

SECTION 3:

DOCUMENT ORGANIZATION

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DOCUMENT ORGANIZATION

Document Organization and Format

The suggestions for instruction and assessment contained within *Grade 11 Biology: A Foundation for Implementation* provide teachers with strategies for assisting students in achieving the general and specific learning outcomes identified for this curriculum. The instructional and assessment suggestions offer teachers a range of strategies from which to select appropriate directions with students. Although they are not prescriptive, the strategies presented can be considered starting points from which teachers can include their own initiatives, style, and effective techniques to foster learning.

The topic-related appendices (found at the end of each unit) and the general appendices (found at the end of this document) provide additional information on student learning activities, teacher support materials related to instruction and assessment, and a variety of assessment rubrics. These complementary resources are closely linked to the specific learning outcomes and to the skills and attitudes outcomes, and are designed to support, facilitate, and enhance student learning.

At-a-glance listings of the general learning outcomes, skills and attitudes outcomes, and specific learning outcomes for Grade 11 Biology are provided in Appendix 12.

Guide to Reading the Learning Outcomes and the Document Format

The specific learning outcomes identified for Grade 11 Biology are organized according to six units:

- Unit 1: Wellness and Homeostasis
- Unit 2: Digestion and Nutrition
- Unit 3: Transportation and Respiration
- Unit 4: Excretion and Waste Management
- Unit 5: Protection and Control
- Unit 6: Wellness and Homeostatic Changes

The suggested strategies for implementing the curricular outcomes within each biology unit include the following components:

- **Specific Learning Outcomes (SLOs):** The SLOs, identified at the top of each page within the units, outline the intended learning to be achieved by the student by the end of the course. They include the SLOs related to the particular biology topic, in addition to the learning outcomes related to Cluster 0: Skills and Attitudes, selected to correspond to the Suggestions for Instruction.
- **General Learning Outcome (GLO) Connections:** The GLOs, found in Appendix 12, provide links across the entire scope of the Kindergarten to Grade 12 continuum of learning in science. These GLOs provide connections to the Five Foundations for Scientific Literacy that guide all Manitoba science curricula in all science discipline areas.

- **Suggestions for Instruction:** The instructional strategies relate directly to the achievement of the identified SLOs. In each unit, SLOs may be grouped into related topics.
- **Entry-Level Knowledge:** Students will have prior knowledge in relation to some learning outcomes. Identification of students' entry-level knowledge, where included, links teachers to key areas of the science curriculum from previous years, providing information about where students should be in relation to the present learning outcomes.
- **Background Information:** These notes provide teachers with content background (often beyond what the students are required to know) related to the identified learning outcomes.
- **Activate:** By activating students' prior knowledge of a topic, teachers can recognize gaps and misconceptions in student knowledge and adjust their instruction appropriately, stimulate student curiosity and initiate the inquiry process, and help students relate new information, skills, and strategies to what they already know and can do. Suggested activating strategies are provided for all groupings of SLOs.
- **Acquire/Apply:** These instructional strategies are designed to assist students in processing, integrating, and consolidating their learning. The examples of teacher-facilitated acquiring and applying strategies presented in this document are designed to be student-centred, engaging the learner directly in some contextual way. The skills linked to the suggested acquiring and applying strategies are provided as well.
- **Teacher Notes:** These notes, incorporated throughout the document, provide teachers with planning hints, cautions, and information on the depth of treatment of certain issues related to the identified learning outcomes.
- **Suggestions for Assessment:** These suggestions offer strategies for assessing students' achievement of the SLOs. As wellness is a major theme throughout the course, a recommended tool to help students explore this theme is the development of a Wellness Portfolio. A number of other assessment tools in a variety of formats are suggested in addition to the portfolio assignments.
- **Resource Links:** The links to websites suggested within the units are intended to provide additional resources to support student learning. They include the websites listed on the following pages.

Note: These websites were accessed in July 2010. Any websites referenced in this document are subject to change. If the sites become inactive, please use a search engine to locate the online resources.

In addition to suggesting online resources, this document refers to various print resources, including the following:

Manitoba Education and Transplant Manitoba. *Life Is a Gift: A Manitoba Grade 11 Biology Resource for Organ Donation and Transplantation*. Winnipeg, MB: Manitoba Education, 2010.

Resource Links

- AllRefer Health. "Sickle Cell Anemia." *Diseases & Conditions*.
<<http://health.allrefer.com/health/sickle-cell-anemia-red-blood-cells-normal.html>>.
- Berkeley Lab. "The Virtual Frog Dissection Kit." *Computer-Enhanced Science Education: The Whole Frog Project*. <<http://froggy.lbl.gov/>>.
- Burger King Canada. *Menu & Nutrition*. <www.bk.com/en/us/menu-nutrition/full-menu.html>.
- Canadian Blood Services. Home Page. <www.bloodservices.ca/>.
- Canadian Diabetes Association. Home Page. <www.diabetes.ca/>.
- Canadian Fitness and Lifestyle Research Institute. Home Page.
<www.cflri.ca/eng>.
- Cells Alive. Home Page. <www.cellsalive.com/>.
- Dietitians of Canada. "Let's Make a Meal!" *Eat Well, Live Well*.
<www.dietitians.ca/public/content/eat_well_live_well/english/menuplanner/overview.asp>.
- ECG Library. Home Page. <www.ecglibrary.com/>.
- Farabee, Michael J. *Online Biology Book*. 1992–2007. Curriki.
<www.curriki.org/xwiki/bin/view/Coll_torquedellipse/OnlineBiologyBook>.
- Fleck, Earl W. "Virtual Pig Dissection." Whitman College Biology Department.
<www.whitman.edu/biology/vpd/>.
- Health Canada. *Eating Well with Canada's Food Guide*. Ottawa, ON: Health Canada, 2007. Available online at <www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php>.
- . *Eating Well with Canada's Food Guide: First Nations, Inuit and Métis*. Ottawa, ON: Health Canada, 2007. Available online at
<www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php>.
- . "Interactive Nutrition Labelling and Quiz." *Food and Nutrition*.
<www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/index-eng.php>.
- . "Nutrition Labelling." *Food and Nutrition*. <www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/index-eng.php>.
- . "Tobacco." *Health Concerns*. <www.hc-sc.gc.ca/hc-ps/tobac-tabac/index-eng.php>.
- Heart and Stroke Foundation. Home Page. <www.heartandstroke.com/>.

- . *Get Your Blood Pressure under Control*. Ottawa, ON: Heart and Stroke Foundation, n.d. Available online at <www.heartandstroke.com/atf/cf/%7B99452D8B-E7F1-4BD6-A57D-B136CE6C95BF%7D/Get-your-blood-pressure-under-control-en.pdf>.
- . "Statistics." *News*.
<www.heartandstroke.com/site/c.iKlQLcMWJtE/b.3483991/k.34A8/Statistics.htm>
- Howard Hughes Medical Institute (HHMI). "The Visible Heart." *Cardiovascular: Animations*.
<www.hhmi.org/biointeractive/cardiovascular/animations.html>.
- International Society for Mountain Medicine. Home Page. <www.ismmed.org>.
- Kent State University. "Criteria for Evaluating Web Resources." 22 Mar. 2006. *University Libraries*. <www.library.kent.edu/page/10475>.
- The Lung Association, Manitoba. Home Page. <www.mb.lung.ca/>.
- . "Resource Links." *Occupational Lung Monitoring Program*.
<www.mb.lung.ca/index.php?pageid=49>.
- Manitoba Education. "Bibliographies." *Learning Resources*.
<www.edu.gov.mb.ca/k12/learnres/bibliographies.html>.
- . *Information Communication Technology (ICT): Kindergarten to Grade 12*.
<www.edu.gov.mb.ca/k12/tech/index.html>.
- . "Professional Learning for Teachers." *Literacy with ICT Across the Curriculum: A Developmental Continuum*.
<www.edu.gov.mb.ca/k12/tech/lict/let_me_try/le_teachers.html>.
- Manitoba Education and Training. *Education for a Sustainable Future: A Resource for Curriculum Developers, Teachers, and Administrators*. Winnipeg, MB: Manitoba Education and Training, 2000. Available online at
<www.edu.gov.mb.ca/k12/docs/support/future/>.
- . *Science Safety: A Kindergarten to Senior 4 Resource Manual for Teachers, Schools, and School Divisions*. Winnipeg, MB: Manitoba Education and Training, 1997. Available online at <www.edu.gov.mb.ca/k12/docs/support/scisafe/>.
- Manitoba Education, Citizenship and Youth. *Communicating Student Learning: Guidelines for Schools*. Winnipeg, MB: Manitoba Education, Citizenship and Youth, 2008. Available online at
<www.edu.gov.mb.ca/k12/assess/docs/csl/index.html>.
- . *Rethinking Classroom Assessment with Purpose in Mind: Assessment for Learning, Assessment as Learning, Assessment of Learning*. Winnipeg, MB: Manitoba Education, Citizenship and Youth, 2006. Available online at
<www.edu.gov.mb.ca/k12/assess/wncp/index.html>.

- Manitoba Healthy Living, Youth and Seniors. Home Page.
<www.gov.mb.ca/healthyliving/index.html>.
- McDonald's Canada. *Nutrition Calculator*.
<www.mcdonalds.ca/NutritionCalculator/index_en.html>.
- The National Center for Case Study Teaching in Science. *Case Collection*.
<<http://ublib.buffalo.edu/libraries/projects/cases/ubcase.htm>>.
- Public Broadcasting Service (PBS) Online. *Everest*. Apr. 1999.
<www.pbs.org/wgbh/nova/everest/>.
- Schrock, Kathleen. "The Five W's of Web Site Evaluation." 2001-2009. *The ABC's of Web Site Evaluation*. <<http://kathyschrock.net/abceval/5ws.pdf>>.
- . "Web Site Evaluation & Internet Lesson Plan Guide." 2002. *The ABC's of Web Site Evaluation*. <<http://kathyschrock.net/abceval/teacherwebeval.pdf>>.
- SUBWAY. *Nutrition Information*.
<www.subway.com/applications/nutritioninfo/index.aspx>.
- Timiskaming Health Unit. *Blood Pressure Quiz: Know Your Blood Pressure by Heart*. 27 Aug. 2007.
<www.timiskaminghu.com/content.asp?navID=116&parentID=115&lang=en>.
- University at Buffalo. *The National Center for Case Study Teaching in Science Case Collection*. <<http://ublib.buffalo.edu/libraries/projects/cases/ubcase.htm>>.
- University of Manitoba. "Dr. Gordon Giesbrecht." *Health, Leisure, and Human Performance Research Institute*.
<<http://umanitoba.ca/faculties/phyzed/research/people/giesbrecht>> and
<<http://umanitoba.ca/faculties/kinrec/research/people/giesbrecht.html>>.
- U.S. National Library of Medicine. *The Visible Human Project*. 11 Sept. 2003.
<www.nlm.nih.gov/research/visible/visible_human.html>.
- WebQuest.Org. Home Page. <<http://webquest.org/>>.
- Wendy's Canada. *Nutrition Information*.
<www.wendys.com/food/pdf/ca/nutrition.pdf>.
- Wiley. "Interactive Animations." *Interactive Concepts in Biochemistry*. 2002.
<www.wiley.com/legacy/college/boyer/0470003790/animations/animations.htm>.

Sample Two-Page Layout

The following clarification on reading the document format is based on a sample two-page layout from *Grade 11 Biology: A Foundation for Implementation*.

Indicates the biology topic.

Specific learning outcome (SLO) statements define what students are expected to achieve by the end of Grade 11 Biology.

GRADE 11 BIOLOGY • *Unit 1: Wellness and Homeostasis*

PERSONAL WELLNESS

SLO: B11-1-01
SLO: B11-1-02
SLO: B11-1-03

SPECIFIC LEARNING OUTCOMES

B11-1-01: Increase awareness of personal wellness, as well as personal and family health history. (GLO: B3)

B11-1-02: Develop a personal wellness plan. (GLOs: B3, B5)

B11-1-03: Recognize how individual wellness choices affect others. (GLOs: B3, B5)

Examples: community, family...

SUGGESTIONS FOR INSTRUCTION

TEACHER NOTE

The instructional strategies suggested in this document follow the constructivist model of learning and are organized into two groups: activate and acquire/apply. By activating students' prior knowledge of a topic, teachers can

- help students relate new information, skills, and strategies to what they already know and can do
- recognize misconceptions and gaps in student knowledge
- stimulate curiosity and initiate the inquiry process

Acquiring and applying strategies are designed to assist students in processing, integrating, and consolidating their learning.


Wellness Portfolio

Wellness is a major theme in Grade 11 Biology. A recommended students explore this theme is the creation of a Wellness Portfolio. In their portfolios, students personalize the human body content in Biology programming. The intent is to have students learn more medical histories and how their body works, to collect data on health performing, to analyze how well they are taking care of themselves decisions about their own lifestyle to promote their wellness.

This portfolio has a number of possible assignments in a variety matched up to an appropriate section of the course. Appendix 1.1: Wellness Portfolio Overview provides a summary of possible Wellness Portfolio activities or assignments. Additional assignments can be added by the teacher.

All students should complete Appendix 1.2: Wellness Checkup (BLM). Other work could be teacher assigned, a combination of teacher assigned and student selected, or all student selected.

The Wellness Portfolio activities and assignments are referenced throughout this document and can be identified by the following graphic:



The first alpha-numeric code indicates course (Grade 11 Biology); second digit indicates topic number; and third digit(s) indicate(s) specific learning outcome number.

Suggestions for student learning experiences relate directly to the attainment of the specific learning outcome(s).

Include: Indicates a mandatory component of the specific learning outcome, or a defined set of limitations. (These specific learning outcomes do not contain this component.)

Examples: Provide ideas of what could be included (non-mandatory).

Notes provide teachers with background information, definitions, planning hints, special-interest material, and information on depth of treatment of certain issues. Safety information and cautions are included.

4 – Wellness and Homeostasis

Skills and attitudes learning outcomes define expectations across all topics in Grade 11 Biology.

GRADE 11 BIOLOGY • Unit 1: Wellness and Homeostasis

SKILLS AND ATTITUDES OUTCOMES

- B11-0-P2:** Demonstrate a willingness to reflect on personal wellness. (GLO: B3)
- B11-0-I1:** Synthesize information obtained from a variety of sources. (GLOs: C2, C4, C6)
Include: print and electronic sources, resource people, and personal observations
- B11-0-I4:** Communicate information in a variety of forms appropriate to the audience, purpose, and context. (GLOs: C5, C6)

ACTIVATE



Wellness Checkup

As an introduction to some of the factors that influence wellness, have students complete Appendix 1.2: Wellness Checkup (BLM).

ACQUIRE/APPLY



Once Upon a Time—Microtheme (I4)

Microthemes are short writing assignments designed to help students learn the material by looking at it in a different way (Martin). Refer to Appendix 1.3A: Microthemes (Teacher Background) for more information on microthemes, including assessment approaches.

Provide students with the following microtheme assignment:

Microtheme

Remember a time when you broke your leg sliding into home plate, or how itchy you were that summer vacation when you broke out in chicken pox? What illnesses or injuries have you experienced? Choose one of these incidents to write about. Imagine that you are now a grandparent invited to your grandson's Kindergarten class to talk to students about that illness or injury. Write down what you would tell them. Be sure to include what happened, how you were diagnosed and treated, whether you visited the hospital, and so on. Your account can be dramatic, but it must also be factual.

Option: If you suffer from a chronic disease, you may choose to write about that.

Resource

Life Is a Gift: A Manitoba Grade 11 Biology Resource for Organ Donation and Transplantation (Manitoba Education and Transplant Manitoba) provides a context in which to incorporate the science and issues surrounding organ donation into teaching and learning in each of the six units of the Grade 11 Biology curriculum.

See *Organs and Tissues Available for Transplant Lesson Plan* in *Life Is a Gift* for learning activities linked to Unit 1: Wellness and Homeostasis.



Suggestion for Assessment

Refer to Appendix 1.3B: Microthemes – First Draft Checklist (BLM) and Appendix 1.3C: Microthemes – Final Draft Assessment (BLM) for assessment tools.

Code refers to skills and attitudes learning outcome(s).

Suggested strategies relate directly to assessing student achievement of the specific learning outcome(s).

Resource links indicate the titles, authors, and page references (or URLs) where SLO-related content is treated within the various learning resources.

NOTES