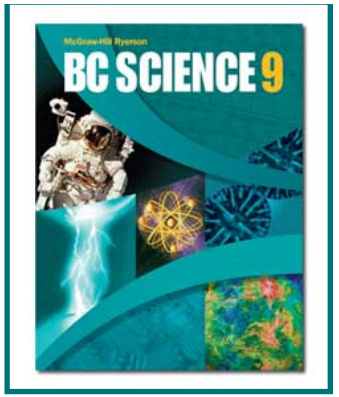
**These notes are posted on my site for the following reasons:**

- **for students to copy in their own hand-writing**
  - **in order to complete their class notes**
  - **if student did not have enough time in class**
  - **if student was away and missed this section**
- **for assistants and tutors to follow progress of the concepts taught**

**Photocopied/printed notes can not be used during the Unit Notebook Check in class.**

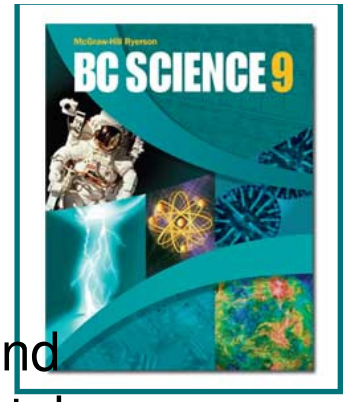
**ndupuis@sd61.bc.ca dupuis.shawbiz.ca**

# 6.1 Meiosis




- Meiosis is an important aspect of **sexual reproduction**
- Sexual reproduction, through the shuffling of DNA, produces genetic diversity.
- This variation offspring produces individuals that may have advantages over one another.

See pages 188 - 189

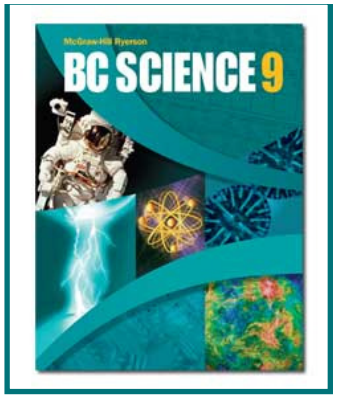



# Role of Gametes

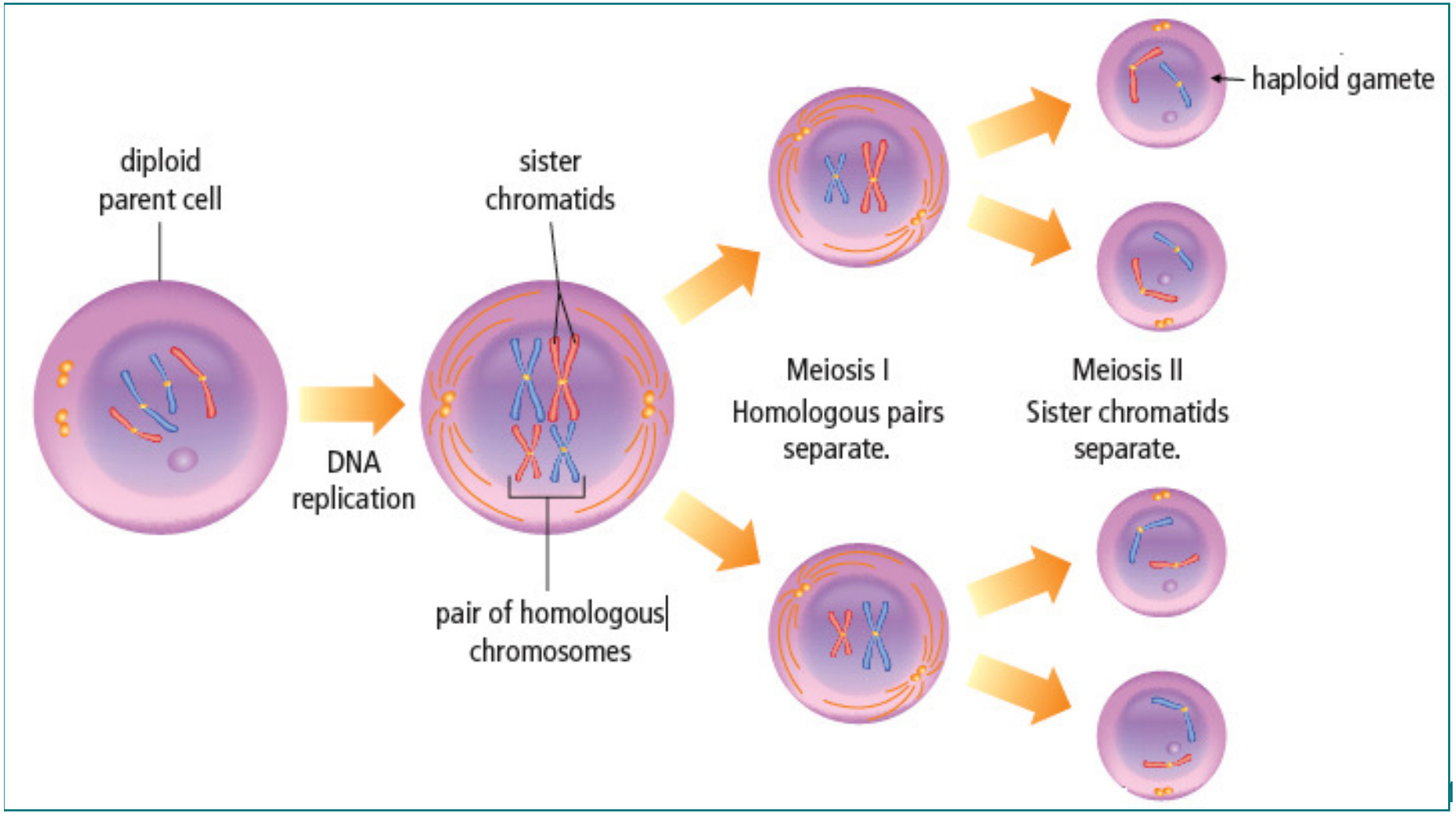
- Normal body cells have a **diploid** chromosome number, meaning chromosomes occur in pairs. In humans, the male and female each contribute 23 chromosomes - when **fertilization** takes place, 23 (egg) + 23 (sperm) = 46 (zygote)
- The zygote goes on to develop into an embryo, and on into a complete individual. When the time comes, the cycle repeats - humans produce **gametes** (either egg or sperm) that have half (**haploid**) the normal number of chromosomes.


See page 190

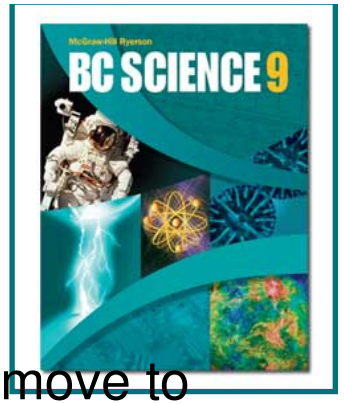
# Meiosis




- Meiosis produces gametes with half the chromosomes compared to body cells: [copy and caption figure 6.4 page 191]



# Meiosis Events




**Meiosis I**

- Matching chromosome pairs (homologous chromosomes) move to opposite poles of the cell - two daughter cells result.

**Meiosis II**

- Chromatids of each chromosome are pulled apart - the end result is four haploid cells, each with half the number of chromosomes. These develop into gametes.

**Crossing Over**

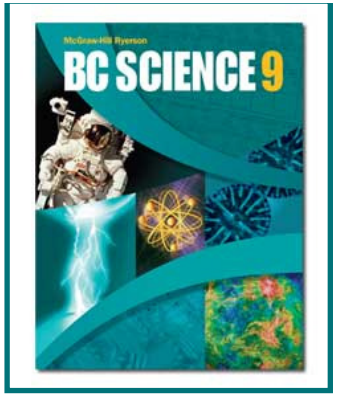
- In meiosis I, chromatids of chromosome pairs can cross over each other and exchange DNA segments - this increases genetic possibilities and produces more variation

**Independent Assortment**

- The pairs of chromosomes in meiosis I separate independently, creating many different combinations of chromosomes in the daughter cells

See pages 191 - 193

# Meiosis Details




**Gametes do not form equally in males and females**

- In males, all 4 cells from meiosis develop into sperm.
- In females, 1 cell becomes the egg.

**Chromosome mutations sometimes occur spontaneously**

- Chromosome changes during meiosis can cause changes in the genetic information. Parts of chromosomes can be **inverted, deleted, duplicated or moved** to another spot.

**Chromosome mutations can occur because of mutagens**

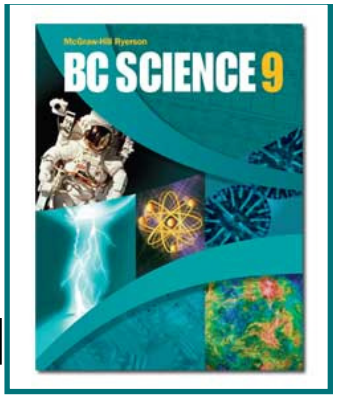
- Chromosome changes, sometimes leading to genetic disease or death, can be cause by mutagens such as radiation or chemicals.

**Failed separation of chromosomes in meiosis has serious consequences**

- Failed separation means that a gamete may end up with no chromosome or too many of a chromosome. These zygotes rarely survive, and if they do, they will have serious genetic disorders.

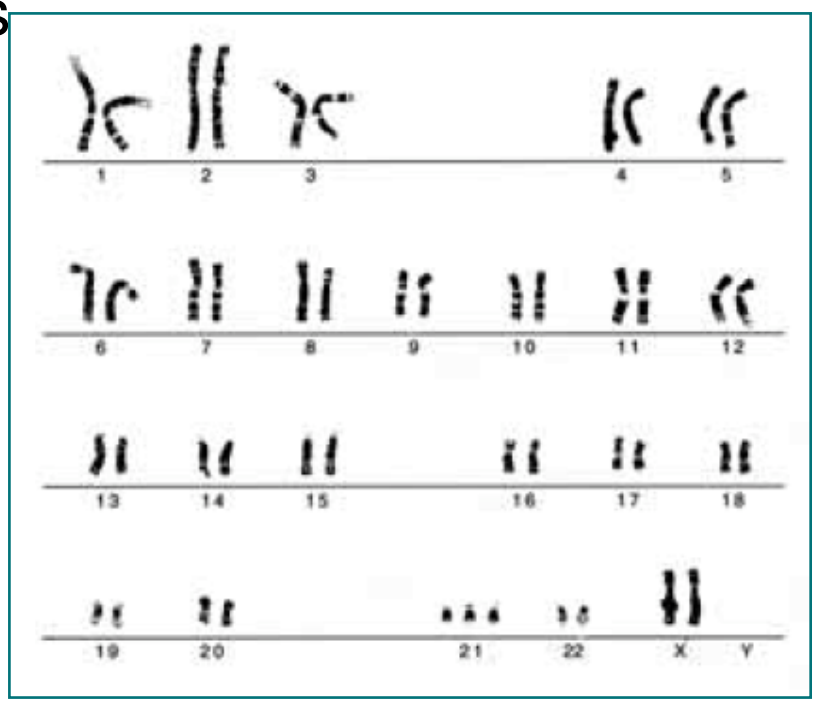
See pages 194 - 195

# Genetic Disorders




**The chromosomes of an individual can be studied**

- By using a karyotype, geneticists can view one's chromosomes.
- Certain genetic disorders or syndromes occur when there are specific chromosomes extra or missing
- Down syndrome usually occurs when there is an extra 21st chromosome




Down syndrome karyotype

Take the Section 6.1 Quiz

See pages 196 - 197