Adult Basic Education

Science

Biology 2101A

The Cell

Study Guide

Credit Value: 1

Text: *Biology*. Bullard, Chetty, et al; McGraw-Hill Ryerson, 2003.

Biology Concentration
Biology 1101
Biology 2101A
Biology 2101B
Biology 2101C
Biology 3101A
Biology 3101B
Biology 3101C

Table of Contents

To the Student

I. Introduction to Biology 2101A

Biology 2101A is a pre-requisite for all remaining Biology courses in the Biology concentration. It covers the proper use of the microscope. It also includes a detailed study of the structure and functioning of both plant and animal cells. Finally, it introduces two of the important chemical processes , photosynthesis and respiration, that occur in cells.

You will have 2 labs for this course. Let your instructor know in advance that you are getting close to needing to do these labs. Each lab will require a written lab report, which will be evaluated as part of your course mark

Biology 2101A is the first of 3 courses (the others are Biology 2101B and Biology 2101C) that are equivalent to Biology 2201 in the current high school program.

To the Student

II. Use of Science Study Guides

Before beginning this course, ensure you have the text and any other resources needed *(see the information in the Introduction to this course for specifics)*.

As you work through the Study Guide, you will see that it is divided according to the Units listed in the Table of Contents. When you open a unit it will have the following components:

Reading for this Unit:
Here you will find the chapters, sections and pages of the text you will use to cover the material for this unit. Skim the sections of the textbook, look at the titles of the sections, scan the figures and read any material in the margins. Once you have this overview of the unit, you are ready to begin. Do not be intimidated by the content. You will work through the text, section by section, gaining knowledge and understanding of the material as you go.

References and Notes	**Work to Submit**
This left hand column guides you through the material to read from the text. Read any highlighted notes that follow the reading instructions. The symbols ▶▶ direct you to the questions that you should complete when finished a reading assignment..	You come across three (3) headings in this right hand column. **Writing:** This section comprises your notes for the unit. Here you will find either written questions or references to specific questions or problems from your text. You may want to write out each question followed by the answer. This material should be checked by your instructor before moving on to the next unit. Mathematical problems should have their solutions checked as you go. **Laboratory:** This section indicates if there is a Core Lab that should be completed for the unit. Let the instructor know in advance that you will be ready for the lab. A lab report should be submitted for each Core Lab. Your instructor will provide guidelines as to how s/he wants the report written. **Assignment:** This section indicates if there is an assignment that should be completed for the Unit. The information in the "References and Notes" column will indicate how you obtain the assignment. These assignments frequently relate the science content to technology, society and the environment.

III. Recommended Evaluation

Written Notes	10%
Labs/Assignments	20%
Test(s)	20%
Final Exam *(entire course)*	50%
	100%

The overall pass mark for the course is 50%.

Unit 1 - The Micro-universe of the Cell

To fulfill the objectives of this unit, students should complete the following:

Reading for this unit: *Biology*

Chapter 1:	Introduction:	page 4
	Section 1.1:	page 6
	Section 1.2:	pages 12 - 22
	Section 1.3:	pages 23 - 34

References and Notes	Work to Submit
Referring to page 6, write answers for 1.1 and 1.2 ▶▶	**Writing:** 1.1 What are the four hypotheses that form the cell theory? 1.2 Explain the difference between biogenesis and abiogenesis.
Read carefully through pages 15 - 19 to complete the Lab ▶▶ ***Note:*** *Consult with your instructor about what is expected for you to submit upon completion of the lab.*	**Laboratory:** 1.3 Complete Investigation 1.A, "Caring for and Using a Microscope".
Based on your work in the lab, write an answer for 1.4 ▶▶	**Writing:** 1.4 Define depth of field and resolution.

Unit 1 - The Micro-universe of the Cell

References and Notes	Work to Submit
Referring to pages 23 - 33, write answers for 1.5 - 1.9 ▶▶	**Writing:** 1.5 Explain the difference between prokaryotic and eukaryotic cells and give an example of each. 1.6 Define organelle. 1.7 Describe the role of the following cellular structures: (i) cell membrane (ii) cytoplasm (iii) nucleus (iv) nucleolus (v) endoplasmic reticulum (vi) ribosome (vii) mitochondria (viii) chloroplast (ix) vacuole (x) vesicle (xi) golgi apparatus (xii) microtubules/filaments (xiii) cilia (xiv) lysosome (xv) flagella (xvi) cell wall 1.8 Label the cell diagrams found in Appendix A. 1.9 Which structures are found in plant cells but not in animal cells?
Note: *Remember that a cell is a fully functional living thing.*	
Note: *Check with your instructor to see if there is an audiotape or videotape available to help you with learning the parts of the cell.*	
Note: *You will need to know how to label the cell diagrams in preparation for your test on this course.*	
See your instructor to see if there is anything else you should do from this unit.	

Unit 2 - Interaction of Cell Structures

To fulfill the objectives of this unit, students should complete the following:

Reading for this unit: *Biology*
Chapter 2: Section 2.2: pages 50 - 61
Section 2.3: pages 62 - 64

References and Notes	Work to Submit
Referring to pages 50 - 58, write answers for 2.1 - 2.5 ▶▶	**Writing:** 2.1 Define homeostasis. 2.2 Explain the term selectively permeable 2.3 Explain the process of diffusion. 2.4 (a) Explain the process of osmosis. (b) What factor determines the direction of osmosis? (c) Define the terms hypotonic, hypertonic and isotonic. 2.5 Explain the difference between active and passive transport.
Referring to pages 56 - 57, complete the lab, "Osmosis in a Model Cell" ▶▶	**Laboratory:** 2.6 Complete Investigation 2.B, "Osmosis in a Model Cell".
Note: *Consult with your instructor about what is expected for you to submit upon completion of the lab.*	

Unit 2 - Interaction of Cell Structures

References and Notes	Work to Submit
Referring to pages 62 - 63, write answers for 2.7 - 2.8 ⏯⏯ ***Note:*** *Make sure you know how to use the term **vesicle** correctly as you work through this section.* *See your instructor to see if there is anything else you should do for this unit.*	**Writing:** 2.7 (a) Define endocytosis. (b) Explain the difference between the 2 main types of endocytosis (pinocytosis and phagocytosis). 2.8 Define exocytosis.

Unit 3 - Photosynthesis and Respiration

To fulfill the objectives of this unit, students should complete the following:

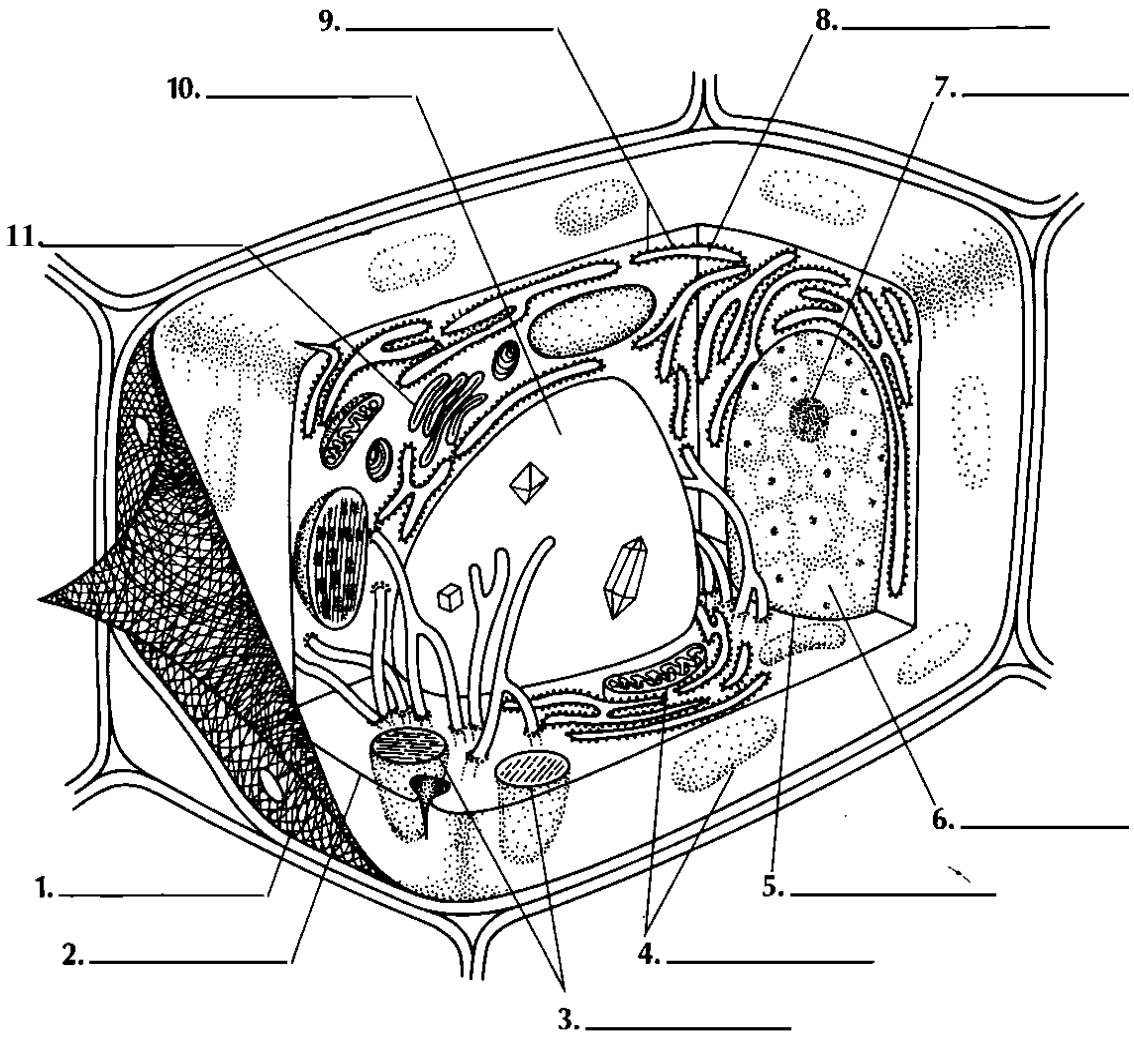
Reading for this unit: *Biology*

Chapter 3:	Introduction:	page 68
	Section 3.1:	page 70
	Section 3.2:	page 73
	Section 3.3:	page 82

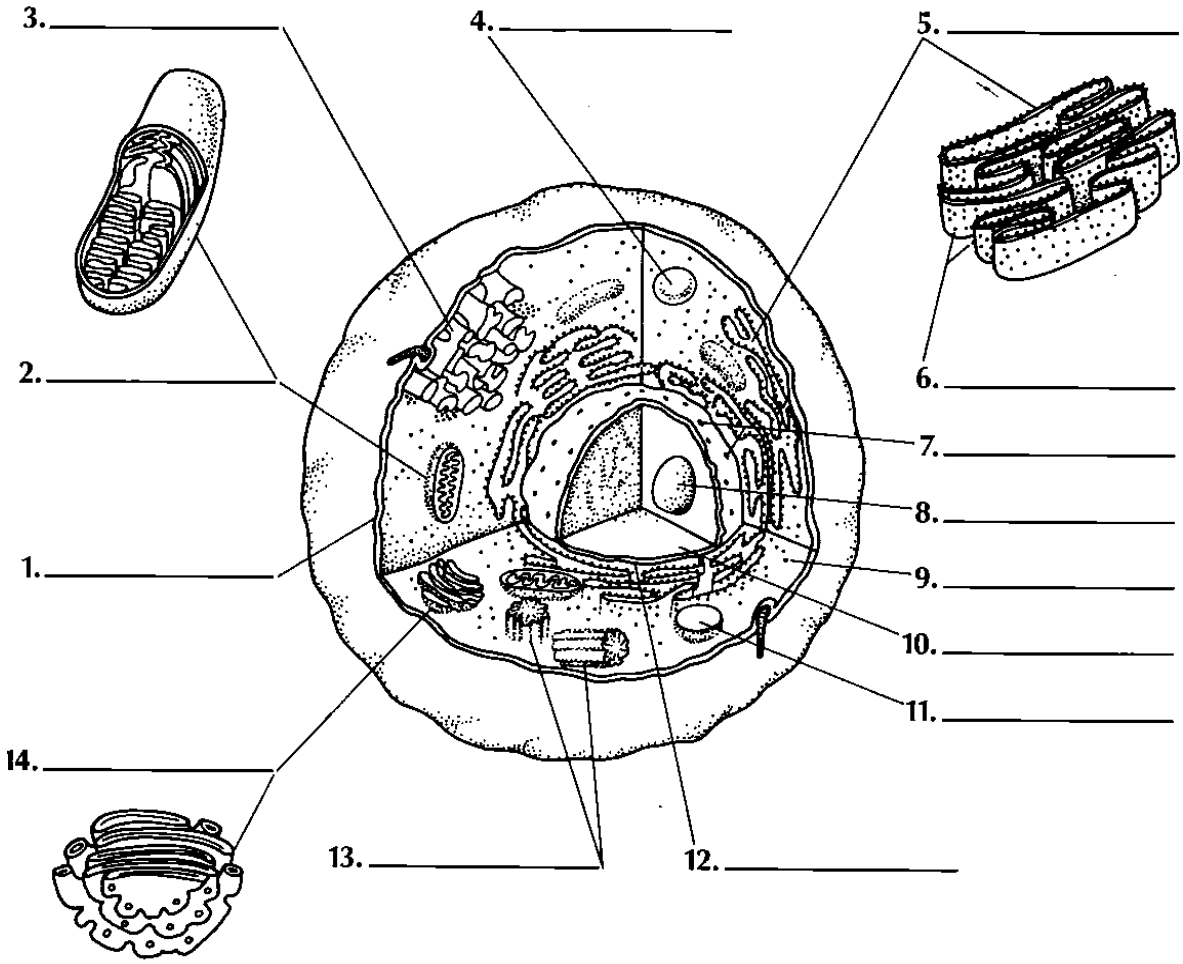
References and Notes	Work to Submit
	Writing:
Referring to pages 68, 70, 73, and 82 write answers for 3.1 - 3.5 ▶▶	3.1 (a) Define photosynthesis. (b) Where do organisms that photosynthesize get their energy? (c) Where do all other organisms get their energy? 3.2 What is the chemical equation for photosynthesis? 3.3 Define cellular respiration. 3.4 (a) Why is cellular respiration described as aerobic? (b) In what part of a cell does aerobic cellular respiration occur? 3.5 What is the chemical equation for cellular respiration?
See your instructor to see if there is anything else you should do for this unit.	

Appendix A

Diagrams



Generalized Structure of a Plant Cell



Generalized Structure of an Animal Cell