

Adult Basic Education
Level II Science

Science 2011 Life Science

Study Guide

Suggested Resources: *Discovering Science 7*
Discovering Science 8

Level II Science Courses
Science 2011 Life Science
Science 2012 Physical Science
Science 2013 Chemical Science
Science 2014 Electricity
Science 2015 Earth Science



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To the Student

Introduction to Science 2011

This course is intended to help you acquire the basic knowledge of Life Science that will prepare you for study in one of the Level III profiles (Degree and Technical, Business-Related College and General College).

You may/may not have to complete all ABE Level II Science courses. You are only required to complete sufficient Level II Science courses to ensure success in one of the Level III graduation profiles. For example, if you intend to complete the Degree-Technical Profile (Academic) in Level III, you may need to complete more Level II Science courses than if you intend to complete the General College Profile (General) in Level III.

Science 2011: Life Science is divided into two units. The outcomes for this course are given below. By completing the **Required Work** in this Study Guide, you will fulfill the outcomes for this course.

The first unit, ***Ecosystems***, will cover the following course outcomes:

- 1.01 Identify questions related to local ecosystems such as “What is an ecosystem?” and “What types of species live in a particular ecosystem?”
- 1.02 Describe an ecosystem as a group of interacting living and nonliving things.
- 1.03 Identify examples of ecosystems in Newfoundland and Labrador. Include: ocean, forest, pond, and arctic.
- 1.04 List examples of organisms that live in each ecosystem.
- 1.05 Describe the following abiotic factors of local ecosystems: intensity of sunlight and air, soil and water temperature.
- 1.06 Define the term “symbiosis”.
- 1.07 Define and give an example of “parasitism”, “mutualism” and “commensalism”.
- 1.08 Organize, compile and display data using tables and graphs.
- 1.09 Define the terms “producer”, “consumer”, and ‘decomposer’.
- 1.10 Given a diverse group of organisms, classify them as producers, consumers, or decomposers.

To the Student

- 1.11 Define the term “succession”.
- 1.12 Define the term “pioneer species”.
- 1.13 Define the term “climax community”.
- 1.14 Distinguish between primary and secondary succession.

The second unit, ***Cells, Tissues, Organs and Systems***, will cover the following course outcomes:

- 2.01 Define the term “cell”.
- 2.02 Identify and state the function of the major parts of the compound microscope:
 - eyepiece
 - objective lens
 - stage
 - coarse adjustment knob
 - fine adjustment knob
 - light source/lamp
 - iris diaphragm
 - base
 - barrel (or tube)
 - arm
 - revolving nosepiece
- 2.03 Use a light microscope to produce a clear image.
- 2.04 State the cell theory.
- 2.05 Define the terms “tissues”, “organs”, and “systems”.
- 2.06 Explain the relationships between and among cells, tissues, organs, and systems.
- 2.07 Diagram the relationship between cells, tissues, organs, and systems in a flow chart.

To the Student

Use of Science Study Guides

Before beginning this course, ensure you have the text(s) and any other resources needed.

Your Study Guide is organized as follows:

Required Work	Suggested Resources/Notes
<p>The left-hand column guides you through the material you must complete in order to successfully complete the course. You will see three headings in this left-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.</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 “Suggested Resources/Notes” column will indicate any additional information you need to complete the assignment. These assignments frequently relate the science content to a practical application.</p>	<p>This right-hand column provides you with information on the resources needed for the course. It also draws your attention to assignments and core labs that will be evaluated as part of your final course mark. Other notes may be included here such as helpful suggestions, safety precautions, etc.</p>

To the Student

Recommended Evaluation

Written Notes	20%
Labs/Assignments/Test(s)	30%
Final Exam (entire course)	<u>50%</u>
	100%

The overall pass mark for the course is 50%.

Note: The evaluation scheme recommended above is presented as a suggestion. Institutions may choose an alternate evaluation scheme in order to meet the individual needs of adult learners.

Unit 1: Ecosystems

Required Work	Suggested Resources/Notes
<p>Writing:</p> <p>1. Read pages 8-9 in <i>Discovering Science 7</i>, and then complete the following items:</p> <ul style="list-style-type: none"> a) What is an ecosystem? b) What is the difference between abiotic and biotic parts of an ecosystem? Give an example of each. c) Describe one example of an ecosystem as a group of living and nonliving things. An example to help you would be ants (living things) living under a rotting log (nonliving thing). d) In what kind of ecosystem would you expect to find the habitat of a beaver? e) Identify three biotic parts of its ecosystem that would be important for a beaver. f) Identify three abiotic parts of its ecosystem that would be important for a beaver. <p>2. Read pages 10-12 in <i>Discovering Science 7</i>, and then complete the following items:</p> <ul style="list-style-type: none"> a) Identify four examples of ecosystems in Newfoundland and Labrador. b) List two examples of organisms that live in each ecosystem listed above. c) List four abiotic factors that affect the survival of organisms. 	<p>This unit covers selected readings from <i>Discovering Science 7</i>. For the purpose of this course, you only need to read and understand the pages noted in the other column.</p> <p>Make sure you ask your instructor if there are any words, concepts or questions that you do not understand.</p> <p>The Glossary on pages 481-490 may be helpful in defining terms.</p>

Unit 1: Ecosystems

Required Work	Suggested Resources/Notes
<p>d) Give an example of how each abiotic factor listed above affects the survival of one organism; for example, what abiotic factors might affect a dandelion growing on a lawn?</p> <p>3. Read pages 17-19 in <i>Discovering Science 7</i>, and then complete the following items:</p> <ul style="list-style-type: none">a) Explain how the light intensity can affect an organism in an ecosystem.b) Explain how temperature can affect an organism in an ecosystem.c) Explain how soil can affect an organism in an ecosystem.d) Explain how air and wind can affect an organism in an ecosystem.e) Explain how water can affect an organism in an ecosystem.f) Roses grow best in sunny conditions. What effect might it have on your roses if your neighbor builds a tall fence next to your rose garden? Explain your response.	<p>Note: If you prefer, you can respond to these items using an example from the text or from your life experiences.</p>

Unit 1: Ecosystems

Required Work	Suggested Resources/Notes
<p>4. Read pages 24-25 in <i>Discovering Science 7</i>, and then complete the following items:</p> <ol style="list-style-type: none"> <li data-bbox="283 566 1046 639">a) What is a species? Name two plant species and two animal species. <li data-bbox="283 677 1046 783">b) Name three levels of biological organization that can be studied in an ecosystem, and write a brief definition of each. <li data-bbox="283 825 1046 1009">c) A scientist measures the size of a wolf population at two different times during the year and finds that the population number has changed. Suggest one reason why the population may have increased and one reason why it may have decreased. <p>5. Read pages 34-37 in <i>Discovering Science 7</i>, and then complete the following items:</p> <ol style="list-style-type: none"> <li data-bbox="283 1199 1046 1231">a) Define the term “symbiosis”. <li data-bbox="283 1262 1046 1336">b) Give an example of symbiosis from an ecosystem in your local area (ocean, forest, bog, etc). <li data-bbox="283 1374 1046 1522">c) Define the following terms: <ul style="list-style-type: none"> <li data-bbox="381 1417 567 1448">• mutualism <li data-bbox="381 1453 567 1484">• parasitism <li data-bbox="381 1488 626 1520">• commensalism <li data-bbox="283 1564 1046 1818">d) Consider each of the following pairs of organisms and name the type of symbiotic relationship the partners might have. What are the benefits or disadvantages for each partner? <ul style="list-style-type: none"> <li data-bbox="381 1712 789 1744">• a flowering plant and a bee <li data-bbox="381 1748 643 1780">• a dog and a flea <li data-bbox="381 1784 724 1816">• a barnacle and a whale 	<p>The Glossary on pages 481-490 may be helpful in defining terms.</p> <p>The Glossary on pages 481-490 may be helpful in defining terms.</p> <p>For item d), your choices are: mutualism, parasitism, and commensalism.</p>

Unit 1: Ecosystems

Required Work	Suggested Resources/Notes
<p>6. Read pages 40-42 in <i>Discovering Science 7</i>, and then complete the following items:</p> <p>a) Define and give an example of the following terms:</p> <ul style="list-style-type: none">• producer• consumer• decomposer• herbivore• carnivore• omnivore <p>b) Classify each of the following as a producer, consumer or decomposer. Explain your choice.</p> <ul style="list-style-type: none">• dandelion• robin• fungi• butterfly• lobster• shark• potato• bacteria• grass <p>c) Are you a producer or a consumer? Explain your answer.</p> <p>d) Are you a carnivore, herbivore, or omnivore? Explain your answer.</p> <p>e) What do you think would happen if all of the decomposers in the world suddenly disappeared?</p>	<p>The Glossary on pages 481-490 may be helpful in defining terms.</p>

Unit 1: Ecosystems

Required Work	Suggested Resources/Notes
<p>7. Read pages 70-71 in <i>Discovering Science 7</i>, and then complete the following items:</p> <p>a) Define the following terms and give an example for each one:</p> <ul style="list-style-type: none">• succession• pioneer species• climax community• primary succession• secondary succession	The Glossary on pages 481-490 may be helpful in defining terms.
<p>Assignment 1</p> <p>Read <u>2-1A The Ups and Down of Living Together</u> on page 38 of <i>Discovering Science 7</i>. Also, study the data chart included with this activity. Then, complete the following.</p> <p>a) <i>What to Do</i>, number 1</p> <p>b) <i>What Did You Find Out</i>, numbers 1-8</p>	This assignment will be submitted to your instructor, and is part of your evaluation for this course.

Unit 2: Cells, Tissues, Organs and Systems

Required Work	Suggested Resources/Notes
<p>1. Read pages 390-396 in <i>Discovering Science 8</i>, and then complete the following items:</p> <ol style="list-style-type: none">a) What is a cell?b) Be able to identify the following parts of a light microscope:<ul style="list-style-type: none">• eyepiece• tube• arm• coarse adjustment knob• fine adjustment knob• objective lens• revolving nosepiece• stage• iris diaphragm• light source• basec) You are exploring a remote region in Labrador. You unexpectedly discover what may be a new microscopic life form in a sample of pond water. How could you determine if this sample is living or non-living? <p>2. Read pages 404-406 in <i>Discovering Science 8</i>, and then state the cell theory.</p>	<p>#1 can be completed by doing “Checking Concepts”, number 3, on page 401 of <i>Discovering Science 8</i>.</p> <p>The Glossary on pages 498-504 may be helpful in defining terms.</p>

Unit 2: Cells, Tissues, Organs and Systems

Required Work	Suggested Resources/Notes
<p>3. Read pages 420-423 in <i>Discovering Science 8</i>, and then complete the following items:</p> <ul style="list-style-type: none">a) What is a system?b) What happens if one part of the system is missing or damaged?c) How are tissues related to cells?d) How are organs related to tissues?e) Complete item number 8 in the “Understanding Key Ideas” section on page 425 of the text.	<p>The Glossary on pages 498-504 may be helpful in defining terms.</p>
<p>Laboratory 1</p> <p>Read <u>10-1A: Setting Up and Using a Microscope</u> on page 394 of <i>Discovering Science 8</i>. Make sure you fully understand the safety information. You only need to complete Part 1 of the procedure for this course; however, you can complete Parts 2 and 3 as an optional activity. Then, complete the following:</p> <ul style="list-style-type: none">a) Compare each of the drawings you made in this activity (Explain how they are different).b) Describe how your images changed when you increased the power of magnification; for example, did you see more or less of an image, or was it easier or harder to focus on the whole image?	<p>This lab activity will be submitted to your instructor, and is part of your evaluation for this course. Be sure to ask your instructor for help if you do not fully understand any part of the procedure or safety instructions.</p>