

Adult Basic Education
Science

Biology 2101B

Biodiversity

Study Guide

Prerequisite: Biology 2101A

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

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To the Student

I. Introduction to Biology 2101B

Biology 2101B introduces the classification system of living things. Scientific opinion suggests that there may be anywhere between ten to thirty million species in existence. A system as large as this requires organization. Organisms exhibit a huge range of diversity, yet maintain a number of basic things in common. In this course, you are given the opportunity to experience the array of organisms in a logical way based on their anatomy, physiology, and life cycles.

There is one required lab for this course and your instructor may get you to complete additional lab work. Let your instructor know in advance that you are getting close to needing to do the lab. The lab will require a written lab report, which will be evaluated as part of your course mark

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

Biology 2101A is a prerequisite to this course.

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
<p>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..</p>	<p>You come across three (3) headings in this right hand column.</p> <p>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 <u>as you go</u>.</p> <p>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.</p> <p>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.</p>

To the Student

III. Recommended Evaluation

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

The overall pass mark for the course is 50%.

Unit 1 - Patterns of Life

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

Reading for this unit: *Biology*

Chapter 4: Introduction: page 100
 Section 4.1: pages 102 - 105
 Section 4.2: pages 108 -109
 Section 4.3: pages 122 - 123

References and Notes

Referring to pages 102 - 109, write answers for questions 1.1 - 1.5

Referring to page 116, write an answer for question 1.6

Referring to page 122, write answers for questions 1.7 - 1.9

See your instructor to discuss any additional work that may be required for this unit.

Work to Submit

Writing:

- 1.1 List the characteristics that distinguish living things from non-living things.
- 1.2 Name the six kingdoms of living things.
- 1.3 Define taxonomy.
- 1.4 Name the 7 common groups (taxa) that are used to classify organisms.
- 1.5 Explain the term binomial nomenclature.
- 1.6 Explain what is meant by the term phylogeny.
- 1.7 Explain why viruses are not classified into any kingdom.
- 1.8 On what basis are viruses grouped?
- 1.9 Describe what a virus consists of.

Unit 2 - Micro-organisms

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

Reading for this unit: *Biology*

Chapter 5: Introduction: page 130
Section 5.1: pages 132 - 139
Section 5.2: pages 140 - 151
Section 5.3: pages 152 - 158

References and Notes

Referring to page 132 - 139, write answers for questions 2.1 - 2.2 □□

Note:

Remember that **prokaryotes** are organisms that lack a true nucleus and most other types of organelles; while **eukaryotes** are organisms with cells containing nuclei and other types of membrane-bound organelles.

Work to Submit

Writing:

2.1 Answer the following questions about bacteria (Kingdom Bacteria):

- (i) Are bacteria prokaryotic or eukaryotic?
- (ii) Are bacteria unicellular or multicellular?
- (iii) On what basis are bacteria classified?
- (iv) What are the three shapes of bacteria and the name used for each shape?
- (v) Bacteria usually reproduce by asexual reproduction. Name the process of asexual reproduction for bacteria.
- (vi) Some bacteria reproduce by sexual reproduction. Name the process of sexual reproduction for bacteria.

Unit 2 - Micro-organisms

References and Notes	Work to Submit
<p>Referring to page 140 - 151, write answers for all parts of question 2.3 □□</p> <p>Notes:</p> <p>Phyla is the plural of phylum.</p> <p>Make sure that you know what is meant by the following terms and how to use them properly in your notes:</p> <ul style="list-style-type: none">■ flagella■ pseudopodia■ cilia <p>Sporozoans do not move.</p>	<p>Writing:</p> <p>2.2 Answer the following questions about archaea (Kingdom Archaea):</p> <ol style="list-style-type: none">(i) Are archaea prokaryotic or eukaryotic?(ii) Are archaea unicellular or multicellular?(iii) On what basis are archaea classified?(iv) What are the 2 ways that archaea can reproduce? <p>2.3 Answer the following questions about protists (Kingdom Protista):</p> <ol style="list-style-type: none">(i) Are protists prokaryotic or eukaryotic?(ii) Are protists unicellular or multicellular?(iii) On what basis are protists classified?(iv) What are the three groups of protists and the type of nutrition of each?(v) Name the 4 phyla of protozoa; describe the type of movement of the organisms in each phylum; and give an example of an organism in each phylum.(See the Notes in the opposite column.)(vi) Describe the life cycle of <i>Plasmodium vivax</i> (as an example of a protist).

Unit 2 - Micro-organisms

References and Notes	Work to Submit
<p><i>Referring to page 152 - 158, write answers for all parts of question 2.4 ▶▶</i></p> <p>Note: <i>Fungi</i> is the plural of <i>fungus</i>.</p> <p><i>See your instructor to discuss any additional work that may be required for this unit.</i></p>	<p>Writing:</p> <p>2.4 Answer the following questions about fungi (Kingdom Fungi):</p> <ul style="list-style-type: none">(i) Are fungi prokaryotic or eukaryotic?(ii) Are most fungi unicellular or multicellular?(iii) Are fungi autotrophs or heterotrophs?(iv) What is the key feature used to classify fungi?(v) What are spores?(vi) Name the 4 phyla of fungi and the spore-bearing structures of each.(vii) Describe the life cycle of <i>Rhizopus stolonifera</i> (bread mould) as an example of a fungus.

Unit 3 - Plants and Animals

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

Reading for this unit: *Biology*

Chapter 6: Introduction: page 162
Section 6.1: pages 164 - 167
Section 6.2: pages 169 - 175
Section 6.3: pages 182 - 195

References and Notes

Referring to page 164 - 167, write answers for questions 3.1 - 3.5



Work to Submit

Writing:

3.1 Answer the following questions about plants (Kingdom Plantae):

- (i) Are plants prokaryotic or eukaryotic?
- (ii) Are plants unicellular or multicellular?
- (iii) Are plants autotrophs or heterotrophs?
- (iv) Are plants motile?
- (v) What reproductive strategy is unique to plants?
- (vi) What are the 3 main parts of most plants?
- (vii) Define and give the function of vascular tissue.

3.2 What are the 2 major groups that plants are divided into?

3.3

- (a) Explain what is meant by alternation of generations.
- (b) Define sporophyte and gametophyte.
- (c) Draw a diagram to show alternation of generations.

Unit 3 - Plants and Animals

References and Notes	Work to Submit
<p><i>Referring to page 169 - 175, write answers for questions 3.6 - 3.8</i></p> <p>►►</p>	<p>Writing:</p> <p>3.4 Answer the following questions about animals (Kingdom Animalia):</p> <ul style="list-style-type: none">(i) Are animals prokaryotic or eukaryotic?(ii) Are animals unicellular or multicellular?(iii) Are animals autotrophs or heterotrophs?(iv) Are most animals motile?(v) Explain the difference between vertebrates and invertebrates. <p>3.5 List the characteristics that biologists use to classify animals into phyla.</p> <p>3.6</p> <ul style="list-style-type: none">(a) Name the four broad groups into which the plant kingdom is divided.(b) What key feature or features are the basis for this grouping?(c) Name examples from each group. <p>3.7 What 2 features of ferns allow them to be more diverse and widespread than any other division of non-vascular plants?</p> <p>3.8 Explain why angiosperms are the most diverse and widespread members of the plant kingdom.</p>

Unit 3 - Plants and Animals

References and Notes	Work to Submit
<p><i>Referring to page 182 - 195, write answers for questions 3.9 - 3.12</i></p> <p>►►</p> <p><i>Referring to page 188 - 189, complete the investigation as explained</i> ►►</p> <p><i>(See your instructor to find out what you will need to pass in for evaluation of the lab.)</i></p> <p><i>See your instructor to discuss any additional work that may be required for this unit.</i></p>	<p>Writing:</p> <p>3.9 Why is Phylum Arthropoda (arthropods) considered the most successful animal phylum?</p> <p>3.10 What are the characteristics that all chordates (Phylum Chordata) have at some stage in their life history?</p> <p>3.11 The “jawed” chordates are divided into 6 classes.</p> <p>(a) Name the 6 classes (common names) giving the distinguishing features of each class.</p> <p>(b) Give examples from each class.</p> <p>3.12 To which class do humans belong?</p> <p>Laboratory:</p> <p>3.13 Complete Investigation 6.C, “Classifying Arthropods”.</p>