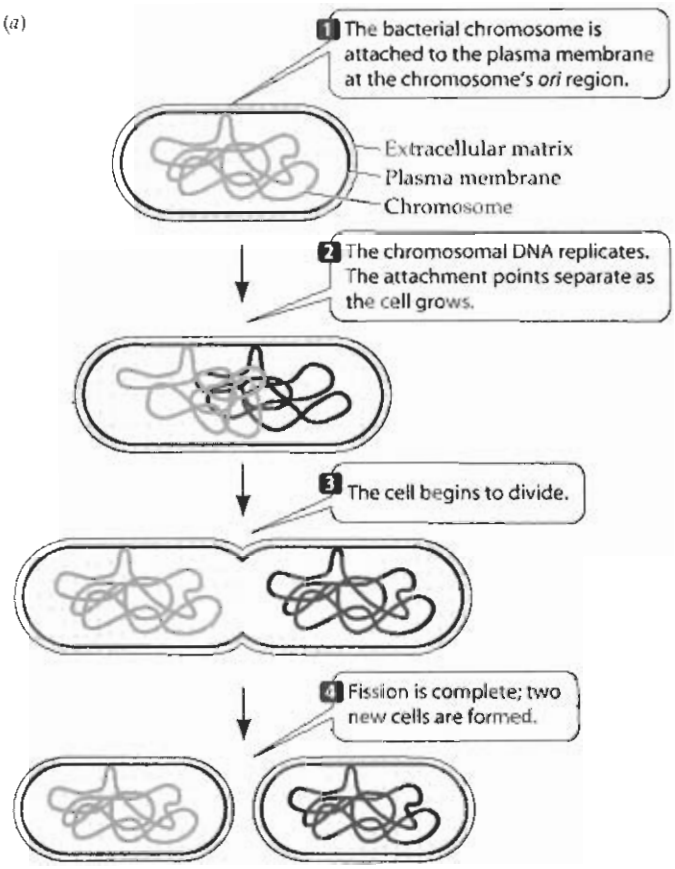
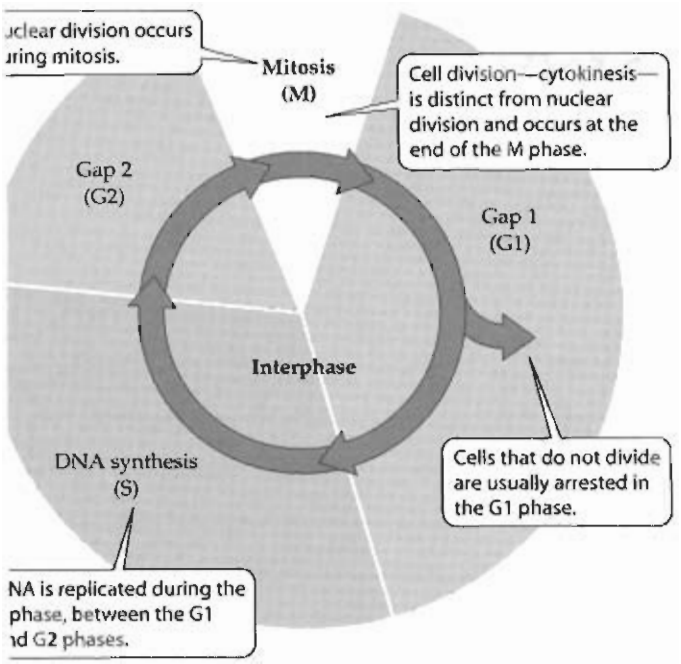
9 Chromosomes, the Cell Cycle, and Cell Division

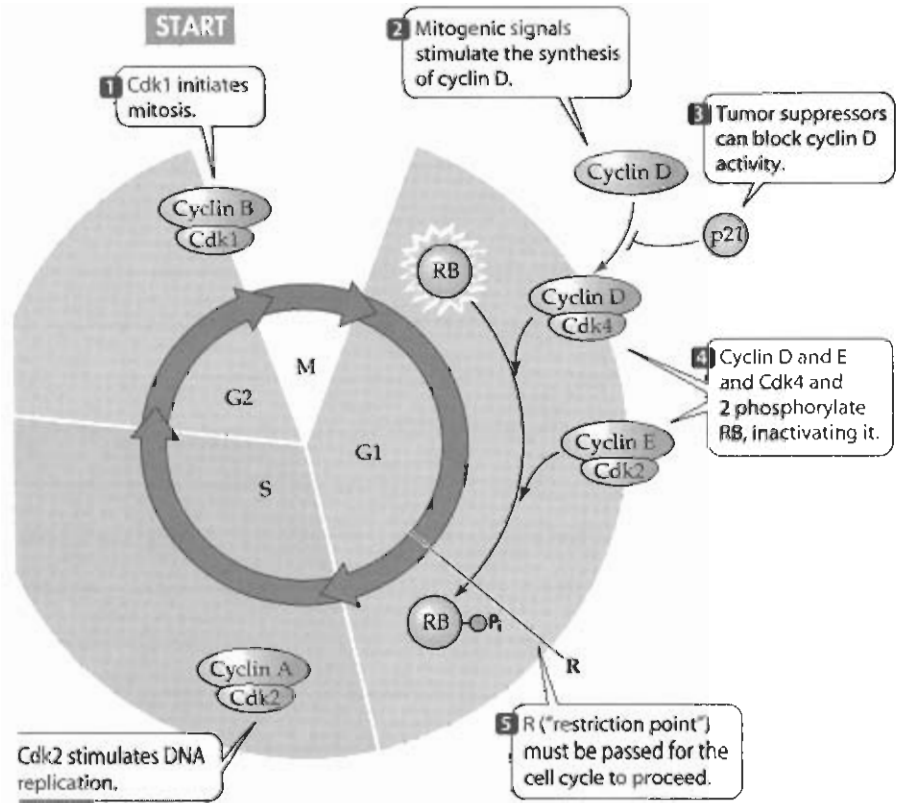
(a)



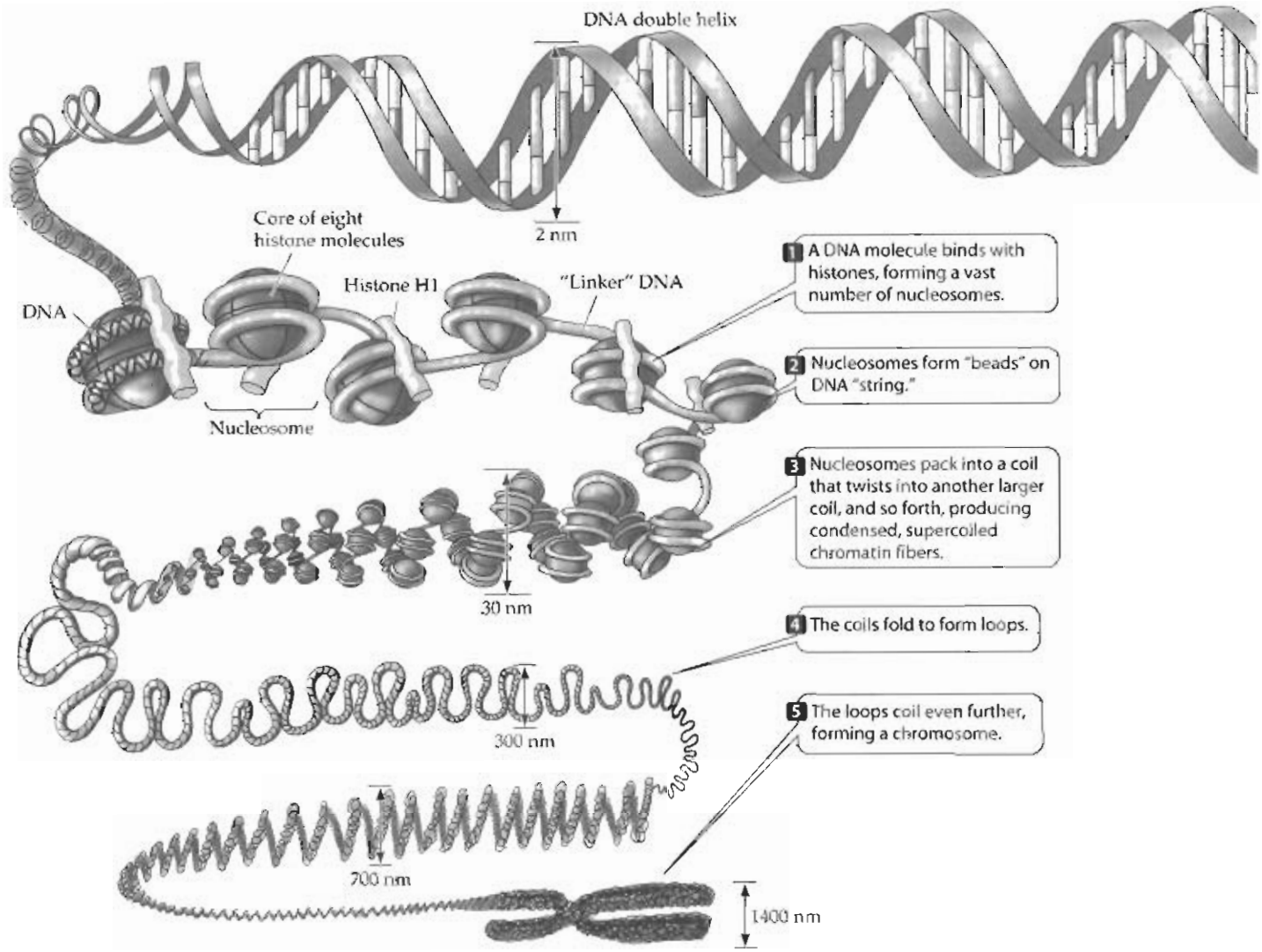
9.2 Prokaryotic Cell Division *(Page 166)*



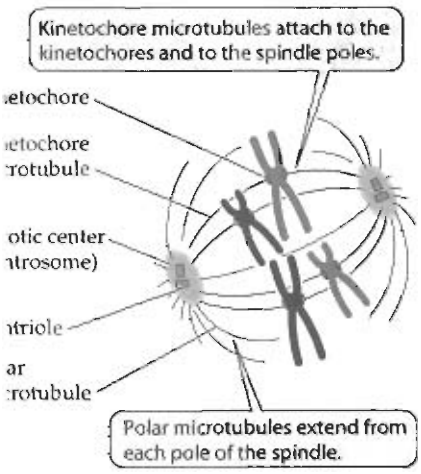
The Eukaryotic Cell Cycle *(Page 167)*



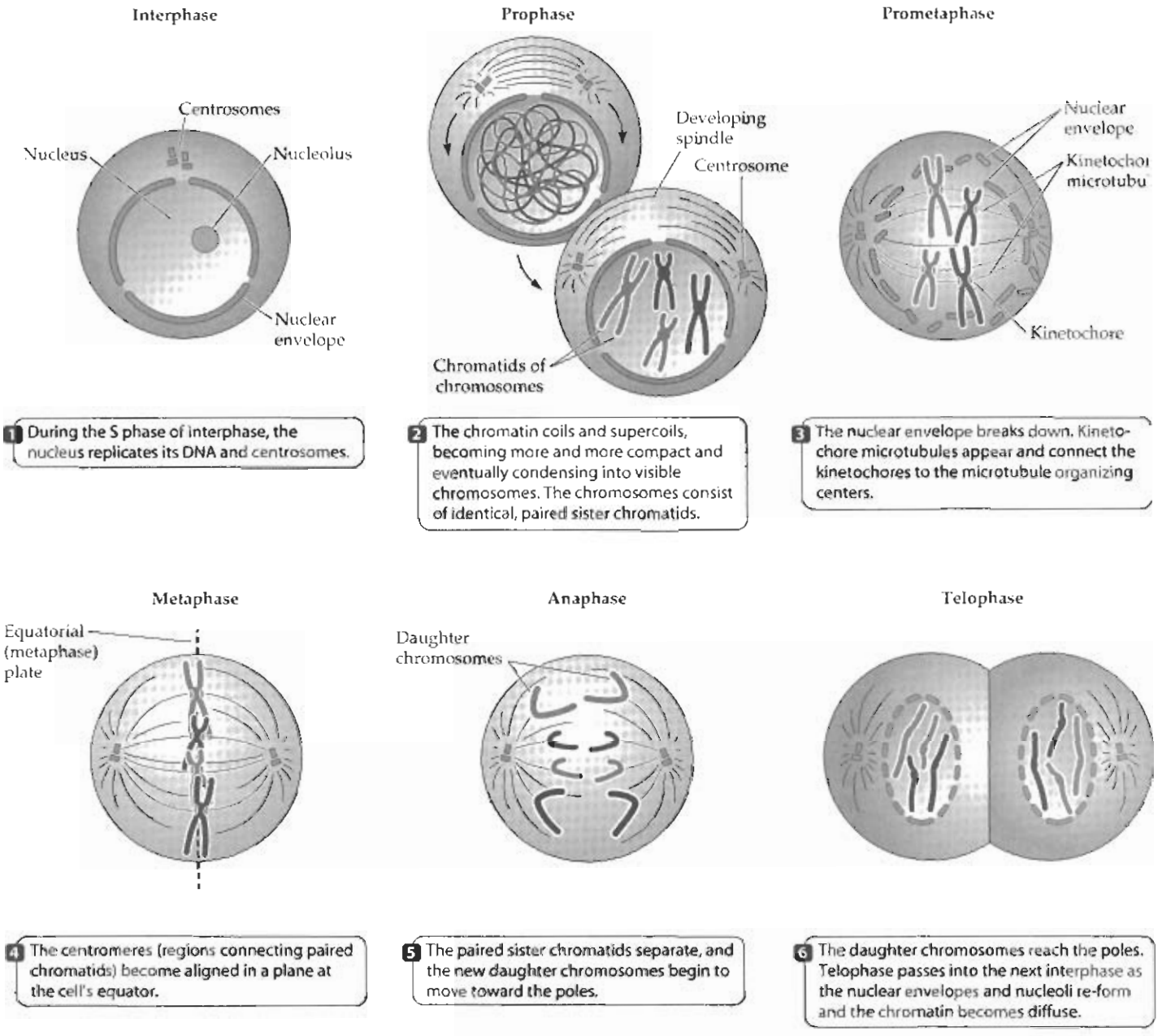
Cyclin-Dependent Kinases and Cyclins Trigger Transitions in the Cell Cycle *(Page 168)*



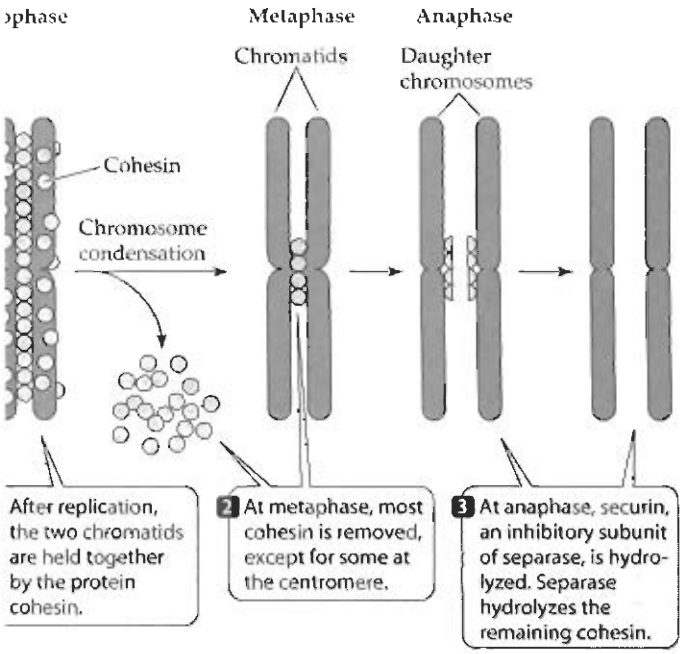
9.6 DNA Packs into a Mitotic Chromosome *(Page 170)*



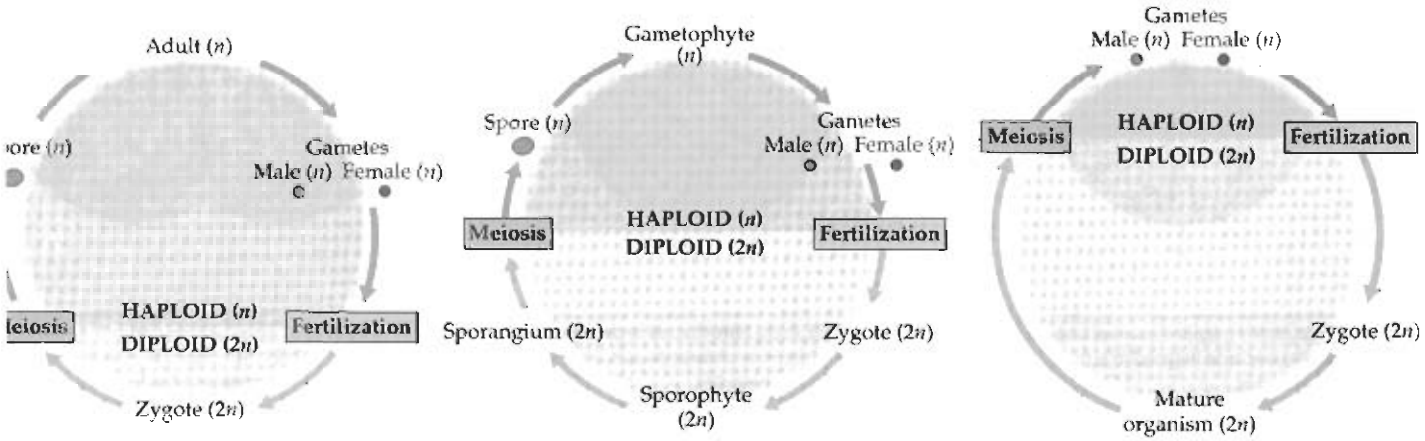
The Mitotic Spindle Consists of Microtubules *(Page 171)*



9.8 Mitosis *(Pages 172–173)*



) Molecular Biology of Chromatid Attachment and Separation
ıge 173)



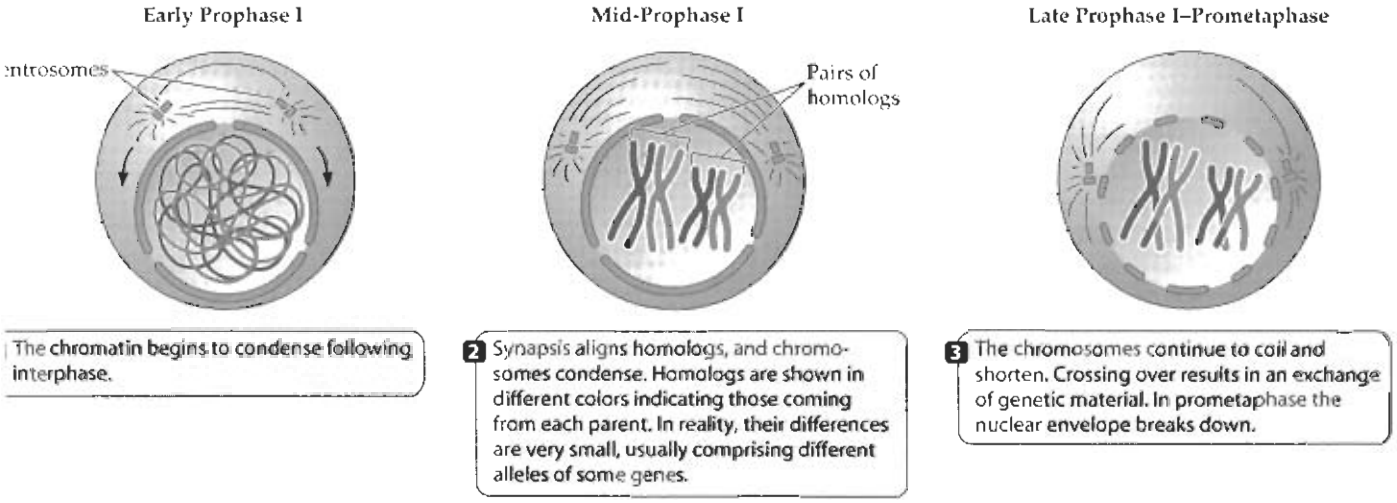
2 Fertilization and Meiosis Alternate in Sexual Reproduction *(Page 176)*

9.1 Numbers of Pairs of Chromosomes in Some Plant and Animal Species

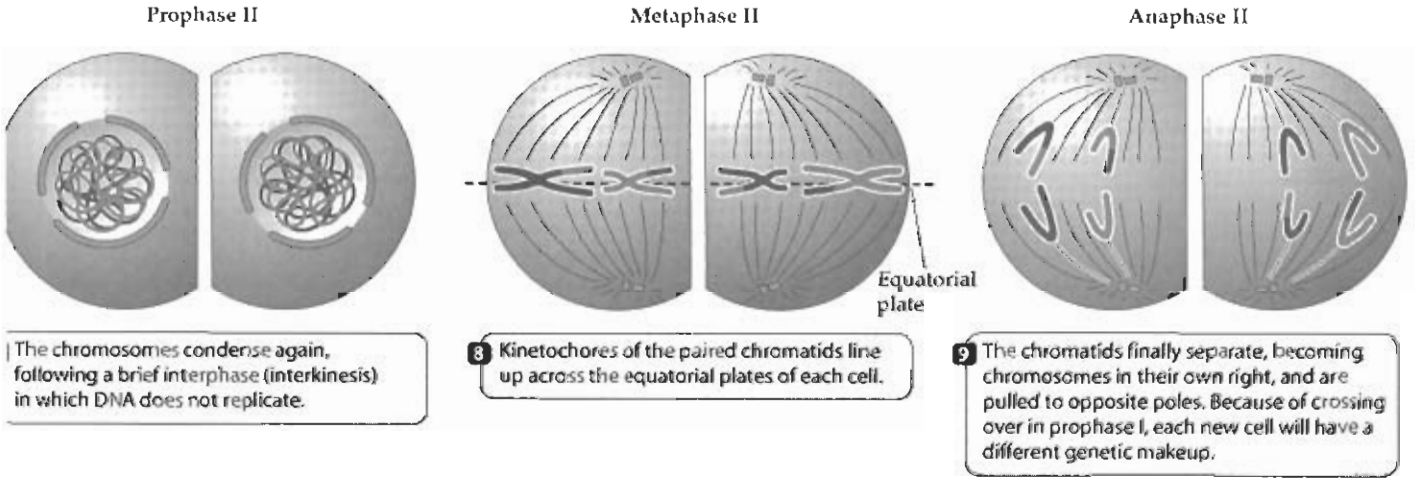
COMMON NAME	SPECIES	NUMBER OF CHROMOSOME PAIRS
Mosquito	*Culex pipiens*	3
Housefly	*Musca domestica*	6
Toad	*Bufo americanus*	11
Rice	*Oryza sativa*	12
Frog	*Rana pipiens*	13
Alligator	*Alligator mississippiensis*	16
Rhesus monkey	*Macaca mulatta*	21
Wheat	*Triticum aestivum*	21
Human	*Homo sapiens*	23
Potato	*Solanum tuberosum*	24
Donkey	*Equus asinus*	31
Horse	*Equus caballus*	32
Dog	*Canis familiaris*	39
Carp	*Cyprinus carpio*	52

(Page 177)

EIOSIS I

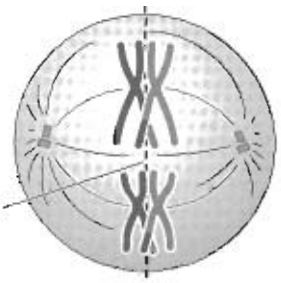


EIOSIS II



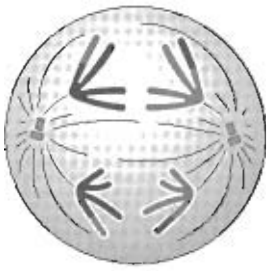
14 Meiosis *(Pages 178–179)*

Metaphase I



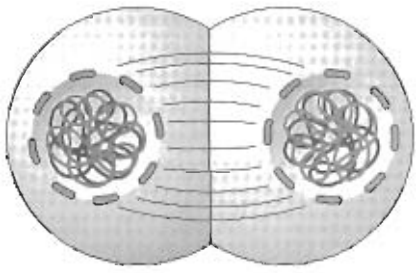
4 The homologous chromosomes line up on the equatorial (metaphase) plate.

Anaphase I



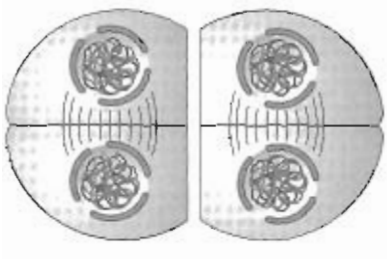
5 The homologous chromosomes (each with two chromatids) move to opposite poles of the cell.

Telophase I



6 The chromosomes gather into nuclei, and the original cell divides.

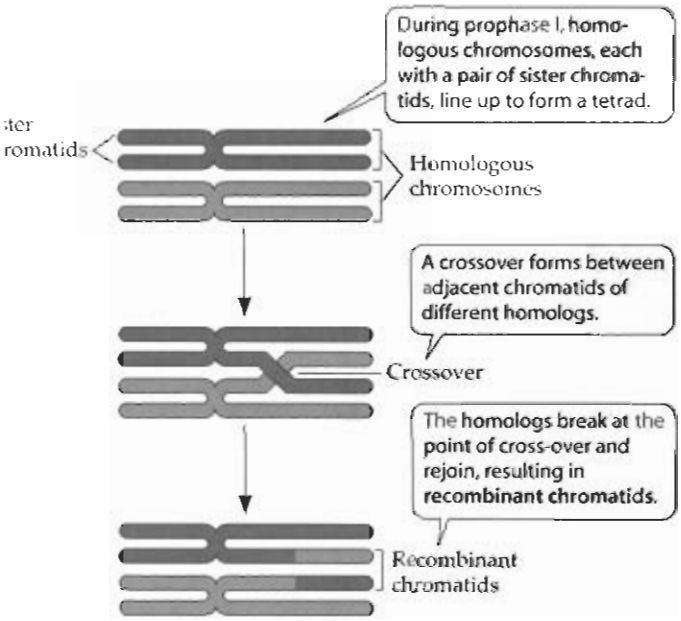
Telophase II



10 The chromosomes gather into nuclei, and the cells divide.

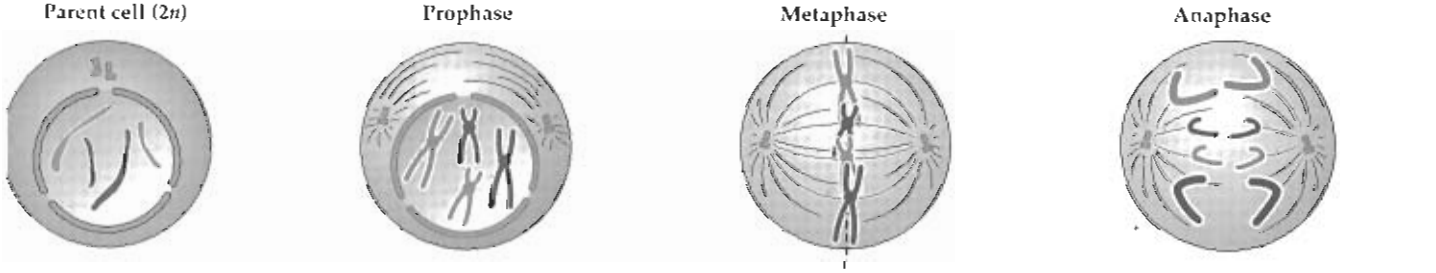
Products

11 Each of the four cells has a nucleus with a haploid number of chromosomes.

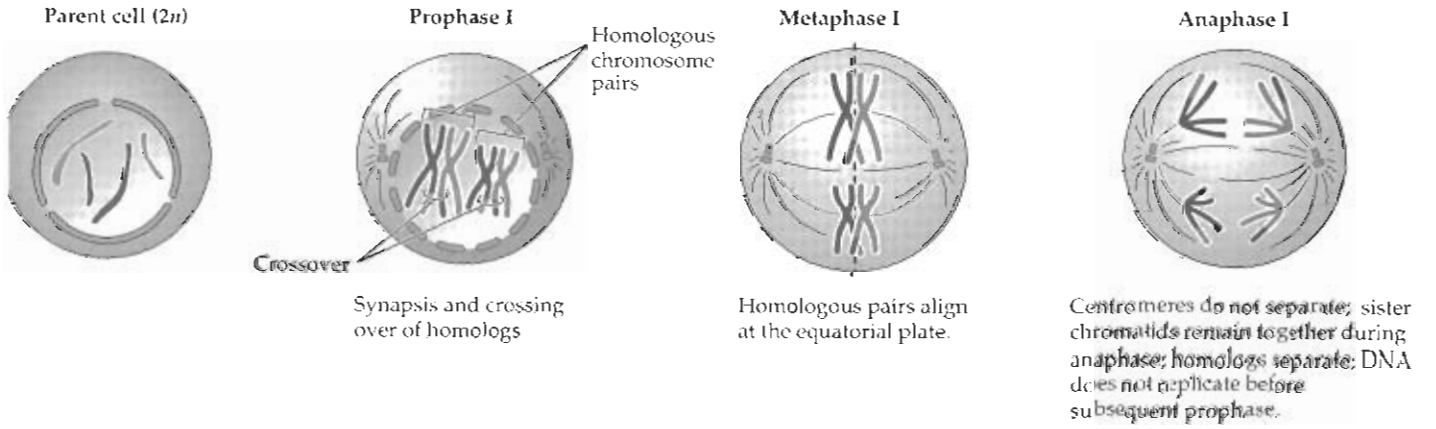


16 Crossing Over Forms Genetically Diverse Chromosomes
age 180)

ITOSIS

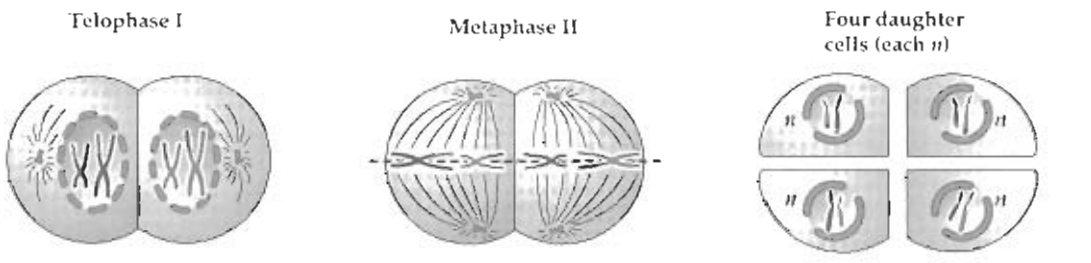


EIOSIS

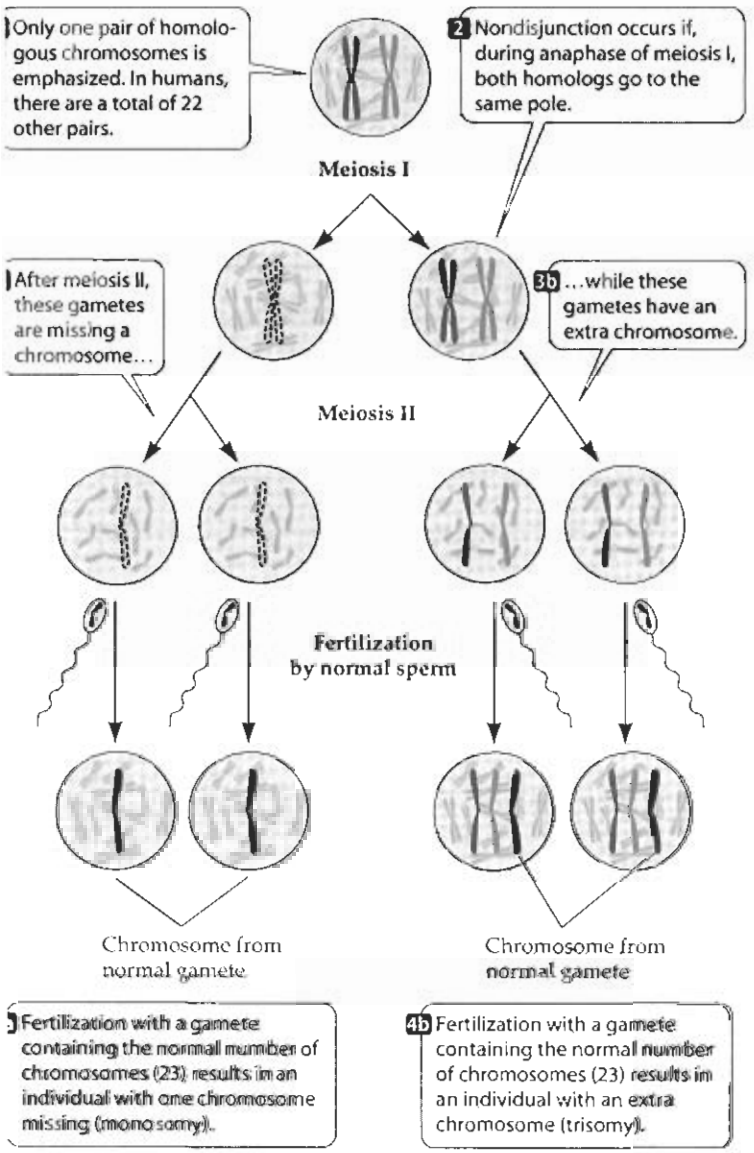


17 Mitosis and Meiosis: A Comparison *(Pages 182-183)*

Mitosis is a mechanism for constancy: The parent nucleus produces two identical daughter nuclei.



Meiosis is a mechanism for diversity: The parent nucleus produces four different haploid daughter nuclei.



18 Nondisjunction Leads to Aneuploidy *(Page 183)*

.2 *Two Different Ways for Cells to Die*

	NECROSIS	APOPTOSIS
timuli	Low O_2, toxins, ATP depletion, damage	Specific, genetically programmed physiological signals
TP required	No	Yes
ellular pattern	Swelling, organelle disruption, tissue death	Chromatin condensation, membrane blebbing, single-cell death
NA breakdown	Random fragments	Nucleosome-sized fragments
lasma membrane	Burst	Blebbed (see Figure 9.19)
ate of dead cells	Ingested by phagocytes	Ingested by neighboring cells
eaction in tissue	Inflammation	No inflammation

ıge 184)