Unit 1: General properties and types of cells

This topic provides a general introduction to cells as the basic unit of life, their structure, diversity and the evolutionary relationship of all living organisms.

Pre-reading Assignment:

Be sure to check out the Learning Objective for this Unit and Topic. These can be found on the Canvas site at the top of the Unit schedule.

This document contains all the information you need to complete your pre-class reading assignment for this topic.

The table below lists the overall chapters and sections of the textbook you will need to refer to.

Pre-Reading Assignment *See your Targeted reading for details…*	Topic
Chapter 5: Introduction	Cell diversity, the Cell theory
Chapter 1: Introduction, section 1.3, 1.4	The cell, Tree of Life
Chapter 5: section 5.3	Internal organization of cells
Chapter 24: section 24.1	Bacteria, cell size limits
Chapter 25: section 25.1	Eukaryotic cell

Targeted Reading:

The targeted reading is created to specifically guide your reading – directing your attention (***Focus***) to the content that will help you meet the learning objectives. For example, not every paragraph in a chapter section is required reading. This document will tell you when you could ***Skip*** a paragraph/subtopic to save you time!

1. Chapter 5

- **Introduction –** pages 92-93

  Focus Cell theory, explain how the cell theory can be used to explain where cells come from.

2. Chapter 1:

- **Section 1.3 –** pages 11-14

Introduction and Figures 1.10 and 1.11.

Focus Key features to be considered about cells include: diversity in cell size, structures; cells as organisms *versus* cells in organisms; unicellular versus multicellular.

Skip Figures 1.9 (Sections titled "How do we know?" optional reading)

Subtopic: *Nucleic acids store and transmit information*

Focus The central dogma of molecular biology.

Terminology alert Replication, transcription, translation, central dogma.

Subtopic: *Membranes define cells and spaces within cells*
Focus The purpose of cellular membranes; the similarities and differences in the function/purpose of cellular membranes in bacteria compared to eukaryotes.
In paragraphs 4, 5 & 6 – Be familiar with the three domains of life, multi-cellular *vs*. unicellular.

Subtopic: *Metabolism converts energy from the environment into a form that can be used by cells.*
Focus Harnessing energy from the environment and conversion to a form cells can use.

- **Section 1.4 –** page 17
  Only Fig. 1.17 The tree of life: What are the three domains in the tree of life?

3. Chapter 5:

- **Section 5.3 –** pages 104-107 **(read all)**
  - Fig. 5.16 Note the similarities and differences between a bacterial cell and a eukaryotic cell. For more detail, compare Figure 5.17 and Figure 24.1 in Chapter 24.

Terminology alert Nucleus, nucleoid, plasma/cell membrane, cell wall, organelles (mitochondria, chloroplasts).

4. Chapter 24:

- **Section 24.1 Two Prokaryotic Domains –** page 519-521
  Subtopic: *Bacterial cells are small but powerful.*
  Focus Compare and contrast structural features of bacterial cells to eukaryotic cells.

  Subtopic: *Diffusion limits cell size in bacteria.*
  Focus Think about why bacteria cells are small compared to eukaryotic cells.

Chapter 25:

- **Section 25.1 A review of the Eukaryotic Cell –** page 545 - 549
  Focus Familarize yourself with the structural features of eukaryotic cells and compare to bacterial cells with respect to overall features, metabolism, gene organization and reproduction. There features will be drawn attention to in-class as we compare these two organisms.

Making Connections

Here are some connections you need to be making to concepts you've encountered already, or that you will encounter in the future:

Think about and list features that are common among all cell types.

How are they different?

What dictates the diversity of different types of cells?