

Science Essentials 10

Teacher's Resource

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To the Teacher

Welcome to *Science Essentials 10*, a program specifically designed for use with students in Locally Developed Compulsory Credit Courses for Grade 10 Science (SNC2L). The material in the *Science Essentials 10 Student Resource*, this *Teacher's Resource*, and the *Teacher's CD* more than covers all of the expectations listed in the ministry guidelines for this course. A correlation at the beginning of this *Teacher's Resource* provides detailed information about where and how often each expectation has been handled.

Before you start planning, take a few minutes to review a sample section in the *Science Essentials 10 Student Resource* and the related notes in the *Teacher's Resource*.

- The *Teacher's Resource* includes 75 overhead transparencies that will assist you in discussing key visuals, completing graphic organizers, and planning investigations with students. You may wish to photocopy some of these overhead transparencies for use with LD students.
- Note how each lesson in the *Student Resource* starts with a list of Key Terms that provides necessary vocabulary for that lesson.
- Other literacy aspects of the *Science Essentials 10 Student Resource* are outlined in the introduction to the *Teacher's Resource* under "Science and Literacy".
- The Activity Planning Notes in the *Teacher's Resource* provide helpful teaching suggestions.
- Accommodations provide ideas for customizing the material for students with specific learning styles or learning difficulties.
- Ongoing Assessment provides ideas for formative assessment.
- The Assessment Master folder of the *Teacher's CD* provides a number of generic checklists and rubrics that will assist you in assessing students and their work.
- There are many hands-on activities throughout the *Student Resource*, including Test It!, Find Out, and What's Going On? sections. Each of these types of activities provides students with concrete reinforcement of the related expectations.
- Science and Math Links help students with calculations.
- Since learning to develop investigations is an important aspect of the SNC2L curriculum, the Test It! activities expect students to do more and more of their own planning for investigations. To assist you with coaching, there are overhead transparencies for every Test It! in How to Think Like a Scientist and Unit A.
- Alternative Activities at the end of each section provide additional ideas for hands-on experiences that will help students deepen and extend their understanding.

Many alternative activities have a related Technology Link. These links are checked and updated regularly, and are mounted on the McGraw-Hill Ryerson web site at www.mcgrawhill.ca/books/Se10.

The first time you enter the site, use the following username and password:

Username: sci10_ess

Password: 10teacher

Once you log in, you will be prompted to create your own unique username and password.

Each chapter ends with a Chapter Review. A related Practice Test BLM provides additional reinforcement for students who need it. The Final Test for the chapter uses the same instructions and similar questions as the Chapter Review and Practice Test. This plan allows students to deal with science concepts and skills without being distracted by literacy issues.

The *Student Resource* has a Unit Task at the end of each unit. The Unit A Task includes a Science and Literacy Link that provides students with additional literacy experience. The Units B, C, and D Task sections include Science and Media Links that will help students meet the Science in Media expectations.

All BLMs are in both PDF and Word formats. You can customize the worksheets by adding or subtracting scaffolding, and changing the wording to provide additional or more/less challenging questions, depending on the range of reading and learning levels of your particular class.

We feel confident that these materials will assist you and your students in handling the Science Essentials program.

The Authors and Advisors for *Science Essentials 10*

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Overhead Transparencies

This package has 75 overhead transparencies. Some of these overhead transparencies include key visuals and important charts from the student resource. They also include the entire text of Test It! activities in How to Think Like a Scientist and Unit A. You can use these to coach your students in developing their own investigations, which is a key component of this course.

OHT 1	Creating a Narrative Lab Report
OHT 2	Writing an Opinion Paragraph
OHT 3	Centimetre Grid
OHT 4	Safety Precaution Symbols
OHT 5	PMI Chart
OHT 6	Test It! Paper Towel Test, Part 1
OHT 7	Test It! (continued)
OHT 8	Types of Variables
OHT 9	Test It! Paper Towel Test, Part 2
OHT 10	Test It! (continued)
OHT 11	Test It! (continued)
OHT 12	Scientific Method
OHT 13	Compare Energy Drinks
OHT A-1	Daily Chemistry
OHT A-2	Information Please
OHT A-3	WHMIS Labels
OHT A-4	Periodic Table
OHT A-5	WHMIS Symbols
OHT A-6	Compare Flammable and Combustible
OHT A-7	Making and Diluting a Solution
OHT A-8	Identifying Physical Changes and Chemical Changes
OHT A-9	Surface Area
OHT A-10	Test It! Big or Small: Faster or Slower?
OHT A-11	Test It! (continued)
OHT A-12	Test It! Concentrated or Dilute: Faster or Slower?
OHT A-13	Test It! (continued)
OHT A-14	Test It! Hot or Cold: Faster or Slower?
OHT A-15	Test It! (continued)
OHT A-16	Test It! (continued)
OHT A-17	Compare Catalysts and Inhibitors
OHT A-18	Plastics in Your Life
OHT A-19	Types of Plastic
OHT A-20	Plastics, Health, and the Environment
OHT A-21	Test It! Pop the Top!
OHT A-22	Test It! (continued)

OHT A-23	Test It! (continued)
OHT B-1	Electricity
OHT B-2	Parts of a Circuit and Circuit Symbols
OHT B-3	Measuring Current
OHT B-4	Building Circuits Checklist
OHT B-5	Calculate the Power Used
OHT B-6	Calculate the Power Used (continued)
OHT B-7	Calculate Your Cost
OHT B-8	Calculate Your Cost (continued)
OHT B-9	How Do Electric Generators Work?
OHT B-10	Electric Energy and the Environment
OHT B-11	Energy Consumption
OHT B-12	EnerGuide Ratings
OHT B-13	Comparing Costs
OHT B-14	Comparing Costs (continued)
OHT B-15	Energy Consumption at Home
OHT B-16	School Energy Audit
OHT B-17	Reducing Energy Consumption
OHT C-1	Interacting Together
OHT C-2	Estimating Beans
OHT C-3	Factors that Affect the Size of a Population
OHT C-4	Survivor Game Board
OHT C-5	Draining a Wetland to Build a Mall
OHT C-6	Microscope Checklist
OHT C-7	Spreading Disease
OHT C-8	Park Ecosystem
OHT C-9	Producers and Consumers
OHT C-10	Food Chains and Food Webs
OHT C-11	Lynx and Hare Graph
OHT C-12	Endangered Species Ad
OHT C-13	Second-Hand Smoke Ad
OHT C-14	Compare Packaging
OHT C-15	Reduce Waste at School
OHT D-1	Examples of Advertising Techniques
OHT D-2	Advertising Claims
OHT D-3	Compare Food Labels
OHT D-4	What Causes Heartburn?
OHT D-5	pH Scale
OHT D-6	Unfinished Claim
OHT D-7	Which Laundry Detergent Cleans Better in Cold Water?

Blackline Masters

This package has generic masters, chapter-specific masters, and assessment masters available on the *Science Essentials 10* Teacher's Resource CD-ROM. All masters are available in Microsoft Word and PDF format. Use the Microsoft Word format to customize any master for your specific group of students.

Generic Masters

Master 1	Narrative Lab Report
Master 2	Writing an Opinion Paragraph
Master 3	Centimetre Grid Paper
Master 4	Safety Precaution Symbols
Master 5	Certificate
Master 6	List of Skills

How to Think Like a Scientist

BLM Intro-1	Advertising Techniques
BLM Intro-2	Show You Know! Measuring the Volume of Water Using a Graduated Cylinder
BLM Intro-3	Test It! Balanced Golf Balls, Part 1 and Part 2
BLM Intro-4	I Found It on the Internet
BLM Intro-5	BLM Answers

Chapter 1

BLM 1-1	Predict, Explain, Observe, Explain
BLM 1-2	How Do Acids React with Shells?
BLM 1-3	Make a Flyer for a Common Chemical
BLM 1-4	Compare Flammable and Combustible
BLM 1-5	Chapter 1 Practice Test
BLM 1-6	Chapter 1 Test
BLM 1-7	BLM Answers

Chapter 2

BLM 2-1	States of Matter
BLM 2-2	Calculate Amounts for Solutions
BLM 2-3	Parts of a Chemical Change
BLM 2-4	Find Out: Prepare a Foam
BLM 2-5	Chapter 2 Practice Test
BLM 2-6	Chapter 2 Test
BLM 2-7	BLM Answers

Chapter 3

BLM 3-1	Burning Rate of Candles
BLM 3-2	Cube Templates
BLM 3-3	Factors Affecting Rate of Change
BLM 3-4	Making a Bar Graph
BLM 3-5	Making a Bar Graph in Microsoft® Excel
BLM 3-6	Temperature
BLM 3-7	Making a Line Graph
BLM 3-8	Making a Line Graph in Microsoft® Excel
BLM 3-9	Compare Catalysts and Inhibitors
BLM 3-10	Teacher Demonstration: A Catalyst in a Chemical Change
BLM 3-11	Chapter 3 Practice Test
BLM 3-12	Chapter 3 Test
BLM 3-13	BLM Answers

Chapter 4

BLM 4-1	Back It Up
BLM 4-2	PMI Chart
BLM 4-3	It's Up to You
BLM 4-4	Chapter 4 Practice Test
BLM 4-5	Chapter 4 Test
BLM 4-6	BLM Answers

Chapter 5

BLM 5-1	Understanding Electric Energy
BLM 5-2	Show You Know! Working with LEDs
BLM 5-3	Voltage in a Circuit
BLM 5-4	All Kinds of Energy
BLM 5-5	Calculate the Power Used
BLM 5-6	Calculate Your Cost
BLM 5-7	LED Home Audit
BLM 5-8	Chapter 5 Practice Test
BLM 5-9	Chapter 5 Test
BLM 5-10	BLM Answers

Chapter 6

BLM 6-1	Researching Batteries
BLM 6-2	Chapter 6 Practice Test
BLM 6-3	Chapter 6 Test
BLM 6-4	BLM Answers

Chapter 7

BLM 7-1	Pinwheel Template
BLM 7-2	Build an Electric Generator
BLM 7-3	Chapter 7 Practice Test
BLM 7-4	Chapter 7 Test
BLM 7-5	BLM Answers

Chapter 8

BLM 8-1	Comparing Costs
BLM 8-2	Energy Consumption
BLM 8-3	Dial Meter Readings
BLM 8-4	Smart Meter Readings
BLM 8-5	Chapter 8 Practice Test
BLM 8-6	Chapter 8 Test
BLM 8-7	BLM Answers

Unit B Task

BLM B-1	Power Rating Conversions
BLM B-2	Design a School Energy Plan

Chapter 9

BLM 9-1	The Name Game
BLM 9-2	Using Mass to Estimate a Population
BLM 9-3	Counting Populations of Plants
BLM 9-4	Making an Action Plan
BLM 9-5	Survivor Game Board
BLM 9-6	Acid Rain
BLM 9-7	Test It! What are the Limits for Seeds?
BLM 9-8	Show You Know! Microscope Certification
BLM 9-9	How Fast Does Yeast Grow?
BLM 9-10	Calculating Population Density
BLM 9-11	Chapter 9 Practice Test
BLM 9-12	Chapter 9 Test
BLM 9-13	BLM Answers

Chapter 10

BLM 10-1	Should Students Work Together?
BLM 10-2	Research and Report on Roles in an Animal Community
BLM 10-3	Ants at Work
BLM 10-4	Research Safe Practices
BLM 10-5	Spreading Disease
BLM 10-6	Chapter 10 Practice Test

- BLM 10–7 Chapter 10 Test
- BLM 10–8 BLM Answers

Chapter 11

- BLM 11–1 Build an Ecosystem
- BLM 11–2 Worm Composting
- BLM 11–3 Symbiotic Relationships
- BLM 11–4 Stoop and Scoop
- BLM 11–5 Symbiosis
- BLM 11–6 Chapter 11 Practice Test
- BLM 11–7 Chapter 11 Test
- BLM 11–8 BLM Answers

Chapter 12

- BLM 12–1 Role-Play a Press Conference
- BLM 12–2 Analyze Ads
- BLM 12–3 Case Study: Two Islands
- BLM 12–4 Chapter 12 Practice Test
- BLM 12–5 Chapter 12 Test
- BLM 12–6 BLM Answers

Unit C Task

- BLM C–1 Research Waste Materials
- BLM C–2 Develop a Survey

Chapter 13

- BLM 13–1 Blank Nutrition Facts Labels
- BLM 13–2 Try This! Charts
- BLM 13–3 Testing for Fats in Foods
- BLM 13–4 Calculating the Density of Coke Classic™ and Diet Coke™
- BLM 13–5 Acid Reflux
- BLM 13–6 Neutralizing Acids
- BLM 13–7 Chapter 13 Practice Test
- BLM 13–8 Chapter 13 Test
- BLM 13–9 BLM Answers

Chapter 14

- BLM 14–1 Hazardous Household Product Symbols
- BLM 14–2 Homemade Hand Cream
- BLM 14–3 Plant Fertilizers
- BLM 14–4 Chapter 14 Practice Test
- BLM 14–5 Chapter 14 Test
- BLM 14–6 BLM Answers

Assessment Masters

Assessment Master 1	Co-operative Group Work Checklist
Assessment Master 2	Co-operative Group Work Rubric
Assessment Master 3	Lab Report Checklist
Assessment Master 4	Lab Report Rubric
Assessment Master 5	Scientific Communication Checklist
Assessment Master 6	Scientific Communication Rubric
Assessment Master 7	Safety Checklist
Assessment Master 8	Safety Rubric
Assessment Master 9	Using Tools and Equipment Checklist
Assessment Master 10	Using Tools and Equipment Rubric
Assessment Master 11	Fair Test Checklist
Assessment Master 12	Fair Test Rubric
Assessment Master 13	Oral Presentation Checklist
Assessment Master 14	Oral Presentation Rubric
Assessment Master 15	Visual Presentation Checklist
Assessment Master 16	Visual Presentation Rubric
Assessment Master 17	Narrative Lab Report Checklist

Curriculum Correlation

Expectation	Science Essentials 10
Scientific Inquiry: Science in Media	
SIMV.01 – explain how science-related information is presented in print and electronic media for different purposes and audiences	How to Think Like a Scientist (pages 2–15) Unit A (pages 16–97), Chapter 1 (pages 20–39) Unit B (pages 98–179) Unit C (pages 180–273) Unit D (pages 274–315), Chapter 13 (pages 278–295), Chapter 14 (pages 296–315)
SIMV.02 – investigate science-related information presented in print and electronic media using appropriate research and reporting skills	How to Think Like a Scientist (pages 2–15) Chapter 1 (pages 20–39), Chapter 4 (pages 74–97) Unit B (pages 98–179), Chapter 6 (pages 122–139), Chapter 7 (pages 140–157) Unit D (pages 274–315), Chapter 13 (pages 278–295), Chapter 14 (pages 296–315)
SIMV.03 – evaluate claims and presentations of science-related information in media	How to Think Like a Scientist (pages 2–15) Unit A (pages 16–97), Chapter 1 (pages 20–39), Chapter 4 (pages 74–97) Chapter 7 (pages 140–157), Chapter 8 (pages 158–179) Chapter 12 (pages 250–273) Unit D (pages 274–315), Chapter 13 (pages 278–295), Chapter 14 (pages 296–315)
SIM1.01 – identify the ways in which scientific information is conveyed	1.1–1.3 (pages 21–37), 2.2 (pages 42–47), 4.2 (pages 76–77), 4.4 (pages 80–89), 8.1 (pages 159–163), Unit B Task (pages 176–179), 12.2–12.3 (pages 255–265), Unit C Task (pages 268–273), 13.1–13.3 (pages 280–293), 14.2 (pages 306–311), Unit D Task (pages 314–315)
SIM1.02 – discuss, using examples, how the method of presenting scientific information connects to the purpose	1.1 (pages 21–23), 1.3 (pages 26–37), 2.2 (pages 42–47), 13.3 (pages 290–293), 14.2 (pages 306–311), Unit D Task (pages 314–315)
SIM1.03 – explain how different formats used in the media to present science information target specific audiences	1.1 (pages 21–23), Unit A Task (pages 92–97), Unit C (pages 180–273), 12.2–12.3 (pages 255–265), Unit C Task (pages 268–273), 13.1 (pages 280–285), 13.3 (pages 290–293), 14.1–14.2 (pages 298–311), Unit D Task (pages 314–315)
SIM2.01 – formulate testable questions on science-related claims and conduct investigations based on the concept of a fair test	What Makes a Fair Test? (pages 4–8), 3.2–3.3 (pages 58–64), Unit A Task (pages 92–97), 13.2 (pages 286–289), 14.1–14.2 (pages 298–311)
SIM2.02 – research science-related information from a variety of electronic and other sources	Scientific Method (page 9), Media Literacy (pages 11–15), 1.3 (pages 26–37), 4.4 (pages 80–89), 6.2–6.3 (pages 128–137), 8.2 (pages 164–169), 11.2–11.3 (pages 240–247), 12.1–12.3 (pages 251–265), Unit C Task (pages 268–273), 13.3 (pages 290–293), Unit D Task (pages 314–315)

Expectation	<i>Science Essentials 10</i>
SIM2.03 – interpret research data, including analysis for accuracy and bias as appropriate, using a range of strategies for reading for information	What Makes a Fair Test? (pages 4–8), Media Literacy (pages 11–15), 3.2–3.3 (pages 58–64), 3.5 (pages 69–71), 4.4 (pages 80–89), 6.2–6.3 (pages 128–137), 7.3 (pages 150–155), Unit B Task (pages 176–179), Unit C Task (pages 268–273), Unit D Task (pages 314–315)
SIM2.04 – organize and communicate information collected from lab investigations and information research using graphic organizers	What Makes a Fair Test? (pages 4–8), Media Literacy (pages 11–15), 1.1 (pages 21–23), 1.3 (pages 26–37), 2.1–2.2 (pages 41–47), 2.4 (pages 50–53), 3.2–3.5 (pages 58–71), Unit A Task (pages 92–97), 7.1–7.3 (pages 141–155), 9.3 (pages 196–203), 10.1 (pages 215–221), 12.2–12.3 (pages 255–265), 13.2 (pages 286–289), 14.2 (pages 306–311), Unit D Task (pages 314–315)
SIM3.01 – formulate testable questions about science-related claims and representations in the media	Advertising Claims (page 10), Media Literacy (pages 11–15), 3.2 (pages 58–61), 13.1–13.3 (pages 280–293), 14.1–14.2 (pages 298–311)
SIM3.02 – develop procedures to assess these claims and representations, using information research and/or laboratory investigations	Advertising Claims (page 10), Media Literacy (pages 11–15), 3.2 (pages 58–61), 13.1–13.3 (pages 280–293), 14.1–14.2 (pages 298–311)
SIM3.03 – evaluate the investigation and suggest improvements	Unit A Task (pages 92–97), 13.3 (pages 290–293), 14.1–14.2 (pages 298–311)
SIM3.04 – communicate science-related information to a workplace audience	8.3 (pages 170–173), Unit B Task (pages 176–179), 9.3 (pages 196–203), 10.3 (pages 224–229), 13.3 (pages 290–293), 14.1–14.2 (pages 298–311), Unit D Task (pages 314–315)
Chemistry: Interactions of Common Materials	
CIMV.01 – understand how chemicals in common household and workplace materials interact	Unit A (pages 16–97), Chapter 1 (pages 20–39), Chapter 2 (pages 40–55), Chapter 3 (pages 56–73), Chapter 4 (pages 74–97)
CIMV.02 – investigate the types and rates of interactions between commonly used materials through laboratory activities	Unit A (pages 16–97), Chapter 2 (pages 40–55), Chapter 3 (pages 56–73)
CIMV.03 – analyse how material interactions affect our daily lives	Unit A (pages 16–97), Chapter 2 (pages 40–55), Chapter 3 (pages 56–73), Chapter 4 (pages 74–97)
CIM1.01 – recognize the relationships among chemical formulae, composition, and common names	1.1–1.2 (pages 21–25)
CIM1.02 – classify chemicals into groups according to their behaviour, using appropriate scientific terminology	1.3 (pages 26–37)

Expectation	<i>Science Essentials 10</i>
CIM1.03 – distinguish between chemical reactions and physical processes, using appropriate scientific terminology	2.1 (page 41), 2.3–2.4 (pages 48–53), 3.2–3.5 (pages 58–71), Unit A Task (pages 92–97)
CIM1.04 – identify the factors that alter the rate of physical processes and chemical reactions	3.1–3.5 (pages 57–71), Unit A Task (pages 92–97)
CIM2.01 – select and use appropriate lab equipment and apply WHMIS safety procedures for the handling, storage, disposal, and recycling of laboratory materials	1.3 (pages 26–37), 2.4 (pages 50–53), 3.2–3.4 (pages 58–68), Unit A Task (pages 92–97)
CIM2.02 – conduct experiments to investigate how materials can interact chemically	1.3 (pages 26–37), 2.1 (page 41), 2.4 (pages 50–53), 3.2–3.5 (pages 58–71), Unit A Task (pages 92–97)
CIM2.03 – conduct experiments to investigate how materials can interact physically	2.1–2.2 (pages 41–47), 2.4 (pages 50–53), 3.2 (pages 58–61), 3.4 (pages 65–68)
CIM2.04 – conduct experiments to determine the factors affecting rates of chemical reactions and physical processes	3.2–3.5 (pages 58–71)
CIM2.05 – communicate the results of investigations using a variety of oral, written, and graphic formats	1.1 (pages 21–23), 1.3 (pages 26–37), 2.1–2.2 (pages 41–47), 2.4 (pages 50–53), 3.2 (pages 58–61), 3.3–3.5 (pages 62–71), Unit A Task (pages 92–97)
CIM3.01 – research the interactions of materials that are used in daily life	1.3 (pages 26–37), 2.2 (pages 42–47), 3.2 (pages 58–61), 3.5 (pages 69–71), 4.4 (pages 80–89)
CIM3.02 – analyse the costs and benefits of a specific material with reference to its interactions with other materials in the environment	2.2 (pages 42–47), 4.1–4.4 (pages 75–89), Unit A Task (pages 92–97)
CIM3.03 – communicate an opinion, supported by evidence, about the use of a particular material, with consideration for both its physical and chemical interactions	4.1–4.4 (pages 75–89), Unit A Task (pages 92–97)
Biology: Living Together	
BLTV.01 – explain the strategies that organisms use for successful coexistence in populations and communities	Chapter 10 (pages 214–231), Chapter 11 (pages 232–249)
BLTV.02 – investigate, using appropriate laboratory and research skills, the implications of organisms existing in communities	Chapter 9 (pages 184–213)

Expectation	<i>Science Essentials 10</i>
BLTV.03 – analyse the challenges that arise from organisms living in communities	Unit C (pages 180–273), Chapter 10 (pages 214–231), Chapter 12 (pages 250–273)
BLT1.01 – summarize the potential benefits of organisms living together in communities	10.2 (pages 222–223)
BLT1.02 – identify challenges that arise from organisms living together in communities, including human populations	9.1–9.4 (pages 185–211), 10.3 (pages 224–229), 11.1–11.3 (pages 233–247), 12.1–12.3 (pages 251–265)
BLT1.03 – compare the strategies used by various communities of organisms to successfully coexist	10.1 (pages 215–221), 11.2–11.3 (pages 240–247)
BLT1.04 – use appropriate scientific terminology related to concepts of organisms living together	9.1–9.4 (pages 185–211), 10.1–10.3 (pages 215–229), 11.1–11.3 (pages 233–247), 12.1–12.3 (pages 251–265), Unit C Task (pages 268–273)
BLT2.01 – plan and conduct an experiment to investigate the results of overcrowding in microscopic populations including estimation and measurement of population size	9.4 (pages 204–211)
BLT2.02 – plan and conduct an experiment to investigate the results of overcrowding in macroscopic populations	9.4 (pages 204–211)
BLT2.03 – make accurate observations of the organisms that exist in a community, using a microscope	9.4 (pages 204–211), 10.1 (pages 215–221)
BLT2.04 – make observations, directly or using technologies, to determine the benefits and challenges of living in communities	10.1 (pages 215–221), 10.3 (pages 224–229)
BLT2.05 – use a variety of research strategies to determine the roles of specific organisms within a community	10.1 (pages 215–221)
BLT2.06 – explain and interpret observations by summarizing patterns obtained from graphing data, organizing information, and communicating orally and in writing	9.1–9.4 (pages 185–211), 10.1 (pages 215–221), 10.3 (pages 224–229), 11.1 (pages 233–239), 12.3 (pages 260–265), Unit C Task (pages 268–273)
BLT3.01 – develop a simple action plan, using a consistent written format, to address an environmental concern	9.2 (pages 192–195), 12.3 (pages 260–265), Unit C Task (pages 268–273)
BLT3.02 – determine, through a case study, and explain how humans organize their communities to address challenges of living together	11.3 (pages 244–247), 12.1 (pages 251–254), 12.3 (pages 260–265)

Expectation	<i>Science Essentials 10</i>
Physics: Using Electrical Energy	
PEEV.01 – explain the generation, measurement, and conversion of electricity	Unit B (pages 98–179), Chapter 5 (pages 102–121), Chapter 6 (pages 122–139), Chapter 7 (pages 140–157)
PEEV.02 – investigate the factors that affect the generation and use of electricity	Chapter 6 (pages 122–139), Chapter 7 (pages 140–157), Chapter 8 (pages 158–179)
PEEV.03 – analyse the social, economic, and/or environmental implications of the sources and uses of electrical energy	Chapter 6 (pages 122–139), Chapter 7 (pages 140–157), Chapter 8 (pages 158–179)
PEE1.01 – describe different methods of generating electricity from other forms of energy	6.1–6.2 (pages 123–133), 7.1–7.3 (pages 141–155)
PEE1.02 – define and describe electrical concepts and their units	5.1 (pages 103–109), 5.3 (pages 113–119), 6.2–6.3 (pages 128–137)
PEE1.03 – determine quantitatively and/or qualitatively the energy and power associated with electrical devices	5.3 (pages 113–119), 6.1–6.2 (pages 123–133), 7.1 (pages 141–145), 8.1–8.2 (pages 159–169)
PEE1.04 – identify the range of uses for electrical energy in our society and the energy conversions involved	5.2–5.3 (pages 110–119)
PEE2.01 – locate and select information from various sources to identify factors affecting generation and use of electricity	5.1–5.2 (pages 103–112), 6.2 (pages 128–133), 7.2–7.3 (pages 146–155), 8.2–8.3 (pages 164–173), Unit B Task (pages 176–179)
PEE2.02 – design and build an electrical device, using lab equipment and materials safely	6.2–6.3 (pages 128–137), 7.1 (pages 141–145)
PEE2.03 – modify the electrical device they built to increase the amount of electrical energy it produces	6.2 (pages 128–133), 7.1 (pages 141–145)
PEE2.04 – determine and record the electrical energy and power of electrical devices	5.3 (pages 113–119), 6.2 (pages 128–133), 8.1–8.3 (pages 159–173)
PEE2.05 – communicate information using appropriate formats for specific purposes and audiences	5.1–5.2 (pages 103–112), 6.1–6.3 (pages 123–137), 7.1–7.2 (pages 141–149), 8.1–8.3 (pages 159–173), Unit B Task (pages 176–179)
PEE3.01 – compare technologies used for generating electrical energy, including their social, economic, or environmental implications	6.3 (pages 134–137), 7.2–7.3 (pages 146–155), Unit B Task (pages 176–179)
PEE3.02 – design and implement a plan to reduce electrical consumption at home, at school, or in a workplace, based on identified consumption patterns	8.3 (pages 170–173), Unit B Task (pages 176–179)

Science and Literacy

Traditionally, teaching skills of reading and writing was left to elementary and middle school teachers. It was thought that this was sufficient to prepare learners for secondary school. Research has revealed that important learning of literacy skills can occur throughout an adolescent's schooling. Because of this, we now know that explicit instruction in reading and writing can benefit high school students, and that this instruction can play a pivotal role in the academic success of weak readers and writers. With this in mind *Science Essentials 10* builds on the strengths of the literacy program in *Science Essentials 9*.

Science and Literacy Links

As in *Science Essentials 9*, the *Science Essentials 10* Student Resource has a Science and Literacy Link feature.

Science and Literacy Link	Synopsis	Literacy Connection
Creating a Narrative Lab Report (page 8)	<p>The narrative lab report demands the same kind of information that a traditional lab report requires, but organizes the demands into four understandable questions that students must weave into a story:</p> <ol style="list-style-type: none"> 1. What was I looking for? 2. How did I look for it? 3. What did I find out? 4. What does this mean? 	<ul style="list-style-type: none"> • Scientists have a solid grasp of the concepts and principles they are writing about. The purpose of their research is clear before they begin. • The opposite is true of science students. Their foundation of conceptual understanding is only emerging. The traditional lab report does not serve to help them learn. In fact, the highly structured abstract format is an obstacle to learning. • When writing lab reports is perceived as an arduous meaningless task, the entire enterprise of learning science by reading textbooks, understanding science notes, and engaging in true inquiry by formulating scientific questions is put at risk. • The narrative lab report focuses on student strengths in writing. It dispenses with the formalism of past passive, and engages the students in the use of the first-person perspective to match their strength in the narrative mode of speech, taking into account their developmental stage as adolescent learners who are moving from the concrete to formal stages of thinking. • Master 1 Narrative Lab Report, which is in the generic masters, and OHT 1 Creating a Narrative Lab Report provide the same outline as that on page 8. This master and overhead transparency can be used when you feel that students would benefit from writing up a narrative lab report. The Teacher's Resource provides suggestions for when to use this material.

Science and Literacy Link	Synopsis	Literacy Connection
Everyday Chemicals (page 23)	These three paragraphs describe two students' daily activities. In the narrative, the common names that reference chemicals are replaced by their chemical names.	<ul style="list-style-type: none"> As students read, they underline words that refer to chemicals. This activity helps students connect their knowledge of common names of chemicals to the substances' chemical names. Students are asked to replace the chemical words with the common names and re-read the paragraphs. They then check the side of a can of cola and write the chemical names to replace the common names. Recognizing that there are several terms for the same thing is an important language skill.
Painting the Ceiling Pink: Colour-Changing Technology (page 31)	A short reading provides an application of the science involved in What's Going On? Invisible Ink. Students read about how acids, bases, and indicators can be used in a practical situation.	<ul style="list-style-type: none"> Check Your Understanding questions focus on information directly in the text. A Making Connections question asks students to draw conclusions about what they have read using what they learned in the What's Going On? activity.
Alternative Fuels (page 37)	Two brief readings provide an overview of fossil fuels and biofuels.	<ul style="list-style-type: none"> Check Your Understanding questions focus on information directly in the text.
Body in a Bog (page 64)	This reading explains the science behind a body preserved in a peat bog for 2000 years.	<ul style="list-style-type: none"> As students read, they underline connections between concentration and rate of chemical change, both concepts that were studied earlier. Students use a chart to help summarize the key ideas. Summarizing information is a key literacy skill; students need multiple opportunities to develop this skill.
Carbon Monoxide and Catalytic Converters (page 71)	This full-page article discusses the need for and science of catalytic converters.	<ul style="list-style-type: none"> A short anticipation guide elicits students' prior knowledge, and requires students to reflect on their initial responses after they finish reading. A visual and caption reinforce the scientific explanation.
Rocket Fuels (page 96)	Students study two advertisements: one for solid fuel and one for liquid fuel.	<ul style="list-style-type: none"> Summarizing information in chart form is difficult for weak readers. They require cues to support them in the task. Here, as students read, they circle positive characteristics of each fuel and underline the negative characteristics. They then translate what they have selected into a PMI chart.

Science and Literacy Link	Synopsis	Literacy Connection
Energy and the Environment (page 150)	This is a discussion of the advantages and disadvantages of fossil fuels, hydroelectric power, and nuclear power.	<ul style="list-style-type: none"> Summarizing information in chart form is difficult for weak readers. As in the Science and Literacy Link on page 96 in the student resource, students circle the advantages of each technology and underline the disadvantages. They then translate what they have selected into a PMI chart.
Energy Savings Tips (page 171)	Tips in the form of a checklist involve students in examining energy consumption and efficiency in their homes.	<ul style="list-style-type: none"> After completing the checklist for their own home, students are asked to reflect on each item by identifying the energy-saving tips that improve energy efficiency. Returning to the list with a purpose helps students consolidate their knowledge.
FrogWatch (page 193)	Students read a single paragraph that explains the purpose of watching frogs.	<ul style="list-style-type: none"> Students are required to follow web links and develop a Frog Watch action plan. Students need to practise reading and writing with a purpose, particularly using technology. BLM 9–4 Making an Action Plan is a related worksheet that assists students in writing an action plan. This worksheet is available on your teacher CD; this teacher’s resource provides suggestions for using it.
Research and Report on Roles in an Animal Community (page 215)	This is a traditional research assignment in which students interview an expert or use the library or Internet.	<ul style="list-style-type: none"> This research assignment focuses on making a list of different roles, and explaining how each role helps the community survive. BLM 10–2 Research and Report on Roles in an Animal Community is a related worksheet that assists students in researching roles and then writing a paragraph about them. This worksheet is available on your teacher CD; this teacher’s resource provides suggestions for using it.
Health at Risk From Disease (page 228)	This is a short article on health risks from animal diseases.	<ul style="list-style-type: none"> Students are asked to scan a question before reading. They then use highlighting to identify the information required to answer the question. Students use what they have learned in the article to classify two visuals of populations according to which group is at greater risk of getting the bird flu. The Find Out: Spreading Disease that follows has students analyze maps to identify how the bird flu spread between 2004 and 2006.

Science and Literacy Link	Synopsis	Literacy Connection
Worm Composting (page 241)	This is a traditional research assignment in which students find information on composting.	<ul style="list-style-type: none"> Students are asked to create a brochure to promote composting. This addresses asking students to write using a variety of forms for a variety of purposes. Completing this research activity helps students develop skills for the page 262 Science and Literacy Link, Develop an Action Plan. BLM 11–2 Worm Composting is a related worksheet that assists students in identifying the information they need to find and provides a checklist to help them develop a useful brochure. This worksheet is available on your teacher CD; this teacher’s resource provides suggestions for using it.
Case Study: Stoop and Scoop (page 246)	This brief case study explains the importance of handling dog waste appropriately.	<ul style="list-style-type: none"> Students answer one “why” question. They then research the regulations in their own community and create a poster promoting the stoop and scoop program. BLM 11–4 Stoop and Scoop is a related worksheet that assists students in doing the necessary research and planning a poster. This worksheet is available on your teacher CD; this teacher’s resource provides suggestions for using it.
Case Study: Wedgewood Goes Toxic Free (page 254)	In this case study, students read about the work of a citizen’s action group that results in a by-law to prohibit the use of pesticides in a town.	<ul style="list-style-type: none"> No specific reading strategies are presented. Teachers could ask students to generate strategies that will help them identify five actions carried out by the citizen’s group. Expect strategies such as: <ul style="list-style-type: none"> – Read the question at the bottom first so we know what to look for. – Use underlining or highlighting to identify the required information. – Use numbers to identify each point. This Science and Literacy Link helps students develop skills for the page 262 Science and Literacy Link, Develop an Action Plan. At the end of the chapter, you may wish students to discuss the case study on BLM 12–3 Case Study: Two Islands. This worksheet is available on your teacher CD.

Science and Literacy Link	Synopsis	Literacy Connection
Case Study: Stop Smoking (page 261)	Students read several paragraphs about an anti-smoking campaign and view a related poster.	<ul style="list-style-type: none"> • Students use highlighting to identify information needed to write a paragraph explaining how students organized to address smoking. • When viewing the poster in this Case Study, you may wish to discuss the following questions with students: <ul style="list-style-type: none"> – What is the message? – Who is the audience? What clues does the format of the ad give about the audience (e.g., simple vocabulary, visuals of everyday life)? – What formats does the ad use to attract attention? • This Science and Literacy Link helps students develop skills for the page 262 Science and Literacy Link, Develop an Action Plan.
Develop an Action Plan (page 262)	Working in groups, students conduct research on school composting, and then develop an action plan.	<ul style="list-style-type: none"> • Students conduct research on three questions. They discuss several questions. • They then complete a chart which serves as the action plan.
Advertising Claims (page 282)	Students study the label of a yogurt container and assess the accuracy of the advertising claim.	<ul style="list-style-type: none"> • Many ads distort the meaning of English words; for example, this yogurt is advertised as “Fat Free”. In fact, there are 0.4 g of fat per serving; however, government regulations allow advertisers to use the term “Fat Free” for any foods that contain no more than 0.5 grams of fat per serving. • Students discover that advertising claims can blur distinctions between seemingly clear and simple terms.
Out With the Bad Cholesterol, In With the Good (page 285)	Students learn about LDL and HDL forms of cholesterol.	<ul style="list-style-type: none"> • Students use underlining to identify the difference between good and bad cholesterol. • They answer two basic comprehension questions and then answer a Making Connections question that prompts them to write an advertising claim about trans fats.
Find the Hidden Sugar (page 287)	This reading selection reports on how much sugar Canadians consume in an average day. It also teaches students 15 different terms that are used in labels to express sugar content.	<ul style="list-style-type: none"> • Students use highlighting and circling to focus on how to estimate the amount of sugar. • Students estimate the amount of sugar in three common foods.

Science and Literacy Link	Synopsis	Literacy Connection
Is Sugar Healthy or Harmful? (page 289)	This reading passage sets the context for understanding the health risks of too much sugar in our diet.	<ul style="list-style-type: none"> • This passage provides some background information students can use to assess the artificial sweetener aspartame. • Students research the use of aspartame and state an opinion on the use of this artificial sweetener. • The Technology Links related to this research activity are provided in this teacher’s resource. • Master 2 Writing an Opinion Paragraph will assist students with the opinion paragraph requested in question 2 c). This worksheet is available on your teacher CD.
Advertising Techniques (page 296)	Students read about and see examples of five different advertising techniques.	<ul style="list-style-type: none"> • Students are asked to read a sample ad and underline the advertising claim. • They then identify who is talking in the ad and what claim is being made — and assess what type of claim it is. • Students describe an ad they are familiar with and identify the unfinished claim. • Asking students to draw on prior knowledge helps them link what they are reading to their own lives.
Coming Clean About Detergents (page 301)	Students research three harmful chemicals in laundry detergent and a recipe for homemade detergent that is safer.	<ul style="list-style-type: none"> • Students use a chart to summarize information about three chemicals used in laundry detergent. • They write out a recipe. • Students use an example to describe an unfinished advertising claim. They then write an example of each type of advertising claim. • Producing an example is an excellent method of illustrating that you understand what you are reading.
Information and Bias (page 305)	Students read a definition of bias and begin to consider what types of information they read might have bias.	<ul style="list-style-type: none"> • Students answer two basic comprehension questions and then assess the possible bias of three different sources of information on the web.
Write a Report (page 310)	Students research the events leading to the Walkerton water contamination in 2000.	<ul style="list-style-type: none"> • Students list key events leading up to the Walkerton water contamination and identify the steps that have been taken to prevent similar tragedies.

Science and Literacy Links are not the only places where students develop literacy skills. This icon is used as a symbol to highlight explicitly to students that they should focus on these skills. Throughout the student resource, however, there are many other features that you, the teacher, can use to promote the development of students’ literacy skills. These include embedded vocabulary building, reading strategies, graphic organizers, job lists, and cartoons.

The older the student, the more challenging it is to develop appealing content at an appropriate reading level. Since mature students also have a greater need to discuss and challenge ideas, *Science Essentials 10* pays a great deal of

attention to having students state a point of view. Cartoons and PMI charts have been added to promote discussion and critical thinking related to concepts and decision making.

Science and Media Links

Science and Media is an important unit in SNC2L that is new to both students and teachers. How to Think Like a Scientist introduces students to science and the media; Unit D focuses on this topic. In addition, Science and Media Links throughout the student resource slowly build the knowledge and skill that will promote student understanding of science and the media.

Science and Media Link	Synopsis	Literacy Connection
Analyzing Energy Drinks (page 12)	This media link provides background information on energy drinks.	<ul style="list-style-type: none"> • Students use underlining and circling to focus on effects of specific ingredients and effects of energy drinks in general. • Students answer five multiple choice comprehension questions. • Students write a few sentences to distinguish between energy and sports drinks. • This reading prepares students for Find Out: Evaluating Energy Drinks.
Information Please! (page 18)	Students read the labels of four consumer products. For the first two labels, students focus on the features of labels, such as headings and warnings. For the second two, students focus on the ingredients lists.	<ul style="list-style-type: none"> • Consumer labels are an important media tool that many people overlook. This link begins the process for students to understand the purpose of labels, the information they contain, and the skills required for critical analysis. • Students answer questions for each pair of labels.
Where's the Dry in Dry Cleaning? (page 77)	Students read about the science of dry cleaning and then apply their learning of the different kinds of support used in making choices.	<ul style="list-style-type: none"> • Students use underlining, highlighting, and circling as ways to distinguish among the different kinds of support. • They use the information to express their opinion and write point-form notes to support their view.
Plastics, Health, and the Environment (page 84)	This is a four-page media link that presents three different forms of information: an interview, a memo, and a web page.	<ul style="list-style-type: none"> • Students use highlighting and circling as ways to distinguish benefits from concerns. • Students answer factual questions. • Students scan the materials looking for different kinds of support. • They use the information to express their opinion and write point-form notes to support their view. They also conjecture an alternative point of view and the reasons someone might have for that view.

Science and Media Link	Synopsis	Literacy Connection
		<ul style="list-style-type: none"> You might use OHT 2 Writing an Opinion Paragraph to help students plan their paragraphs. This overhead is repeated on Master 2 Writing an Opinion Paragraph, which can be used throughout this student resource when students are asked to express an opinion. This activity builds on the previous Media Link. It also builds prior knowledge required for successful completion of Find Out: Are Plastics Positive or Negative?
What to Do? (page 100)	A cartoon with three frames illustrates the frustration of blackouts.	<ul style="list-style-type: none"> Some students need explicit instructions on reading cartoons. Have students number each frame in the order in which it should be viewed/read. The related Making Connections questions prompt students to think about how a blackout affects different segments of our communities.
Are Cheap Batteries Worth Buying? (page 132)	Students read text, a bar graph, and a table to learn about different kinds of batteries.	<ul style="list-style-type: none"> Discuss with students the kind of information presented in this Science and Media Link. Time may be well spent on reading the bar chart and information chart as a class. Students answer basic comprehension questions and make connections by designing a checklist to help them shop for batteries.
Our Energy, Our Future (page 154)	This two-page Science and Media Link is presented as a blog in which seven students have posted their views on different kinds of energy.	<ul style="list-style-type: none"> The views expressed by students serve the purpose of showing students that there is a diversity of views on energy. Students highlight points that will help them form an opinion. They are asked to express their own opinion and write point-form notes supporting their opinion. Students then write a paragraph using supplied stem sentences as support.
What are the Options? (page 161)	Students compare two EnerGuide labels.	<ul style="list-style-type: none"> This activity builds prior knowledge required to understand the purpose of the Science and Math Link on page 162. Specific strategies for reading these labels are not provided. Consider reviewing the general purpose of a consumer label, and the specific kinds of information found on these labels. Students answer three comprehension questions.

Science and Media Link	Synopsis	Literacy Connection
Where Are the Batteries Going? (page 179)	Students learn that button batteries are toxic.	<ul style="list-style-type: none"> Students read the label on a battery and answer questions about the clarity of the label. Students write their own opinion with point-form notes to support their view. You may wish to have students use Master 2 Writing an Opinion Paragraph to answer question 3. b).
Are Cats Out of Control? (page 182)	This two-page reading is in the form of a newspaper article and focuses on introduced species.	<ul style="list-style-type: none"> No specific reading strategies are provided. This is an opportunity to ask students how they should approach the reading. It would be helpful if students read the questions in advance, and then decided how (highlighting, circling, underlining) to identify information in the text for specific questions. In question 4, students are asked to research three more introduced species.
Draining a Wetland to Build a Mall (page 202)	This two-page reading is written in the form of a radio show interview. It focuses on the different points of view regarding a proposal to build a mall in a nearby wetland.	<ul style="list-style-type: none"> The radio show appears as a series of six cartoon frames. Students use the information provided to express their opinion and write point-form notes to support their view. They also conjecture an alternative point of view and the reasons someone might hold that view. You may wish to have students use Master 2 Writing an Opinion Paragraph to answer question 3. c).
A Wolf's Last Call (page 250)	Written in the form of a blog, this is an appeal to humans regarding the alarming decrease in the wolf population.	<ul style="list-style-type: none"> Students read text and a line graph within the blog. Students may need reminders to read the questions first and decide on a strategy for identifying information in the text. Students have to identify kinds of evidence used by the wolf as support.
Analyzing an Endangered Species Ad (page 256)	Students study a mock ad on endangered species.	<ul style="list-style-type: none"> Students answer questions related to the purpose and audience for this ad.
Should We Burn It or Bury It? (page 273)	Students read about waste disposal in the form of a newspaper article.	<ul style="list-style-type: none"> Students answer two multiple choice questions and then write their opinion and point-form notes supporting their opinion. You may wish to have students use Master 2 Writing an Opinion Paragraph to answer question 3.

Science and Media Link	Synopsis	Literacy Connection
Blowing Smoke at Teens (page 276)	Students read two paragraphs outlining facts related to smoking rates among teenagers.	<ul style="list-style-type: none"> Students answer some multiple choice questions and use prior knowledge to reflect on how tobacco companies target teenagers in their media campaigns. Students assess whether or not they are immune to advertisers.
Finding Reliable Information (page 314)	This is the Unit D Task for which all of the previous media links have been written.	<ul style="list-style-type: none"> This task is comprised of ten questions that require research to complete. The eleventh question directs students to prepare a presentation that informs grade 7 students about the risks of smoking.

Graphic Organizers

Graphic organizers provide many benefits, including:

- helping students to make connections,
- supporting weak readers, and
- helping students to organize information in a way that they can easily use later.

Like the *Science Essentials 9* Student Resource, the *Science Essentials 10* Student Resource makes use of several types of organizers, including charts, tables, mind maps, a Venn diagram, and double bubble organizers.




Checklists are a useful form of organizer that helps students check and keep track of information and steps in directions.

Graphic Organizers	Literacy Connection
Cartoons (pages 6, 11, 75, 76, 84, 100, 131, 269, 270, 299)	<ul style="list-style-type: none"> In the cartoons, different characters make their thinking visible or raise questions related to a scientific inquiry or new science concept. The cartoon demonstrates the range of thinking that might exist. Students may agree with one character's thinking or begin to wonder which idea is correct. In either case, the cartoon provides a forum for students to explore ideas and present arguments for and against ideas. Used in the context of small groups, or the whole class, concept cartoons have the potential to stimulate discussion and motivate those reluctant to share their own ideas. Consider asking students to develop their own concept cartoons.
Checklists (Categorize information: page 7 Check procedural steps: pages 33, 46, 59, 63, 66–68, 94, 142–143, 148, 164, 190, 194, 201, 204–205, 220, 226–227, 237, 309 Complete a task: pages 268–271 Design a checklist: page 133 Identify concepts covered: page 76 Plan a presentation: page 257)	<ul style="list-style-type: none"> Many checklists throughout the student resource help students to keep track of procedural steps that they have completed. Checklists can also be used to categorize information, identify what concepts have been covered, and plan a presentation. Designing a checklist is a good way for students to organize their knowledge and decide how to apply it.

Graphic Organizers	Literacy Connection
<p>Venn Diagram and Double Bubble Organizers (pages 15, 36, 69, 313)</p>	<ul style="list-style-type: none"> Identifying similarities and differences is a very effective learning strategy. Besides the instances that are used explicitly in the student resource, teachers might consider using this strategy to help students better discern similarities and differences among closely related pairs of words or concepts, such as physical change—chemical change, omnivore—carnivore, food chain—food web, organic fertilizer—commercial fertilizer. Some students have difficulty using Venn diagrams. You may wish to have students start with a three-column table, put the similarities in the centre column, and the differences in the outside columns, then transfer this information to the Venn diagram.
<p>Brainstorms, Mind Maps, and Post Mind Maps (Brainstorms: page 178 Mind Maps: pages 16, 98, 180, 274 Post Mind Maps: pages 17, 99, 181)</p>	<ul style="list-style-type: none"> Mind maps assist students in brainstorming what they know about a topic. This accessing of prior knowledge facilitates new learning. Mind maps also support weak writers to develop and think about content, leading to greater quantity and quality of writing, and promote greater reflection and retention of learning. The beginning of each unit includes a post mind map. This mind map is completed at the end of the unit. Students compare their original mind map to the second one, assess what they have learned, and visually see the growth in their learning.
<p>PMI Charts (pages 15, 79, 88, 91, 96–97, 151, 153, 214)</p>	<ul style="list-style-type: none"> PMI stands for Plus, Minus, and Interesting. This method allows students to capture, in chart form, advantages and disadvantages (or risks and benefits) of the decision-making process. The Interesting column is used to capture information that is not immediately an advantage or a disadvantage, but that could be recorded and considered in some way.

Other Literacy Features

The other literacy elements in the *Science Essentials 10* Student Resource include

-  reading icons;
-  **Check Your Understanding** Check Your Understanding questions; and
-  **Making Connections** Making Connections questions.

Each of these features follow the same purpose as in *Science Essentials 9*.

The chart below shows the different cue words used in the reading icons, and the importance of each cue word.

Cue Words	Examples	Importance to Literacy Development
As you read...	page 4 1. As you read the following, highlight the three types of variables. page 21 4. As you read the following text, circle three kinds of chemical names.	<ul style="list-style-type: none"> • This is a pre-reading strategy. It explains to students the purpose of reading. The suggestion that follows is always a during-reading strategy that provides students with a tool for monitoring their own understanding as they read.
...underline... ...highlight... ...circle... ...check... Put an X...	page 11 1. As you read the following, underline the part that describes a media literate person. page 18 1. Highlight the headings on each product below. page 232 2. Circle the term for non living factors. page 171 1. As you read the list of energy-saving tips, check the things that your household already does. Put an X beside the items that do not apply to you.	<ul style="list-style-type: none"> • Highlighting, underlining, and circling are good during-reading strategies that ask students to mark up the student resource as they find specific information. Marking up the text requires that students evaluate what they read as they read and decide whether it meets the necessary criteria. • Checking what students have marked provides you, the teacher, with a simple visual method of assessing learning. • Students can be asked to work individually and then check their work with a partner. This provides an assessment strategy that puts the learning in the hands of the student. • Reading visuals is as important as reading text. Many media pieces have a lot of information in the visuals.
...decide...	page 36 1. As you read, decide why higher temperatures are usually required to set combustible substances on fire than to set flammable substances on fire.	<ul style="list-style-type: none"> • These cue words indicate a requirement for the student to make a decision based on information contained in the text and may be used as a means of assessing comprehension.

Cue Words	Examples	Importance to Literacy Development
<p>As you read, highlight...</p> <p>In your own words...</p>	<p>page 169 8. As you read, highlight the least expensive time to use electric energy.</p> <p>page 196 1. In your own words, what does limit mean?</p>	
<p>Before you read...</p>	<p>page 71 Before you read this page, check off whether you agree or disagree with each statement. After you read, return to the table and complete the After You Read section.</p> <p>page 260 1. Before you read the material below, write two things you know about the effect of pollution on the environment.</p>	<ul style="list-style-type: none"> Before-reading strategies such as these ask students to access their prior knowledge. Relevant thinking time before reading prepares students to better make connections and comprehend what they will read.
<p>What is the one thing...</p> <p>...underline the words that tell you the difference...</p>	<p>page 42 1. b) What is the one thing that is the same after any physical change occurs?</p> <p>page 285 1. As you read, underline the words that tell you the difference between bad cholesterol and good cholesterol.</p>	<ul style="list-style-type: none"> This during-reading strategy asks students to differentiate between key ideas within a selected passage and may be used to assess comprehension.
<p>...underline two connections...</p> <p>Circle...</p> <p>List...</p>	<p>page 64 1. As you read, underline two connections between concentration and rate of rotting.</p> <p>page 158 1. Circle five ways that this household is using energy. 2. List five ways the household could save electric energy.</p>	<ul style="list-style-type: none"> This during-reading strategy asks students to read the passage with a focus on making connections between related ideas.

Cue Words	Examples	Importance to Literacy Development
After you read...	<p>page 196</p> <p>2. a) After you read the table below, highlight each example of an abiotic factor.</p> <p>b) Circle each example of a biotic factor.</p> <p>page 216</p> <p>1. After you read the next paragraph, explain what social structure means.</p>	<ul style="list-style-type: none"> • After-reading strategies assist students in checking what they have read. This can increase comprehension.
Scan the text...	<p>page 84</p> <p>1. Scan the text in the interview, memo, and web page on the next three pages.</p> <ul style="list-style-type: none"> • Highlight each benefit of using plastic. • Circle each concern about using plastic. 	<ul style="list-style-type: none"> • These cue words indicate an opportunity for students to use their scanning skills in a selected passage.
<p>As you read... write</p> <p>After you read...</p> <p>As you read..., highlight...</p> <p>As you read..., list...</p>	<p>page 110</p> <p>1. A CD player converts electric energy into another form of energy. As you read the following, write down the form of this energy.</p> <p>page 128</p> <p>1. After you read this page:</p> <p>a) Write “high voltage” under the flashlight that uses the most voltage.</p> <p>b) Write “high current” under the flashlight that uses the greatest current.</p> <p>page 134</p> <p>1. As you read the following, highlight four disadvantages of batteries.</p> <p>page 147</p> <p>2. As you read this page, list two types of non-renewable energy.</p>	<ul style="list-style-type: none"> • These cue words indicate that the students will have to fill in blanks, make connections, make inferences, or write factual information after reading very short sections.

Cue Words	Examples	Importance to Literacy Development
<p>Circle...</p> <p>...trace...</p>	<p>page 113</p> <p>2. Circle the power rating on the light bulb shown here.</p> <p>page 140</p> <p>1. Circle two sources of electric energy in the cartoon.</p> <p>page 206</p> <p>1. a) After you read this page, trace the part of the graph that shows what happens when the fruit fly population gets overcrowded.</p> <p>b) Describe what happens.</p>	<ul style="list-style-type: none"> Photographs, images, and diagrams help students to make a visual connection to the text. This strategy asks students to direct their attention to the visuals in a particular way and offers a way to record comprehension during the reading.
<p>Reading tables</p> <p>Reading charts</p>	<p>page 162</p> <p>1. Highlight the lowest EnerGuide rating for each type of appliance.</p> <p>page 222</p> <p>1. Highlight the titles on the chart that identify benefits of living together.</p> <p>page 284</p> <p>1. Read the chart. Highlight the health effects of each fat.</p> <p>page 307</p> <p>3. There are three numbers on the fertilizer label. In the chart below, write the correct number from the Multi-Gro Plant Fertilizer label on page 306 beside the correct macronutrient.</p>	<ul style="list-style-type: none"> Tables and charts organize information logically according to the titles recorded in the header. The information in tables and charts is often denser than simple prose. As a result, specific during-reading instructions for tables and charts are as important as specific reading instructions for pictures and other graphic elements. The completion of additional rows or columns in a table or chart is an after reading strategy that provides students with an opportunity to demonstrate their understanding of both the titles in the header row and the content of the table.
<p>Read the following ads...</p> <p>Read the food label...</p>	<p>page 278</p> <p>1. Read the following ads and underline the advertising claims made.</p> <p>page 286</p> <p>1. Read the food label. Circle the amount of sugar in one cup of unsweetened grape juice.</p>	<ul style="list-style-type: none"> Reading consumer items is a skill in itself that students need to learn to protect themselves in the marketplace.

Cue Words	Examples	Importance to Literacy Development
...highlight points that will help you form your opinion.	<p>page 154</p> <p>1. You are going to give your opinion on which method of generating electric energy is the best. First, read the blog and comments. As you read, highlight points that will help you form your opinion.</p>	<ul style="list-style-type: none"> These cue words indicate a higher-level strategy that combines comprehension and synthesis skills as it asks students to read the passage for the purpose of collecting points to support their opinion.
<p>...highlight the definitions for...</p> <p>...write the key word...</p> <p>...highlight the definition of...</p> <p>...underline the meaning...</p>	<p>page 170</p> <p>As you read, highlight the definitions for</p> <p>a) energy conservation</p> <p>b) energy efficiency</p> <p>page 185</p> <p>3. After reading the following paragraph, write the key word that best describes each picture.</p> <p>page 214</p> <p>1. As you read the following, highlight the definition of a community.</p> <p>page 232</p> <p>1. In the following paragraph, highlight the definition of ecosystem.</p> <p>Page 253</p> <p>As you read, underline the meaning of pesticides.</p>	<ul style="list-style-type: none"> Learning the meaning of key words enhances understanding significantly, especially for students who find it difficult to learn the meaning of new words from context. This during-reading strategy focuses the students on the definition of key words.
Look at the pictures and answer the questions	<p>page 186</p> <p>1. After reading the following paragraph, look at the pictures and answer the questions. How many species of plants do you see? How many plants of each species are there?</p> <p>page 224</p> <p>The picture shows problems that people living in a city face.</p> <p>1. Circle four problems.</p> <p>2. Think of at least two more problems.</p>	<ul style="list-style-type: none"> This strategy requires students to look at visual cues and interpret their meaning. It may be used to assess comprehension of the focal issue.

For additional ideas on dealing with literacy in the science classroom, you may wish to read *Scientific Literacy for Canadian Students* (2005, Temeron Books, Inc., ISBN 1-55050-288-2).