gone to one cell, the other member to the other cell. Because each of these cells now has only a single set of chromosomes, each is in the haploid or "n" state. Next, these single chromosomes line up on the metaphase plate, with their sister chromatids on opposite sides of the plate.

6. The sister chromatids of each chromosome then separate.

division

7. The cells divide again, yielding four haploid cells.

Figure 10.1



The Steps of Meiosis

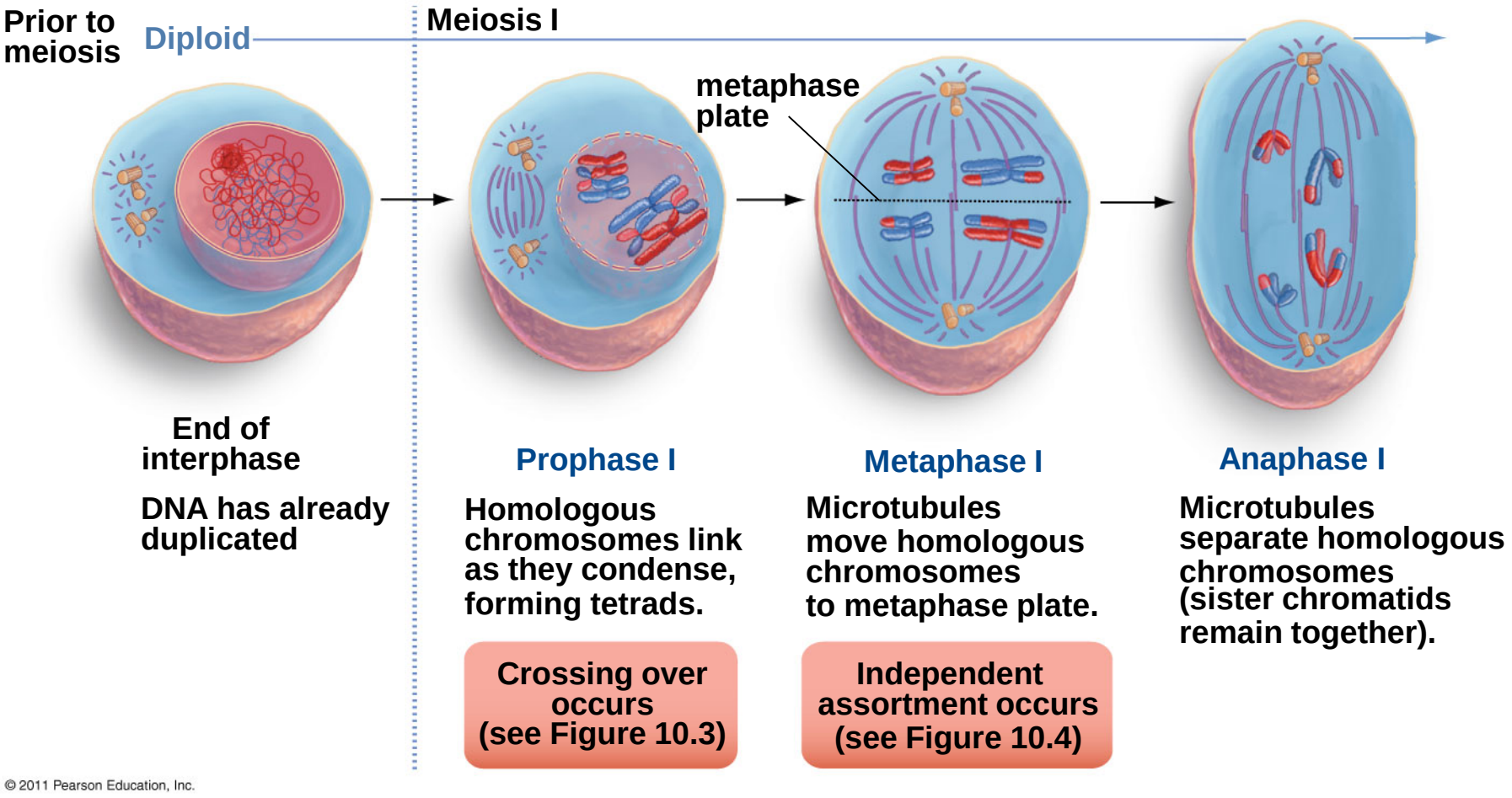


Figure 10.2

The Steps of Meiosis

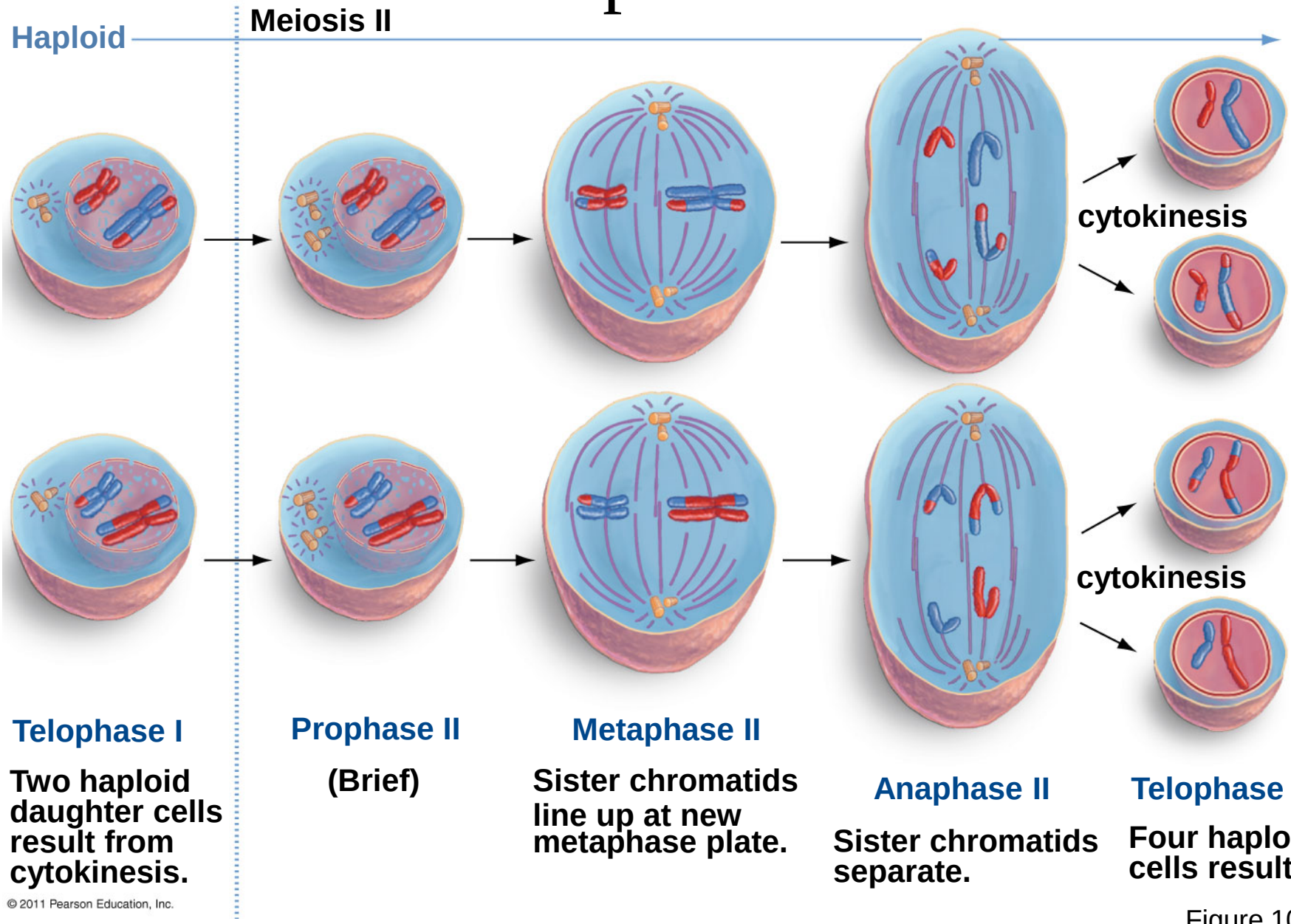


Figure 10.2

The X and the Y

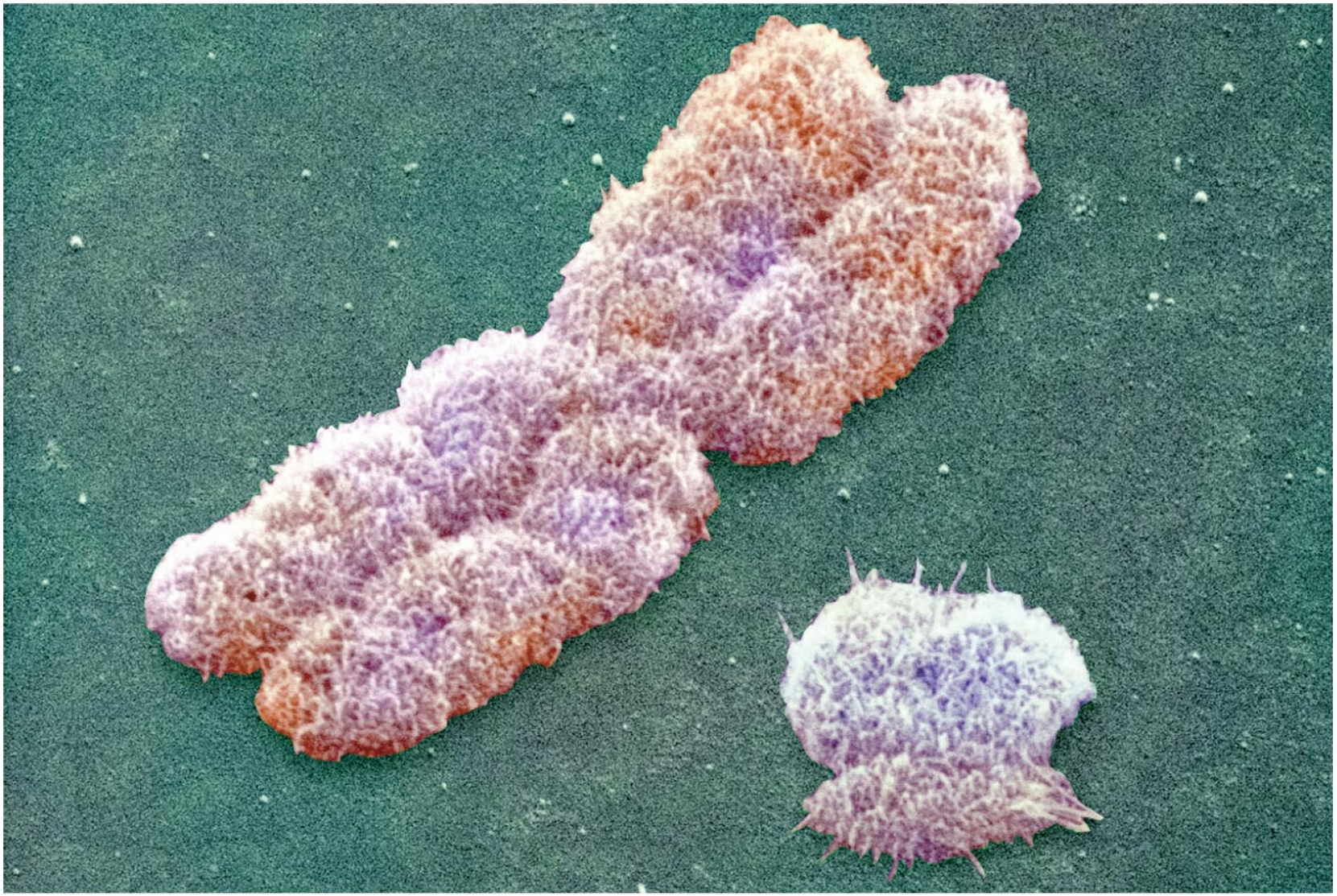
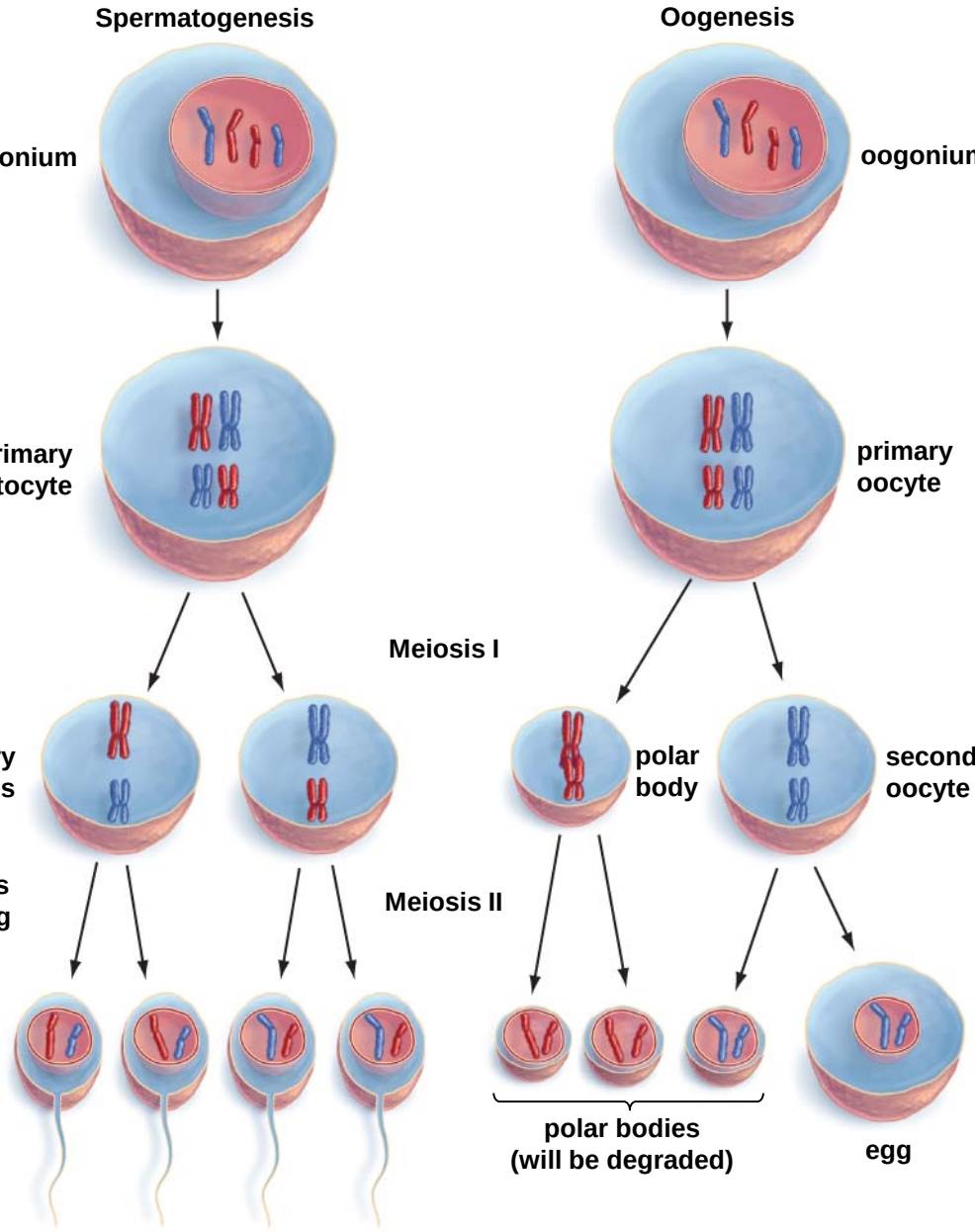


Figure 10.6

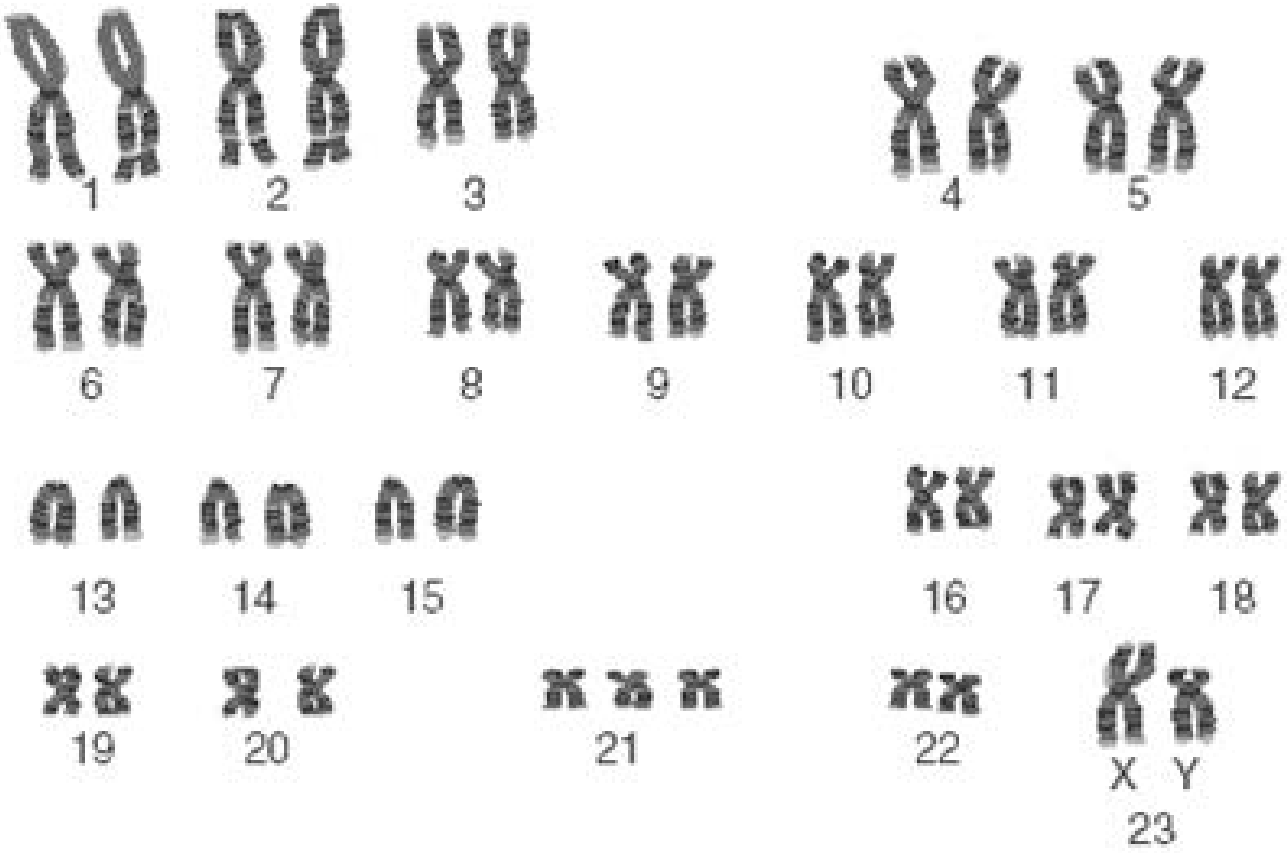
Sperm and Egg Formation in Humans



1. The diploid spermatogonium cell produces a primary spermatocyte.
2. The primary spermatocyte goes through meiosis I, yielding two haploid secondary spermatocytes.
3. The secondary spermatocytes go through meiosis II, yielding four haploid spermatids, which will develop into mature sperm cells.

1. Before the birth of the female, a cell called an oogonium develops into a primary oocyte; this cell enters meiosis I, but remains there until it matures in the female ovary, beginning at puberty.
2. On average, one primary oocyte per month will complete meiosis I. In this process, an unequal meiotic division of cellular material leads to the production of one polar body and one secondary oocyte, which enters into meiosis II.
3. Only secondary oocytes that are fertilized by sperm will complete meiosis II and develop into an egg. The three polar bodies that are produced by meiosis I and II will be degraded.

Figure 10.8



Down Syndrome

Characteristics	Percentage	Characteristics	Percentage
Mental impairment	99%[21]	Abnormal teeth	60%[22]
Stunted growth	90%[23]	Slanted eyes	60%[4]
Umbilical hernia	90%[24]	Shortened hands	60%[22]
Increased skin back of neck	80%[18]	Short neck	60%[22]
Low muscle tone	80%[25]	Obstructive sleep apnea	60%[18]
Narrow roof of mouth	76%[22]	Bent fifth finger tip	57%[4]
Flat head	75%[4]	Brushfield spots in the iris	56%[4]
Flexible ligaments	75%[4]	Single transverse palmar crease	53%[4]
Proportionally large tongue[26]	75%[25]	Protruding tongue	47%[22]
Abnormal outer ears	70%[18]	Congenital heart disease	40%[22]
Flattened nose	68%[4]	Strabismus	~35%[2]
Separation of first and second toes	68%[22]	Undescended testicles	20%[27]

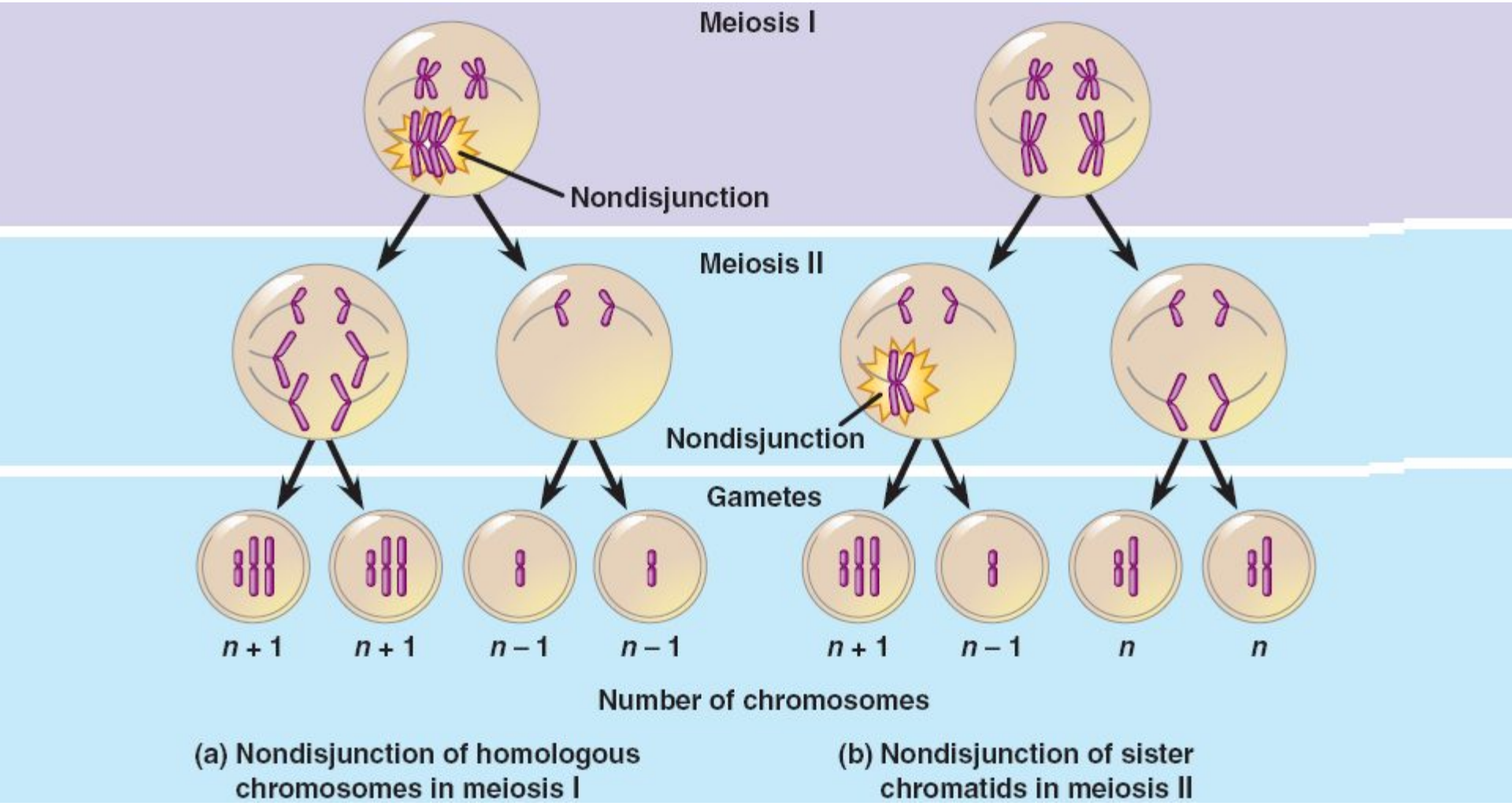
8-year-old boy with Down syndrome

Feet of boy with Down syndrome

Eyes of newborn, showing Brushfield spots in iris

Wikipedia.com

Nondisjunction



Regeneration

Figure 10.11