

Adult Basic Education  
**Level II Science**

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## **Science 2011 Life Science**

### **Curriculum 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 Instructor

### **Introduction to Science 2011**

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

Students may/may not have to complete all ABE Level II Science courses. Students are only required to complete sufficient Level II Science courses to ensure success in one of the Level III graduation profiles. For example, a Level II student intending to complete the Degree-Technical Profile (Academic) in Level III may need to complete more Level II Science courses than a student intending 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 the Study Guide, students 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.

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- 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.

Students are required to complete one assignment and one core lab in this course. Instructors have flexibility to substitute another assignment and/or core lab if it is felt that the ones included in the Study Guide are inappropriate. The recommended resources for this course contain additional labs and assignments which may be used.

There are a number of Blackline Masters (BLM’s) contained on the website accompanying the text that can be useful in conducting lab activities. Instructors are encouraged to preview this material and to exercise professional discretion in how to use it in the ABE classroom. Also, a number of these BLM’s may be appropriate for use as assignments, unit reviews and for test/exam construction. Information on how to access **[www.discoveringscience.ca](http://www.discoveringscience.ca)** is contained in the accompanying *Teacher’s Resource* for the *Discovering Science* series.

## To the Instructor

### Curriculum Guide

Each new ABE Level II Science course has a Curriculum Guide for the instructor and a Study Guide for the student. The Curriculum Guide includes the specific curriculum outcomes for the course. Suggestions for teaching, learning and assessment are provided to support student achievement of the outcomes. Some suggestions for teaching, learning and assessment will be repeated in the curriculum guides for the science courses when appropriate. Each course is divided into units. Each unit is presented in the Curriculum Guide as a **two-page layout of four columns** as illustrated in the figure below.

#### **Curriculum Guide Organization The Two-Page, Four-Column Spread**

<b>Unit Number – Unit Title</b>		<b>Unit Number – Unit Title</b>	
<b>Outcomes</b>  Specific curriculum outcomes for the unit.	<b>Notes for Teaching and Learning</b>  Suggested activities, elaboration of outcomes, and background information.	<b>Suggestions for Assessment</b>  Suggestions for assessing students' achievement of outcomes.	<b>Resources</b>  Recommended resources that address outcomes.

### Study Guide

The Study Guide provides the student with the name of the text(s) required for the course and specifies the sections and pages that the student will need to refer to in order to complete the **Required Work** for the course. It guides the student through the course by assigning relevant reading and providing questions and/or assigning questions from the text or some other resource. Sometimes it also provides important points for students to note. The Study Guide is designed to give students some degree of independence in their work. Instructors should note, however, that there is material in the Curriculum Guide in the *Notes for Teaching and Learning* and *Suggestions for Assessment* columns that is not included in the Study Guide, and instructors will need to review this information and decide how to include it.

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### Resources

Recommended student resources for this course:

- *Discovering Science 7*. McGraw-Hill Ryerson. 2008. <http://www.mcgrawhill.ca>
- *Discovering Science 8*. McGraw-Hill Ryerson. 2009. <http://www.mcgrawhill.ca>
- *Website* ([www.discoveringscience.ca](http://www.discoveringscience.ca))
  - Provides links to sites that support Internet Connect, Explore More Features, and Integrated Research Investigations in the textbook.
  - Links to interesting educational and entertaining sites that support the curriculum.

Recommended instructor resources:

- *Teacher's Resource* (print)
- *Teacher's Resource* (CD-ROM)
  - Contains complete text of print Teacher's Resource in PDF format.
  - Contains modifiable Blackline Masters in both English and French.
  - Contains assessment checklists and rubrics.
- *Computerized Assessment Bank* (CD-ROM) in both English and French
  - Contains 1200 questions
  - Contains a variety of question types
  - All answers are provided
  - User-friendly ExamView software
- *Website* ([www.discoveringscience.ca](http://www.discoveringscience.ca))
  - Contains additional interactive on-line resources for instructors.
  - Contains additional links for instructors.

**Note: Instructors may have to adapt the content of these instructor resources to meet the needs of their individual ABE students.**

The *Discovering Science* series of texts is a brand new science resource for Newfoundland and Labrador. The student and teacher resources contained in this series are designed to provide 100% alignment with Newfoundland and Labrador's intermediate science curriculum, on which the ABE Level II Science curriculum is based. These resources have been reviewed by Newfoundland and Labrador educators for their usefulness, content, design, relevancy and readability.

The *Teacher's Resource* for this series contains valuable resources for instructors. Like the texts, these resources were developed with the Newfoundland and Labrador intermediate science curriculum in mind as well as the principles of scientific literacy. Instructors are encouraged to utilize the *Teacher's Resource* and have the flexibility to adapt any material contained in the resources to better meet the needs of adult learners.

### **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. The Department of Education has no requirement that a final exam must be given in this course. Instructors/institutions can decide if a final exam is necessary based on their own policies and procedures.

## Unit 1: Ecosystems—Suggestions for Teaching, Learning and Assessment

Outcomes	Notes for Teaching and Learning
1.01 Identify questions related to local ecosystems such as “What is an ecosystem?” and “What types of species live in a particular ecosystem?”	<ul style="list-style-type: none"> <li>Instructors may encourage students to read “A Tour of Your Textbook” located on pages x-xvi of the student textbook. This tour explains in detail the key structural features of the textbook.</li> </ul>
1.02 Describe an ecosystem as a group of interacting living and nonliving things.	<ul style="list-style-type: none"> <li>Instructors may point out the <b>Internet Connect</b> feature of the textbook. This may be helpful for students. This feature uses <a href="http://www.discoveringscience.ca">www.discoveringscience.ca</a> to learn more about the topic being studied.</li> </ul>
1.03 Identify examples of ecosystems in Newfoundland and Labrador. Include: ocean, forest, pond, and arctic.	<ul style="list-style-type: none"> <li>The username and password for <a href="http://www.discoveringscience.ca">www.discoveringscience.ca</a> are contained in the accompanying <i>Teacher’s Resource</i>.</li> </ul>
1.04 List examples of organisms that live in each ecosystem.	<ul style="list-style-type: none"> <li>Instructors are encouraged to read and become familiar with pages TR-1 to TR-17 in the <i>Teacher’s Resource</i>. Although the information contained in these pages is written for intermediate science teachers, there is sufficient information presented in these pages to be of use to ABE instructors as well.</li> </ul>
1.05 Describe the following abiotic factors of local ecosystems: intensity of sunlight and air, soil and water temperature.	<ul style="list-style-type: none"> <li>The <i>Teacher’s Resource</i> contains notes for teaching and learning. Instructors can read through this material for information to supplement their teaching. Instructors can use their professional judgment in determining what information is useful.</li> </ul>
1.06 Define the term “symbiosis”.	<ul style="list-style-type: none"> <li>Students will be introduced to many new terms throughout this course. Instructors may wish to have students start a vocabulary list and add to it regularly as they work through this unit. The <b>Glossary</b> can be useful to provide definitions.</li> </ul>
1.07 Define and give an example of “parasitism”, “mutualism” and “commensalism”.	<ul style="list-style-type: none"> <li>Students can be encouraged to prepare Key Word Concept Maps.</li> </ul>
1.08 Organize, compile and display data using tables and graphs.	<ul style="list-style-type: none"> <li>Instructors should encourage students to keep work organized, neat and legible. Although not mandatory, students can be encouraged to type all written response work on a computer if resources allow.</li> </ul>

## Unit 1: Ecosystems—Suggestions for Teaching, Learning and Assessment

Outcomes	Notes for Teaching and Learning
<p>1.09 Define the terms producer, consumer, and decomposer.</p> <p>1.10 Given a diverse group of organisms, classify them as producers, consumers, or decomposers.</p>	<ul style="list-style-type: none"><li>• <a href="http://www.discoveringscience.ca">www.discoveringscience.ca</a> contains the following BLM's under the <i>Discovering Science 7</i> link (Note that instructors need to be registered in order to access this material. Register by following the prompts and provide all required information):<ul style="list-style-type: none"><li>○ Unit Summary containing key concepts and terms</li><li>○ Word Search Puzzle containing key terms</li><li>○ Key Terms Crossword (may contain extra terms)</li><li>○ What Is an Ecosystem Chart</li><li>○ Life in a Strange Ecosystem Story</li><li>○ Interactions in Atlantic Ecosystems Worksheets</li><li>○ Studying a Pond Ecosystem</li><li>○ Chapter Review Worksheets</li><li>○ Symbiotic Relationships Worksheet</li><li>○ Food Chain, Food Web and Energy Transfer Diagrams</li><li>○ Primary Succession Diagram</li><li>○ Secondary Succession from Beaver Pond to Forest Worksheet</li><li>○ Answer keys to all BLM worksheets</li><li>○ <b>Note: Instructors may have to adapt some of this material. Use of this material is at the discretion of the instructor.</b></li></ul></li></ul>

## Unit 1: Ecosystems—Suggestions for Teaching, Learning and Assessment

Suggestions for Assessment	Recommended resources that address outcomes
<ul style="list-style-type: none"><li>Instructors should ensure that students understand the reading material presented in the text. Although the text is written for students at a junior high reading level, adult learners may have some difficulty understanding the language.</li><li>The <i>Teacher's Resource</i> provides an explanation concerning the relationship between assessment and evaluation. Instructors may wish to read page 2 in the <i>Teacher's Resource</i> for material on this relationship.</li><li>Instructors should review all written responses completed by students based on the <b>Required Work</b> in the Study Guide. Ideally, this should be reviewed prior to students writing any tests/exams. Instructors may discuss both strengths and weaknesses based on this review. It is suggested that instructors allow students to re-do any items that may be incorrect or incomplete.</li><li>Instructors are encouraged to become familiar with the assessment tools provided in the <i>Teacher's Resource</i>. Instructors can exercise professional judgement to determine how to integrate these assessment tools in their teaching practice. These assessment tools include such things as rubrics, checklists, observation notes, and self-assessment. These tools are also available on the accompanying CD and website.</li><li>Instructors will find answers to some of the written work contained in the <i>Teacher's Resource</i>.</li><li>Instructors will find Blackline Masters (BLM's) on the website <a href="http://www.discoveringscience.ca">www.discoveringscience.ca</a>. Instructors will have to register in order to gain access to the teacher resources on this site. Follow the prompts and complete all required fields. Instructors can exercise professional judgement in determining how they wish to integrate these BLM's into their teaching.</li></ul>	<ul style="list-style-type: none"><li>Many of the written response items contained in the Study Guide are based on the <b>Reading Check</b> exercises from the text. Instructors may use the <b>Checking Concepts and Understanding Key Ideas</b> sections in the text for supplemental study and evaluation material.</li><li>See page 2 in the <i>Teacher's Resource</i> for information on the relationship between assessment and evaluation.</li><li>See page 6 in the <i>Teacher's Resource</i> for information on some suggested assessment methods.</li><li>See page 7 in the <i>Teacher's Resource</i> for material on assessment tools.</li><li>Page 11 in the <i>Teacher's Resource</i> contains a sample record keeping tool that instructors may find helpful.</li><li>The username and password for <a href="http://www.discoveringscience.ca">www.discoveringscience.ca</a> are in the accompanying <i>Teacher's Resource</i>.</li></ul>

**Unit 2: Cells, Tissues, Organs and Systems--Suggestions for Teaching, Learning and Assessment**

Outcomes	Notes for Teaching and Learning
2.01 Define the term “cell”.	
2.02 Identify and state the function of the major parts of the compound microscope:	<ul style="list-style-type: none"> <li>• eyepiece</li> <li>• objective lens</li> <li>• stage</li> <li>• coarse adjustment knob</li> <li>• fine adjustment knob</li> <li>• light source/lamp</li> <li>• iris diaphragm</li> <li>• base</li> <li>• barrel (or tube)</li> <li>• arm</li> <li>• revolving nosepiece</li> </ul>
2.03 Use a light microscope to produce a clear image.	<ul style="list-style-type: none"> <li>• The <i>Discovering Science 8</i> text is organized almost identical to <i>Discovering Science 7</i> used in Unit 1; therefore, students should be familiar with the layout and features of the resource.</li> </ul>
2.04 State the cell theory.	<ul style="list-style-type: none"> <li>• Instructors may point out the <b>Internet Connect</b> feature of the textbook. This may be helpful for students. This feature uses <a href="http://www.discoveringscience.ca">www.discoveringscience.ca</a> to learn more about the topic being studied.</li> </ul>
2.05 Define the terms “tissues”, “organs”, and “systems”.	<ul style="list-style-type: none"> <li>• The username and password for <a href="http://www.discoveringscience.ca">www.discoveringscience.ca</a> are in the accompanying <i>Teacher’s Resource</i>.</li> </ul>
2.06 Explain the relationships between and among cells, tissues, organs, and systems.	<ul style="list-style-type: none"> <li>• Instructors are encouraged to read and become familiar with pages TR-1 to TR-17 in the <i>Teacher’s Resource</i>. Although the information contained in these pages are written for intermediate science teachers, there is sufficient information presented in these pages to be of use to ABE instructors as well. Also, this material is the same as contained in the <i>Discovering Science 7 Teacher’s Resource</i>.</li> </ul>
2.07 Diagram the relationship between cells tissues, organs, and systems in a flow chart.	<ul style="list-style-type: none"> <li>• The <i>Teacher’s Resource</i> contains notes for teaching and learning. Instructors can read through this material for information to supplement their teaching. Instructors can use their professional judgment in determining what information is useful.</li> </ul>
	<ul style="list-style-type: none"> <li>• Students will be introduced to many new terms throughout this course. Instructors may wish to have students start a vocabulary list and add to it regularly as they work through this unit. The <b>Glossary</b> can be useful to provide definitions.</li> </ul>
	<ul style="list-style-type: none"> <li>• Students can be encouraged to prepare Key Word Concept Maps.</li> </ul>
	<ul style="list-style-type: none"> <li>• Instructors may wish to encourage students to keep work organized, neat and legible. Although not mandatory, students can be encouraged to type all written response work on a computer if resources allow.</li> </ul>

## Unit 2: Cells, Tissues, Organs and Systems--Suggestions for Teaching, Learning and Assessment

Outcomes	Notes for Teaching and Learning
	<ul style="list-style-type: none"><li>• <b>www.discoveringscience.ca</b> contains the following useful BLM's under the <i>Discovering Science 8</i> link (Note that instructors need to be registered in order to access this material. Register by following the prompts and provide all required information):<ul style="list-style-type: none"><li>○ Unit Summary containing key concepts and terms</li><li>○ Diagram of microscope</li><li>○ Parts of a microscope worksheet</li><li>○ Diagram of animal and plant cells</li><li>○ Word Search puzzle containing key terms</li><li>○ Represent the Relationship worksheet to show relationships among the components of the human organism (cells, tissues, organs, and organ systems)</li><li>○ Answer Keys to all BLM worksheets</li><li>○ <b>Note: Instructors may have to adapt some of this material. Use of this material is at the discretion of the instructor.</b></li></ul></li></ul>

## **Unit 2: Cells, Tissues, Organs and Systems--Suggestions for Teaching, Learning and Assessment**

<b>Suggestions for Assessment</b>	<b>Recommended resources that address outcomes</b>
<ul style="list-style-type: none"><li>• Same general comments as for Unit 1.</li></ul>	<ul style="list-style-type: none"><li>• Same general comments as for Unit 1.</li><li>• Additional resources for the instructor is available online.</li><li>• The username and password for <b>www.discoveringscience.ca</b> are in the accompanying <i>Teacher's Resource</i>.</li></ul>