Reference and Resources

General Blackline Masters (on accompanying CD)

Safety Masters

BLM G-1 Safety Contract
BLM G-2 WHMIS Symbols and Hazardous Household Product Symbols

Science Toolkit Masters

BLM G-3 Group Roles
BLM G-4 Making Observations and Inferences
BLM G-5 Science Inquiry Organizer
BLM G-6 Recording an Investigation
BLM G-7 Design Your Own Investigation
BLM G-8 Correlational Study Worksheet
BLM G-9 Experimental Design Worksheet
BLM G-10 Technological Problem-Solving Organizer
BLM G-11 Technology Innovation Worksheet
BLM G-12 Scientific Research Planner
BLM G-13 Research Worksheet
BLM G-14 Debating Procedures
BLM G-15 Debate Organizer
BLM G-16 Tips for Investigating Many-Sided Issues
BLM G-17 Worksheet for Investigating Issues
BLM G-18 Decision-Making Organizer
BLM G-19 Variables in Science
BLM G-20 Parts of a Microscope
BLM G-21 Using Ammeters and Voltmeters
BLM G-22 Reading an Analogue Meter
BLM G-23 Data Table
BLM G-24 Problem Solving Using GRASP

Math Toolkit Masters

BLM G-25 Constructing a Line Graph
BLM G-26 Interpreting Line Graphs
BLM G-27 Estimating
BLM G-28 Metric Conversions
BLM G-29 Using Scientific Notation
BLM G-30 K-W-L Chart

Study Toolkit Masters

BLM G-31 Summarizing
BLM G-32 English Word Study
BLM G-33 Cause and Effect Map
BLM G-34 Concept Map
BLM G-35 Flowchart
BLM G-36 Main Idea Web
BLM G-37 Spider Map
BLM G-38 T-chart
BLM G-39 Venn Diagram

Reference Masters (to support Student book activities)

BLM G-40 Activity 2-3, What Was for Dinner? Identification Key
BLM G-41 Build an H-R Diagram
BLM G-42 Star Maps for Fall, Winter, Spring

Connect to the Big Ideas Masters (Answers)

BLM G-43 Unit 1 Connect to the Big Ideas
BLM G-44 Unit 2 Connect to the Big Ideas
BLM G-45 Unit 3 Connect to the Big Ideas
BLM G-46 Unit 4 Connect to the Big Ideas

ON Science 9 to Science, Grade 9 Academic (SNC1D)

Curriculum Outcome	Reference
	Note: The curriculum outcomes are fundamental to the McGraw-Hill Ryerson Discovering Science program. Following are some points in the textbook where the curriculum outcomes are addressed. This is not an exhaustive list.
A. Scientific Investigation Skills and Career Exploration	
A1. Scientific Investigation Skills	
A1.1 formulate scientific questions about observed relationships, ideas, problems, and/or issues, make predictions, and/or formulate hypotheses to focus inquiries or research	Inquiry Investigation 2-B, What Happens When Food Is Limited?, pp. 80–81 Inquiry Investigation 6-A, What Causes Rusting of Iron Nails?, p. 249 Data Analysis Investigation 7-C, Gravity on Other Planets, p. 310 Plan Your Own Investigation 10-A, Comparing Conductivity, p. 429
A1.2 select appropriate instruments (e.g., sampling instruments, laboratory glassware, magnifying lenses, an electroscope) and materials (e.g., ebonite rods, star charts, a ball and spring apparatus, pH paper) for particular inquiries	Inquiry Investigation 1-C, Soil-water Acidity and Plant Growth, pp. 40–41 Plan Your Own Investigation 4-C, Properties of Common Substances, pp. 170–171 Plan Your Own Investigation 8-A, The Brightness of Stars, pp. 350–351 Plan Your Own Investigation 10-B, Be a Charge Detective, p. 430
A1.3 identify and locate print, electronic, and human sources that are relevant to research questions	Unit 1 Projects, An Issue to Analyze, Protecting Ecosystems, p. 127 Unit 2 Projects, An Issue to Analyze, The Impact of Metal Mining, p. 259 Inquiry Investigation 9-A, Estimating the Age of the Universe, pp. 382–383 Unit 4 Projects, An Issue to Analyze, A "Greener" Power Mix, p. 523
A1.4 apply knowledge and understanding of safe practices and procedures when planning investigations (e.g., appropriate techniques for handling, storing, and disposing of laboratory materials [following the Workplace Hazardous Materials Information System–WHMIS]; safe operation of electrical equipment; safe handling of biological materials), with the aid of appropriate support materials (e.g., the Reference Manual on the WHMIS website; the Live Safe! Work Smart! website)	Inquiry Investigation 1-C, Soil-water Acidity and Plant Growth, pp. 40–41 Activity 4-2, Safety First!, p. 141 Inquiry Investigation 4-B, Chemical Properties of Common Gases, pp. 168–169 Plan Your Own Investigation 8-A, The Brightness of Stars, pp. 350–351 Activity 11-4, Measuring Current and Potential Difference in a Series Circuit, p. 459
A1.5 conduct inquiries, controlling some variables, adapting or extending procedures as required, and using standard equipment and materials safely, accurately, and effectively, to collect observations and data	Inquiry Investigation 1-B, The Chemistry of Photosynthesis, pp. 38–39 Section 4.3, Activity 4-7, What's New?, p. 162 Inquiry Investigation 7-B, The Changing View of the Night Sky, pp. 308–309 Inquiry Investigation 11-A, Constructing and Comparing Voltaic Cells, pp. 472–473

A1.6 gather data from laboratory and other sources, and organize and record the data using appropriate formats, including tables, flow charts, graphs, and/or diagrams	TR Reference Inquiry Investigation 3-B, Balancing Populations and the Environment, pp. 118–119 Inquiry Investigation 6-B, Properties of Ionic and Covalent Compounds, pp. 250–251 Inquiry Investigation 7-B, The Changing View of the Night Sky, pp. 308–309 Inquiry Investigation 11-D, Testing Ohm's Law, p. 478
A1.7 select, organize, and record relevant information on research topics from various sources, including electronic, print, and/or human sources (e.g., Statistics Canada publications, NASA or EnerGuide websites, personal interviews), using recommended formats and an accepted form of academic documentation	Unit 1 Projects, An Issue to Analyze, Protecting Ecosystems, p. 127 Unit 2 Projects, An Issue to Analyze, The Impact of Metal Mining, p. 259 Unit 3 Projects, An Issue to Analyze, Canadian Space Missions: To Go or Not to Go?, p. 391
A1.8 analyse and interpret qualitative and/or quantitative data to determine whether the evidence supports or refutes the initial prediction or hypothesis, identifying possible sources of error, bias, or uncertainty	Data Analysis Investigation 2-A, Is the Winter Skate Endangered in Nova Scotia?, p 79 Plan Your Own Investigation 4-D, CFC Production and Canada's Ozone Layer, p 172 Inquiry Investigation 9-B, Modelling the Expanding Universe, pp. 384 Inquiry Investigation 11-C, Loads in Parallel, pp. 476–477
A1.9 analyse the information gathered from research sources for reliability and bias	Real World Investigation 3-A, Zebra Mussels in Lake Ontario, p. 117 Section 5.3, Case Study, Diamond Mining: Beyond the Sparkle, pp. 202–203 Section 9.2, Case Study, Space Exploration Spin-Offs, pp. 370–371 Section 10.3, Case Study, E-waste, pp. 422–423
A1.10 draw conclusions based on inquiry results and research findings, and justify their conclusions	Plan Your Own Investigation 1-A, Fertilizers and Algae Growth, p. 37 Inquiry Investigation, Reactivity Trends in the Periodic Table, p. 214 Inquiry Investigation 8-B, Using Spectral Analysis to Identify Star Composition, pp. 352–353 Inquiry Investigation 11-B, Loads in Series, pp. 474–475
A1.11 communicate ideas, plans, procedures, results, and conclusions orally, in writing, and/or in electronic presentations, using appropriate language and a variety of formats (e.g., data tables, laboratory reports, presentations, debates, simulations, models)	Unit 1 Projects, Inquiry Project, Pollutants and Aquatic Ecosystems, p. 126 Unit 2 Projects, Inquiry Investigation, Rust Prevention, p. 258 Unit 3 Projects, Inquiry Investigation, Simulating a Cosmic Event. p. 390 Unit 4 Projects, Inquiry Investigation, Designing an Electrical Makeover, p. 522
A1.12 use appropriate numeric, symbolic, and graphic modes of representation, and appropriate units of measurement (e.g., SI and imperial units)	Activity 1-3, Recycling in Ontario, p. 32 Activity 5-3, Atomic Model Time Line, p. 185 Activity 9-3, Counting Galaxies by Sampling, p. 366 Section 12.2, Using Electricity Wisely, pp. 492–500
A1.13 express the results of any calculations involving data accurately and precisely	Plan Your Own Investigation 1-D, Can a Plant Have Too Much Fertilizer?, p. 42 Inquiry Investigation 6-B, Properties of Ionic and Covalent Compounds, pp. 250–251 Inquiry Investigation 9-A, Estimating the Age of the Universe, pp. 382-383 Inquiry Investigation 11-D, Testing Ohm's Law, p. 478

A2. Career Exploration	
A2.1 identify and describe a variety of careers related to the fields of science under study (e.g., astrophysicist, geophysicist, conservation officer, park warden, fire protection engineer, hydrologist, electrician) and the education and training necessary for these careers	Chapter 3, Science at Work, pp. 124–125 Chapter 6, Science at Work, pp. 256–257 Chapter 9, Science at Work, pp. 388–389 Chapter 12, Science at Work, pp. 520–521
A2.2 identify scientists, including Canadians (e.g., David Suzuki, Howard Alper, Roberta Bondar, Kenneth Hill), who have made a contribution to the fields of science under study	Chapter 3, Science at Work, pp. 124–125 Chapter 6, Science at Work, pp. 256–257 Chapter 9, Science at Work, pp. 388–389 Chapter 12, Science at Work, pp. 520–521
B. Biology: Sustainable Ecosystems	
B1. Relating Science to Technology, Society, and the Environment	
B1.1 assess, on the basis of research, the impact of a factor related to human activity (e.g., urban sprawl, introduction of invasive species, overhunting/overfishing) that threatens the sustainability of a terrestrial or aquatic ecosystem [IP, PR, AI, C]	Data Analysis Investigation 2-A, Is the Winter Skate Endangered in Nova Scotia?, p. 79 Inquiry Investigation 2-B, What Happens When Food Is Limited?, pp. 80–81 Section 3.3, Case Study, Saving Dolly Varden, pp. 106–107 Activity 3-5, The Common Good, p. 113
B1.2 evaluate the effectiveness of government initiatives in Canada (federal, provincial, municipal), and/or the efforts of societal groups or non-governmental organizations, such as Aboriginal communities, environmental groups, or student organizations, with respect to an environmental issue that affects the sustainability of terrestrial or aquatic ecosystems [AI, C]	Activity 1-3, Recycling in Ontario, p. 32 Section 3.4, Restoration Ecology. pp. 110–116 Unit 1 Projects, An Issue to Analyze, Protecting Ecosystems, p. 127
B2. Developing Skills of Investigation and Communication	
B2.1 use appropriate terminology related to sustainable ecosystems, including, but not limited to: *bioaccumulation, biosphere, diversity, ecosystem, equilibrium, sustainability, sustainable use, protection,* and *watershed* [C]	Unit 1, Sustainable Ecosystems, pp. 7–131
B2.2 interpret qualitative and quantitative data from undisturbed and disturbed ecosystems (terrestrial and/or aquatic), communicate the results graphically, and, extrapolating from the data, explain the importance of biodiversity for all sustainable ecosystems [PR, AI, C]	Section 1.1, Case Study, The Disappearing Eel, pp. 8–9 Plan Your Own Investigation 1-A, Fertilizers and Algae Growth, p. 37 Real World Investigation 3-A, Zebra Mussels in Lake Ontario, p. 117
B2.3 plan and conduct an investigation, involving both inquiry and research, into how a human activity affects soil composition or soil fertility, and, extrapolating from the data and information gathered, explain the impact of this activity on the sustainability of terrestrial ecosystems [IP, PR, AI, C]	Inquiry Investigation 1-C, Soil-water Acidity and Plant Growth, pp. 40–41 Plan Your Own Investigation 1-D, Can a Plant Have Too Much Fertilizer?, p. 42
B2.4 plan and conduct an investigation, involving both inquiry and research, into how a human activity affects water quality (e.g., leaching of organic or inorganic fertilizers or pesticides into water systems, changes to watersheds resulting from deforestation or land development, diversion of ground water for industrial uses), and, extrapolating from the data and information gathered, explain the impact of this activity on the sustainability of aquatic ecosystems [IP, PR, AI, C]	Plan Your Own Investigation 1-A, Fertilizers and Algae Growth, p. 37 Inquiry Investigation 1-B, The Chemistry of Photosynthesis, pp. 38-39

B2.5 analyse the effect of human activity on the populations of terrestrial and aquatic ecosystems by interpreting data and generating graphs (e.g., data from Statistics Canada, Parks Canada, and other websites on: the concentration in water of chemicals from fertilizer run-off and their effect on the growth of algae; stressors associated with human use of natural areas, such as trampled vegetation, wildlife mortality from motor vehicles, and the removal of plants, animals, and/or natural objects; suburban developments and their impact on the food supply for animals such as foxes and raccoons) [PR, AI, C]	Section 2.4, Case Study, Why Are Honeybees Disappearing?, pp. 72–73 Data Analysis Investigation 2-A, Is the Winter Skate Endangered in Nova Scotia?, p. 79 Real World Investigation 3-A, Zebra Mussels in Lake Ontario, p. 117
B3. Understanding Basic Concepts	
B3.1 compare and contrast biotic and abiotic characteristics of sustainable and unsustainable terrestrial and aquatic ecosystems	Section 1.1, Sustainability, pp. 7–20 Unit 1 Projects, Enquiry Project, Pollutants and Aquatic Ecosystems, p. 126
B3.2 describe the complementary processes of cellular respiration and photosynthesis with respect to the flow of energy and the cycling of matter within ecosystems (i.e., carbon dioxide is a by-product of cellular respiration and is used for photosynthesis, which produces oxygen needed for cellular respiration), and explain how human activities can disrupt the balance achieved by these processes (e.g., automobile use increases the amount of carbon dioxide in the atmosphere; planting more trees decreases the amount of carbon dioxide in the atmosphere)	Section 1.2, The Biosphere and Energy, pp. 21–27 Inquiry Investigation 1-B, The Chemistry of Photosynthesis, pp. 38–39
B3.3 describe the limiting factors of ecosystems (e.g., nutrients, space, water, energy, predators), and explain how these factors affect the carrying capacity of an ecosystem (e.g., the effect of an increase in the moose population on the wolf population in the same ecosystem)	Chapter 2, Populations and Sustainable Ecosystems, pp. 46-85 Section 3.3, Threats to Biodiversity, pp. 100–109 Inquiry Investigation 3-B, Balancing Populations and the Ecosystem, pp. 118–119
B3.4 identify the earth's four spheres (biosphere, hydrosphere, lithosphere, atmosphere), and describe the relationship that must exist between these spheres if diversity and sustainability are to be maintained	Section 1.1, Sustainability, pp. 7–20
B3.5 identify various factors related to human activity that have an impact on ecosystems (e.g., the introduction of invasive species; shoreline development; industrial emissions that result in acid rain), and explain how these factors affect the equilibrium and survival of ecosystems (e.g., invasive species push out native species and upset the equilibrium in an ecosystem; shoreline development affects the types of terrestrial and aquatic life that can live near lake shores or river banks; acid rain changes the pH of water, which affects the type of aquatic life that can survive in a lake)	Section 3.2, Communities, pp. 95-99 Section 3.3, Threats to Biodiversity, pp. 100-109 Section 3.4, Restoration Ecology, pp. 110–116
C. Chemistry: Atoms, Elements, and Compounds	
C1. Relating Science to Technology, Society, and the Environment	
C1.1 assess the usefulness of and/or the hazards associated with common elements or compounds in terms of their physical and chemical properties [AI, C]	Inquiry Investigation 4-A, Testing Physical Properties of Substances, pp. 166–167 Data Analysis Investigation 6-C Classification of Household Substances, p. 252

C1.2 assess social, environmental, and economic impacts of the use of common elements or compounds [AI, C]	Section 4.1, Case Study, What is the Cost of Our Products? pp. 146–147 Plan Your Own Investigation 4-D, CFC Production and Canada's Ozone Layer, p 172 Section 6.2, Case Study, Taking a Stand on Plastic Bags, pp. 238–239
C2. Developing Skills of Investigation and Communication	
C2.1 use appropriate terminology related to atoms, elements, and compounds, including, but not limited to: *boiling point, mixtures, particle theory, pure substances,* and *viscosity* [C]	Unit 2, Atoms, Elements, and Compounds, pp. 132–263
C2.2 conduct an inquiry to identify the physical and chemical properties of common elements and compounds (e.g., magnesium sulfate, water, carbon, copper II) [PR]	Inquiry Investigation 4-A, Testing Physical Properties of Substances, pp. 166–167 Inquiry Investigation 5-B, Physical Properties of Metals and Non-metals, p. 213
C2.3 plan and conduct an inquiry into the properties of common substances found in the laboratory or used in everyday life (e.g., starch, table salt, wax, toothpaste), and distinguish the substances by their physical and chemical properties (e.g., *physical properties:* hardness, conductivity, colour, melting point, solubility, density; *chemical properties:* combustibility, reaction with water) [IP, PR, AI]	Inquiry Investigation 4-A, Testing Physical Properties of Substances, pp. 166–167 Plan Your Own Investigation 4-C, Properties of Common Substances, pp. 170–171 Data Analysis Investigation 6-C Classification of Household Substances, p. 252
C2.4 conduct appropriate chemical tests to identify some common gases (e.g., oxygen, hydrogen, carbon dioxide) on the basis of their chemical properties, and record their observations [PR, C]	Inquiry Investigation 4-B, Chemical Properties of Common Gases, pp. 168–169
C2.5 construct molecular models to represent simple molecules (e.g., O_2, CO_2, H_2O, NH_3, CH_4) [PR]	Activity 6-5, Ball-and-Stick Models, p. 246
C3. Understanding Basic Concepts	
C3.1 explain how different atomic models evolved as a result of experimental evidence	Section 5.1, Evolution of the Atomic Model, pp. 179–186
C3.2 describe the characteristics of neutrons, protons, and electrons, including charge, location, and relative mass	Section 5.2, The Structure of the Atom, pp. 187–193
C3.3 distinguish between elements and compounds (e.g., compounds are pure substances that can be broken down into elements by chemical means)	Activity 4-3, Element, Compound, or Mixture?, p. 145 Plan Your Own Investigation 4-C, Properties of Common Substances, pp. 170–171
C3.4 describe the characteristic physical and chemical properties of common elements and compounds (e.g., aluminum is a good conductor of heat; copper reacts to moist air by developing a greenish surface of copper carbonate; sodium carbonate is a white, odourless powder that dissolves in water; water has unique physical properties that allow it to support life)	Inquiry Investigation 4-A, Testing Physical Properties of Substances, pp. 166–167 Inquiry Investigation 4-B, Chemical Properties of Common Gases, pp. 168–169 Plan Your Own Investigation 4-C, Properties of Common Substances, pp. 170–171 Data Analysis Investigation 6-C Classification of Household Substances, p. 252
C3.5 describe patterns in the arrangements of electrons in the first 20 elements of the periodic table, using the Bohr-Rutherford model	Inquiry Investigation 5-A, The Bohr-Rutherford Model of the Atom, p. 212
C3.6 explain the relationship between the atomic structure of an element and the position of that element in the periodic table	Section 5.3, The Periodic Table, pp. 194–206 Section 5.4, Trends in the Periodic Table, pp. 207–211

C3.7 compare and contrast the physical properties of elements within a group (e.g., alkali metals) and between groups (e.g., the carbon group and noble gases) in the periodic table	Section 5.3, The Periodic Table, pp. 194–206 Section 5.4, Trends in the Periodic Table, pp. 207–211
C3.8 identify and use the symbols for common elements (e.g., C, Cl, S, N) and the formulae for common compounds (e.g., H_2O, CO_2, NaCl, O_2)	Unit 2, Atoms, Elements, and Compounds, pp. 132–263
D. Earth and Space Science: The Study of the Universe	
D1. Relating Science to Technology, Society, and the Environment	
D1.1 assess, on the basis of research, and report on the contributions of Canadian governments, organizations, businesses, and/or individuals to space technology, research, and/or exploration (e.g., as part of the International Space Station mission; in the fields of telecommunications and satellite technology) [IP, PR, AI, C]	Section 8.1, Exploring Space, pp. 317–332 Unit 3 Projects, An Issue to Analyze, Canadian Space Missions: To Go or Not to Go?, p. 391
D1.2 assess some of the costs, hazards, and benefits of space exploration (e.g., the expense of developing new technologies, accidents resulting in loss of life, contributions to our knowledge of the universe), taking into account the benefits of technologies that were developed for the space program but that can be used to address environmental and other practical challenges on Earth (e.g., radiation monitors and barriers, sensors to monitor air and water quality, remote sensing technology, fire-resistant materials) [AI, C]	Section 8.1, Exploring Space, pp. 317–332 Unit 3 Projects, An Issue to Analyze, Canadian Space Missions: To Go or Not to Go?, p. 391
D2. Developing Skills of Investigation and Communication	
D2.1 use appropriate terminology related to the study of the universe, including, but not limited to: *celestial objects, orbital radius, retrograde motion,* and *satellite* [C]	Unit 3, The Study of the Universe, pp. 264–395
D2.2 use direct observation, computer simulation, or star charts to determine the location, appearance, and motion of well-known stars and other celestial objects that are visible in the night sky (e.g., the stars Polaris, Sirius, Betelgeuse; the planet Venus) [PR, AI]	Inquiry Investigation 7-B, The Changing View of the Night Sky, pp. 308–309
D2.3 plan and conduct a simulation that illustrates the interrelationships between various properties of celestial objects visible in the night sky (e.g., set up flashlights of various intensities at different distances from an observation point to help illustrate why the brightness of a star viewed from Earth is a function of both its actual brightness and its distance from Earth) [IP, PR, AI]	Inquiry Investigation 7-A, Modelling the Moon's Movement, p. 307 Activity 8-2, An Astronomer's View, p. 318 Plan Your Own Investigation 8-A, The Brightness of Stars, pp. 350–351
D2.4 gather and record data, using an inquiry or research process, on the properties of specific celestial objects within the solar system (e.g., the composition of their atmosphere, if any; the composition of their surface; the strength of their gravitational pull) [IP, PR, C]	Data Analysis Investigation 7-C, Gravity on Other Planets, p. 310 Inquiry Investigation 8-B, Using Spectral Analysis to Identify Star Composition, pp. 352–353 Data Analysis Investigation 8-C, Building an H-R Diagram, p. 354
D2.5 compare and contrast properties of celestial objects visible in the night sky, drawing on information gathered through research and using an appropriate format (e.g., compare the size of planets; represent the distance of stars from Earth using scientific notation; compare star temperatures and colour) [PR, AI, C]	Activity 7-3, Modelling the Solar System, p. 293 Section 7.4, Meet Your Solar System, pp. 291–296 Section 7.5, Other Objects in the Solar System, pp. 297–306 Section 8.3, Exploring Other Stars, pp. 341–349

D3. Understanding Basic Concepts	
D3.1 describe observational and theoretical evidence relating to the origin and evolution of the universe (e.g., evidence supporting the big bang theory)	Section 9.2, The Universe, pp. 368–376 Inquiry Investigation 9-A, Estimating the Age of the Universe, pp. 382–383
D3.2 describe observational and theoretical evidence relating to the formation of the solar system	Section 8.2, Exploring the Sun, pp. 333–340 Section 9.2, The Universe, pp. 368–376
D3.3 describe the major components of the solar system and the universe (e.g., planets, stars, galaxies), using appropriate scientific terminology and units (e.g., astronomical units, scientific notation, light years)	Section 7.4, Meet Your Solar System, pp. 291–296 Section 7.5, Other Objects in the Solar System, pp. 297–306 Section 8.3, Exploring Other Stars, pp. 341–349 Section 9.1, Galaxies, pp. 361–367
D3.4 describe the sun's composition and energy source, and explain how its energy warms Earth and supports life on the planet	Section 8.2, Exploring the Sun, pp. 333–340
D3.5 explain the causes of astronomical phenomena and how various phenomena can best be observed from Earth	Section 7.3, Movements of Earth and the Moon, pp. 283–290 Section 7.5, Other Objects in the Solar System, pp. 297–306 Section 8.2, Exploring the Sun, pp. 333–340
D3.6 describe various reasons that humankind has had for studying space and the conceptions of the universe held by various cultures and civilizations	Section 7.1, Ancient Astronomy, pp. 271–276
E. Physics: The Characteristics of Electricity	
E1. Relating Science to Technology, Society, and the Environment	
E1.1 analyse the design of a technological device that improves its electrical efficiency or protects other devices by using or controlling static electricity [AI, C]	Section 10.3 Charges at Work, pp. 418–428
E1.2 assess some of the social, economic, and environmental implications of the production of electrical energy in Canada from renewable and non-renewable sources [AI, C]	Section 12.3, Meeting the Demand for Electricity, pp. 501–505 Section 12.4, Sustainable Sources of Energy, pp. 506–507 Section 12.4, Case Study: Off the Grid and Living Green, pp. 508–509
E1.3 produce a plan of action to reduce electrical energy consumption at home, and outline the roles and responsibilities of various groups [IP, AI, C]	Real World Investigation 12-B, An Electrical Energy Audit, p. 514 Plan Your Own Investigation 12-D, Every Kilowatt Counts, p. 516
E2. Developing Skills of Investigation and Communication	
E2.1 use appropriate terminology related to electricity, including, but not limited to: *ammeter, amperes, battery, current, fuse, kilowatt hours, load, ohms, potential difference, resistance, switch, voltmeter,* and *volts* [C]	Unit 4, The Characteristics of Electricity, pp. 396–527
E2.2 conduct investigations into the transfer of static electric charges by friction, contact, and induction, and produce labelled diagrams to explain the results [PR, AI, C]	Activity 10-2, Detecting Static Charge Using and Electroscope, p. 412 Activity 10-3, Drawing Charges You Cannot See, p. 416 Plan Your Own Investigation 10-B, Be a Charge Detective, p. 430
E2.3 predict the ability of different materials to hold or transfer electric charges (i.e., to act as insulators or conductors), and test their predictions through inquiry [IP, PR]	Plan Your Own Investigation 10-A, Comparing Conductivity, p. 429
E2.4 plan and carry out inquiries to determine and compare the conductivity of various materials (e.g., metals, plastics, glass, water) [IP, PR, AI, C]	Plan Your Own Investigation 10-A, Comparing Conductivity, p. 429

E2.5 design, draw circuit diagrams of, and construct series and parallel circuits, and measure electric current *I*, potential difference *V*, and resistance *R* at various points in the circuits, using appropriate instruments and SI units [IP, PR, AI, C]	Activity 11-4, Measuring Current and Potential Difference in a Series Circuit, p. 459 Investigation 11-B, Loads in Series, pp. 474–475 Investigation 11-C, Loads in Parallel, pp. 476–477 Investigation 11-D, Testing Ohm's Law, p. 478
E2.6 analyse and interpret the effects of adding an identical load in series and in parallel in a simple circuit [AI, C]	Investigation 11-B, Loads in Series, pp. 474–475 Investigation 11-C, Loads in Parallel, pp. 476–477
E2.7 investigate the quantitative relationships between current, potential difference, and resistance in a simple series circuit [PR, AI]	Activity 11-4, Measuring Current and Potential Difference in a Series Circuit, p. 459 Investigation 11-B, Loads in Series, pp. 474–475
E2.8 solve simple problems involving potential difference *V*, electric current *I*, and resistance *R*, using the quantitative relationship $V = IR$ [AI, C]	Section 11.4, Measuring Electrical Resistance, pp. 462–467
E2.9 determine the energy consumption of various appliances, and calculate their operating costs [AI, C]	Section 12.2, Using Electrical Energy Wisely, pp. 492–500
E2.10 calculate the efficiency of an energy converter, using the following equation: percent efficiency = (*Eout* /*Ein*) × 100% [AI, C]	Section 12.2, Using Electrical Energy Wisely, pp. 492–500
E3. Understanding Basic Concepts	
E3.1 identify electrical quantities (i.e., current, potential difference, resistance, and electrical energy), and list their symbols and their corresponding SI units (e.g., electric current: *I*, ampere)	Section 11.2, Electrical Circuits: Analogies and Characteristics, pp. 446–454 Section 11.3, Measuring the Properties of Simple Circuits, pp. 455–461 Section 12.2, Using Electrical Energy Wisely, pp. 492–500
E3.2 explain the characteristics of conductors and insulators and how materials allow static charge to build up or be discharged	Section 10.1, Exploring Static Charges, pp. 403–410
E3.3 compare and contrast static electricity with alternating current (AC) and direct current (DC)	Section 12.1, Electricity at Home, pp. 485–491
E3.4 identify the components of a simple DC circuit (e.g., electrical source, load, connecting wires, switch, fuse), and explain their functions	Section 11.2, Electrical Circuits: Analogies and Characteristics, pp. 446–454 Section 11.3, Measuring the Properties of Simple Circuits, pp. 455–461
E3.5 explain the characteristics of electric current, potential difference, and resistance in simple series and parallel circuits, noting how the quantities differ in the two circuits	Section 11.5, Series and Parallel Circuits, pp. 468–471
E3.6 describe, qualitatively, the interrelationships between resistance, potential difference, and electric current	Section 11.4, Measuring Electrical Resistance, pp. 462–467
E3.7 explain what different meters (e.g., ammeters, voltmeters, multimeters) measure and how they are connected within an electrical circuit to measure electrical quantities	Section 11.3, Measuring the Properties of Simple Circuits, pp. 455–461
E3.8 explain how various factors (e.g., wire length, wire material, cross-sectional area of wire) influence the resistance of an electrical circuit	Section 11.4, Measuring Electrical Resistance, pp. 462–467

Suggested Course Materials

The following chart lists the items you may wish to use for a class of 30 using the *ON Science 9* program. The activities can be carried out by pairs or small groups of students, unless the instructions clearly specify that students should work on their own. Suppliers of science lab materials and equipment are listed in the suppliers' section of this Teacher's Resource.

Item Description	Suggested Quantity	Needed for These Units
NON-CONSUMABLE		
Ammeter	15	4
Balance (optional)	15	1
Balance, electronic	1	2
Base sockets for bulbs	45	3
Baseball	15	3
Battery (1.6 V C or D, 6 V, 9 V)	30 of each	3, 4
Battery Holder	45	3
Beads (coloured)	2000-3000 (200-300 of 10 different colours)	1
Beaker	75 × 250 mL 15 × 400 mL 15 × 100 mL 15 × 600 mL	1, 2, 3, 4
Bingo Chips	1000–1500	1
Books or Magazines about Monarch Butterflies and Ecotourism		1
Building Blocks, rectangular (labelled)	10 sets of 24	1
Calculator	15	1, 2, 3, 4
Checkers	800 (400 black, 400 red)	1
Clay (modeling)	7–8 kg	1, 2
Clothespin	15	3
Coloured Pencils	Several sets	1, 2, 3, 4
Comb	15 metal, 15 nylon	4
Connecting Leads	150	4
Connecting Wires	100	3, 4
Dictionary (Canadian)	5	1
Ebonite Rod	15	4
Electricity Bill	1	4
Electroscope	10	4
Erlenmeyer Flask (With Stoppers)	5	1
Flashlight	15	3

Flashlight Bulb	45	3, 4
Flashlight Filter (red)	15	3
Forceps	15	1
Fur, small pieces	15	4
Funnel	15 (small)	1
Glass Plate or Watch Glass	15	2
Graduated Cylinder	15 50-mL 15 100-mL 15 10-mL	1, 2
Hammer (small) or Mallet	15	2
Hook-up Wires or Clips	200	3
Hot Plate	10	2
Insulating Thread	5 m	4
Light-emitting Diode	15	4
Magnet, Bar (plus a couple of different strengths)	15	4
Magnifying Glass	15	1
Maps, local and Ontario	5	1
Marbles	100, some of different sizes	3, 4
Markers	Several sets	1, 2, 3
Measuring Cups and Spoons	assorted	2
Measuring Tape	10	3
Medicine Dropper	30	1, 2, 3
Metal Rings (or wire)	15	2
Metre Stick	15	3
Microscope (light)	15	1
Microscope slides	150	2
Nail (steel)	50	2
Paper clips	• 150 of each of 3 colours • 30 uncoated (optional) • 30 large	2, 4
Penny (copper)	15	2
Plastic Container (or zip close plastic storage bag)	15	1, 2
Probe	15	1
Protractor	15	3
Rectangular Pan (shallow)	15	3
Resistor	15	4

Retort Stand with a Clamp and Rod	15	4
Rubber Band	1 box	1
Ruler	15	1, 2, 3, 4
Sandpaper	15 pieces	2
Scissors	15	1, 2, 3, 4
Scoop	15	1, 2
Scoopula	30	2
Small Objects (coins, marbles, nuts, bolts, washers, and thimbles)	15	2
Steel, sheet	15 small pieces	2
Steel Wool	1 box	2, 4
Stopwatch	15	1, 2
String	1 ball	2, 3
Switch	30	4
Tablespoon	15	2
Talc	15 pieces	2
Test Tubes	• 100 (50 with stoppers) • 90 25-mL	1, 2
Test-Tube Rack	15	1, 2
Thermometer	15	2
Tubing (open at both ends)	2 m	4
Tongs	15	2
Tray	15	1
Trowel	15	1
Tweezers	15	1
Vollyeball	15	3
Voltmeter, or multimeter	15	4
Wire Coil	15	4
Wire strippers	5	2
Wool Cloth	15 small pieces	4
CONSUMABLE		
Adhesive Labels	45	1
Adhesive Notepaper (green, 4 cm x 4 cm)	500 sheets	1
Algae Culture	500 mL	1
Aluminum strips	15	2
Aluminum wire	1 m	4

Aluminum Foil	1 box	2, 4
Aquatic plants	15	1
Baking Soda (Sodium Bicarbonate)	1 kg	2
Balloon	50	2, 3
Borax (4%)	150 mL	2
Bottles, plastic (2 L)	30	1
Bottle, plastic (water)	15	2
Bromothymol Solution	100 mL	1
Broth (Beef or Chicken)	1500 mL	1
Calcium	15 small pieces	2
Carbon (charcoal)	15 small pieces	2
Carbon (graphite)	15 small pieces	2, 4
Cardboard	15 large pieces	1
Cereal, O-shaped	1 box	4
Chart Paper	1 pad	1
Coated Wire	5 m	4
Cobalt Chloride paper	15 pieces	2
Cocoa Powder	1 kg	3
Conductivity Tester	15	2, 4
Construction Paper	30 sheets	1, 3
Cooking Oil	500 mL	2
Copper strips	15	4
Copper (II) Sulfate	100 mL	2
Copper Wire	3 m	2, 4
Cornstarch	1 kg	2
Cotton Thread	1 spool	1
Covalent compounds (3 of menthol, oil of wintergreen, polypropylene rope, vegetable oil, thymol, or essential oils (geranium, rose))	15 mL of each	2
Cover Slips	100	1
Cups, plastic	50	1
Cups, foam	20	4
Dish Detergent	50 mL	1
Distilled Water	3 L	1, 2, 4
Drinking straw	1 box	1

Fertilizer	1 jar	1
Flour	10 kg	3
Food Colouring	1 bottle	2, 3
Freshwater Plant Sprigs (*Elodea* or similar species)	30	1
Glue (White)	150 mL	2, 3
Graph Paper	1 pad	1, 2, 3
Green Pea Seeds	75	1
Hydrochloric Acid (1.0 mol/L)	10 mL	2
Hydrogen Peroxide (3%)	100 mL	2
Ice	10 kg	2
Ionic compounds (3 of sodium chloride, copper sulfate, alum, ferrous ammonium sulfate, ammonium chloride)	15 mL each	2
Index Cards	300	2
Iron	15 strips	4
Limewater	100 mL	2
Liquid Fertilizer, with nitrogen and phosphorus	1 jar	1
Magnesium	200 g	2
Magnesium strips	15	2
Magnesium Sulfate	200 g	2
Marble or Limestone	15 small pieces	2
Methyl Cellulose	100 mL	1
Milk	1 L	2
Molasses	50 mL	2
Mossy Zinc	5 pieces	2
Nails, steel	50	2
Neon Glow Tube	15	4
Newspapers, current	A few	1, 2, 3
Owl Pellets	15	1
Paint Thinner	750 mL	1
Paper Towels	5 rolls	1, 4
Paramecium Culture	200 mL	1
Pepper	50 mL	4
Pie Pan (Alumnium)	15	4
Plant Food	500 mL	1
Plastic Bag (resealable) (250 mL and 1L)	15 of each	2

Plastic Spoons	30	2
Plastic Wrap	1 box	1, 3
Plate	15	4
Powdered Milk	100 g	3
Poster Paper (32 cm x 32 cm)	30	1
Raisins	50	2
Salt (Sodium Chloride)	5 kg	1, 2, 4
Sand	10 kg	3
Soil	25 L	1
Soil Test Kits for Nitrogen	15	1
Stir sticks, wood	30	2, 4
Styrofoam® ball	15	2
Sugar (Sucrose)	1 kg	2
Sulfur	200 g	2
Sulfuric Acid	1 L	4
Tape, masking	3 rolls	1, 4
Tape, adding machine	1 roll	3
Tin Strips	15	2
Toothpicks	1 box	1
Universal Indicator	100 mL	2
Vanilla Extract	50 mL	2
Vinegar	5 L	1, 2, 4
Wood	15 small blocks	4
Wooden Splints	30	2
Yeast	1 jar	2
Zinc	15 pieces	2
Zinc strips	15	4

Activity Planner

Activity/ Investigation/Project	Advance Preparation and Alternative Materials	Apparatus/Materials	Time Required
Chapter 1: Nutrient Cycles and Energy Flow			
Activity 1-1, How Disturbed Is Too Disturbed?	- Label blocks	24 smooth rectangular building blocks, labelled with environmental disturbances: (deforestation, disease, extinction, draining wetlands, drought, desertification, exotic species, global climate change, habitat fragmentation, hurricane, tsunami, flood, ice storm, meteor strike, nuclear bomb, overfishing, PCBs, DDT, excess nutrients in run-off, pollution (air, water, light), volcanic eruption, and wildfire)	• 5 min to label the blocks • 15 min to do the activity
Activity 1-2, What Symbol Would You Choose?	- Book computer lab	- 1 sheet construction paper - Tape or glue - Coloured markers - Internet access - Scissors - Computer lab	• 10 min to create a symbol • 10 min to discuss
Activity 1-3, Recycling in Ontario	- Book computer lab (optional)	- Graph paper - Coloured pencils - Ruler - Computer lab with spreadsheet software (optional)	• 20 min
Investigation 1-A. Fertilizers and Algae Growth	- Order or purchase plant material, soil, and fertilizer ahead of time - Algae samples could be gathered from a local pond.	- Balance - Scoop - 50 mL graduated cylinder - Small funnel - Five 250 mL beakers - Liquid fertilizer that contains nitrogen and phosphorus (enough for 5 samples) - Algae culture (enough for 5 samples) - 5 adhesive labels - Distilled water - Marker - BLM 1-26, Plan Your Own Investigation 1-A, Fertilizers and Algae Growth (optional) - BLM G-23, Data Table (Optional)	• 25–30 min for students to write a plan, set up a data table, and have the plan checked by you • 10–15 min for each student or group to set up beakers with algae and fertilizer • 1 week to monitor the experiment; it would be advisable to start with the activity on a Monday

Investigation 1-B, The Chemistry of Photosynthesis	– Order or purchase plant material, soil, and fertilizer	– 250 mL beaker – Water – Bromothymol solution – Drinking straw – 2 test tubes with stoppers – Test-tube rack – 1 sheet black paper – Masking tape – 2 freshwater plant sprigs (*Elodea* or similar species) – BLM 1-27, Inquiry Investigation 1-B, The Chemistry of Photosynthesis (optional)	• 15 min in class to set up plants and test tubes • Unless a strong light source is used, it will take more than one period to see a colour change.
Investigation 1-C, Soil-water Acidity and Plant Growth	– Order or purchase plant material, soil, and fertilizer ahead of time	– 5 small plastic or paper cups – Pencil – Marker – 500 mL potting soil – Tray – 50 mL graduated cylinder – Ruler – 5 stopped Erlenmeyer flasks, containing water with pH levels of 3, 4, 5, 6, and 7	• 1–2 h of preparation by teacher • 15 min for students to plant and water the seeds, and to place the cups on the trays • 2–4 weeks to complete the investigation • 5 min each day to water, and to record growth
Investigation 1-D, Can a Plant Have Too Much Fertilizer?	– Order or purchase plant material, soil, and fertilizer ahead of time	– 5 green pea seeds – 3–5 large cups – 750 mL soil – Garden trowel, or sturdy scoop – Marker – Water – Fertilizer that contains nitrogen (enough for 3–5 samples) – Soil test kits for nitrogen – BLM 1–29, Plan your Own investigation 1-D, Can a Plant Have Too Much Fertilizer? (optional)	• 15 min to create the data table and have a plan approved • 20 min to plant the seeds • 10 min to prepare the fertilizer • 5 min daily to monitor the plants • 2–4 weeks to collect the data
Chapter 2: Populations and Sustainable Ecosystems			
Activity 2-1, Reducing Wildlife Mortality with Fences	None	– Chart paper and markers (optional)	• 15 min
Activity 2-2, Graphing Population Change	– Book a computer lab	– 3 pieces of graph paper – Ruler – Coloured pencils – Computer lab (optional)	• 50–60 min
Activity 2-3, What Was for Dinner?	– Order owl pellets	– Owl pellet – Paper towel – Forceps, tweezers, or probe – Magnifying glass – BLM G-40, What Was for Dinner? Identification Key	• 30 min • 10 min to view on-line simulation

Activity 2-4, Ecotourism and Monarch Butterflies	- Book a computer lab - Obtain a few relevant resources from the library, such as books and magazines with information about monarch butterflies and ecotourism	- Computer lab with access to a publishing program and the Internet - Books and magazines with information about monarch butterflies and ecotourism	• 40 min, plus possible time at home to complete the pamphlet
Data Analysis Investigation 2-A, Is the Winter Skate Endangered in Nova Scotia?	- Book a computer lab (optional)	- Graph paper - Computer Lab (optional) - BLM 2-11, Data Analysis Investigation 2-A, Is the Winter Skate Endangered in Nova Scotia? (optional)	• 50 min
Inquiry Investigation 2-B, What Happens When Food Is Limited?	None	- 2 plastic cups with labels - Felt marker - 50 mL graduated cylinder - Paramecium culture - Medicine dropper - Yeast culture - Toothpicks - Methyl cellulose - 6 microscope slides - Scissors - 30 cm cotton thread - Tweezers - 6 cover slips - Light microscope - Plastic wrap - 2 rubber bands - Distilled Water - BLM 2-13, Inquiry Investigation 2-B, What Happens When Food Is Limited? (optional) - BLM G-23, Data Table (optional) - BLM A-15, Data Table Checklist (optional) - BLM G-20, Parts of a Microscope (optional)	• 40–70 min (initial set-up) • 3 weeks to run
Data Analysis Investigation 2-C, Putting your Foot in Your Mouth	None	- BLM 2-13, Data Analysis Investigation 2-C, Putting Your Foot in Your Mouth (optional)	• 30 min
Chapter 3			
Activity 3.1, Biodiversity in Canada	- Book computer lab	- Markers - Chart paper - Computer lab - Modelling clay	• 30 min

Activity 3.2, Biodiversity Index	- Create model ecosystems - Dried beans or pasta could be used instead of coloured beads. - Students could record on mini-whiteboards.	- Large number of coloured beads (20–30 each of 10 different colours if possible) - Plastic containers of some kind (gladware) or large zip close plastic storage bags	• 5 min to prepare data tables • 5 min to distribute model ecosystems • 5 min to record data for one ecosystem, (20 if doing 4 ecosystems) • Share information with class, summarize on blackboard (10 min) • 5–10 min for brief discussion • 10–15 min to answer questions in notes
Activity 3.3, Alien Invasions	- Book computer lab (optional) - Book LCD projector (optional)	- Paper any size including chart paper - Coloured pencils and markers - Computer lab and internet access (optional) - LCD projector (optional)	• 15 min to answer procedure questions • 10 min to create outline for poster • 20–40 min to draw and colour poster • Or 1–2 70 minute periods to create a web page
Activity 3.4, Plants at Risk	None	- Calculator - BLM 3-5, Writing a Persuasive Argument (optional) - BLM 3-6, Writing a Persuasive Argument (Alternative Version) (optional) - 8.5 × 11 or 8.5 × 14 inch paper - Coloured pencils or markers - Canadian dictionary	• 15 min to answer procedure questions • 15 min to design flyer • 15–20 min to write persuasive argument • 5 min to present to partner
Activity 3.5, The Common Good	None - Any small flat object that are difficult to pick up two at a time could be used instead of bingo chips.	- 300 to 400 bingo chips - watch, clock or stopwatch - paper to track points - Large cardboard (to go outside)	• 15 min (max) - 5 min to explain the rules - 30s to 2 min for one harvest - 5 min to score and replenish chips
Real World Investigation 3-A, Zebra Mussels in Lake Ontario	None	- BLM 3-9, Writing an Editorial (optional) - Graph paper - Coloured pencils	• 1.5 periods - 10 min for preamble about the importance of writing in science - 15 min to deconstruct and editorial - 15 min for graphing - 20–40 min for research time on internet - 10 min to write first draft of editorial - 10–20 min for peer edit - 15 min for second draft

Inquiry Investigation 3-B, Balancing Populations and the Environment	None - Game chips, math counters, or even small pieces of coloured paper could be used instead of checkers.	- 2 sheets of white poster paper (32 cm × 32 cm each) - ruler - sharp pencil - 32 squares of green adhesive notepaper (4 cm × 4 cm each) - bag of 100 checkers (50 black and 50 red) - Calculator - Graph paper	• One 70 min period - 10 min to read and repeat back instructions - 15 min to record hypothesis and set up data table - 10 min to set up park - 5 min to set up hunting screen - 5 min to establish wildlife management policy for park - 5 min to play one year of game & record data - 10 min to play subsequent 4 years of game & record data - 15 min to graph the data
Unit 1 Projects			
Inquiry Project: Pollutants and Aquatic Ecosystems	- Purchase the aquatic supplies ahead of time. - Several days before, ask students to bring in 2 L soft drink bottles until you have enough.	- Salt - 100 mL vinegar - 100 mL beef or chicken broth - 50 mL dish detergent - 50 mL plant food - 50 mL paint thinner - Seven 2 L soft drink bottles, or large jars, per group - Aquatic plants and organism for each ecojar - BLM A-44, Unit 1 Inquiry Investigation Rubric (optional) - BLM G-23, Data Table (optional)	• 15–20 min to create the plan and data table • 5–10 min to prepare each ecojar • 10 min to apply the treatments to each jar • 3–5 days to record the effects of each jar • 1 period to prepare the presentation, and 1 period for all students to present their findings.
An Issue to Analyze: Protecting Ecosystems	- Book a computer lab - Book a library period - Contact a local environmental group to see if they have resources that students might use	- Local newspapers and maps - BLM A-45, Unit 1 An Issue to Analyze Rubric (optional)	• 2 weeks (in and out of class) for research • 1 or 2 periods for presentations
Chapter 4: Properties of Elements and Compounds			
Activity 4-1, Raisin' Underwater Artifacts	None	- 50 mL water - 400 mL beaker - 100 mL graduated cylinder - 150 mL vinegar - 5 raisins - 25 g baking soda - Electronic balance	• 25 min
Activity 4-2, Safety First!	- Remind students to bring their textbooks, pens, pencils, paper, and so on.	None	• 10 min

Activity 4-3, Element, Compound, or Mixture?	– Assemble paper clips to model elements, compounds, and mixtures	– 3 sets of at least 10 paper clips, each set a different colour	• 10 min preparation time • 20 min class time
Activity 4-4, What's So Special About Paper Clips?		– 2 paper clips – Wire strippers (optional) – Uncoated paper clips (optional) – BLM XG-23, Data Table	• 5 min for preparation time • 10 min class time
Activity 4-5, Slow as Molasses		– 2 beakers of the same size – 2 scoopulas – 2 mL water – 2 mL molasses – 2 medicine droppers – Stopwatch	• 15 min for preparation • 15 min class time
Activity 4-6, Hard as Nails		– Piece of talc – Copper penny – Steel nail – BLM G-23, Data Table (optional)	• 15 min for preparation • 15 min class time
Activity 4-7, What's New?		– 4 g of sodium bicarbonate – 50 mL 5% acetic acid – Test-tube rack – Balloon – Test tube – 5 mL water – Universal indicator – Calcium	• 30 min for preparation • 20 min class time

Inquiry Investigation 4-A, Testing Physical Properties of Substances		– A small amount of each of the following:
		  – Aluminum
		  – Carbon (graphite)
		  – Copper (II) sulfate
		  – Magnesium sulfate
		– Water
		– Conductivity tester
		– Scoopula
		– Five 25 mL test tubes
		– Test-tube rack
		– 50 mL water
		– 10 mL graduated cylinder
		– BLM 4-14, Inquiry Investigation 4-A, Testing Physical Properties of Substances (optional)
		– BLM XG-23, Data Table (optional)
		– BLM A-26, Inquiry Investigation Rubric (optional)
			• 60 min for preparation
			• 45 min for class time

Inquiry Investigation 4-B, Chemical Properties of Common Gases		- 10 mL of 1.0 mol/L hydrochloric acid - 4 test tubes - Test-tube rack - Mossy Zinc - Rubber stopper - Test-tube holder - 2 wooden splints - 5 mL 3% hydrogen peroxide - Yeast - Marble or limestone - 5 mL limewater - Balloon - Cobalt chloride paper - BLM 4-15, Inquiry Investigation 4-B, Chemical Properties of Common Gases (optional)	• 60 min for preparation • 60 min class time
Plan Your Own Investigation 4-C, Properties of Common Substances		- Table sugar (sucrose) - Baking soda (sodium bicarbonate) - Aluminum strips - Tin strips - Cooking oil - Vinegar (5% acetic acid in water) - Test tubes - Test-tube rack - Scoopula - BLM 4-16, Plan Your Own Investigation 4-C, Properties of Common Substances (optional) - BLM G-23, Data Table (optional) - BLM A-27, Plan Your Own Investigation Rubric (optional) Other equipment, as needed, to perform tests: - Conductivity tester - Hot plate - Small hammer or substitute - Electronic balance - Other glassware	• 45 min preparation time • 70 min class time
Real World Investigation 4-D, CFC Production and Canada's Ozone Layer	None	- Graph paper - Ruler - Coloured pens or pencils (optional) - Calculators (optional) - BLM 4–17, Real World – Investigation 4-D, CFC Production and Canada's Ozone Layer (optional) - BLM G-25, Constructing a Line Graph (optional) - BLM G-26, Interpreting Line Graphs (optional) - BLM A-28, Real-World Investigation Rubric	• 40 min class time

Chapter 5: Understanding the Properties of Elements			
Activity 5-1, The Atomic "Black Box"	None	- Modelling clay - Simple objects (such as coins, marbles, nuts, bolts, washers, and thimbles)	• 30 min class time
Activity 5-2, How Small Is Too Small?		- Round-tipped scissors - Strip of paper (28 cm × 2.5 cm)	• 10 min for preparation • 10 min class time
Activity 5-3, Atomic Model Time Line		- Graph Paper - Coloured pencils	• 5 min for preparation • 40 min class time
Activity 5-4, What's Your Number?	None	- Appendix A: Properties of Common Substances - BLM G-23, Data Table (optional)	• 30 min class time
Activity 5-5 Make Your Own Atom		- Metal rings (3 different sizes) or wire - Styrofoam® ball - Modelling clay (3 different colours) - String - BLM A-6, Developing Models Checklist (optional)	• 30 min for preparation • 50 min class time
Activity 5-6, What's in Blackbock's Lake?		- BLM 5-7, Activity 5-6, What's in Blackbock's Lake (optional) - BLM G-23, Data Table (optional)	• 30 min for preparation • 30 min for activity
Activity 5-7, The Bohr-Rutherford Periodic Table	None - Pieces of paper could be used instead of index cards.	- 20 Bohr-Rutherford index cards, which students made in Inquiry Investigation 5-A	• 30 min class time
Inquiry Investigation 5-A, The Bohr-Rutherford Model of the Atom		- 20 blank index cards - BLM 5-10, Inquiry Investigation 5-A, The Bohr-Rutherford Model of the Atom (optional)	• 5 min for preparation • 60 min for class time
Inquiry Investigation 5-B, Physical Properties of Metals and Non-Metals		Small amounts of: - Carbon (charcoal) - Sulfur - Aluminum - Magnesium - Mallet - Conductivity Tester - BLM 5-11, Inquiry Investigation 5-B, Physical Properties of Metals and Non-metals (optional) - BLM G-23, Data Table (optional) - BLM A-26, Inquiry Investigation Rubric (optional)	• 30 min for preparation • 30 min class time

Inquiry Investigation 5-C, Reactivity Trends in the Periodic Table	- Prepare HCl	- Water - 3 test tubes - Test-tube rack - Aluminum - Calcium - Magnesium - 1 mol/L acid solution (HCl) - BLM 5-12, Inquiry Investigation 5-C, Reactivity Trends in the Periodic Table (optional) - BLM G-23, Data Table (optional) - BLM A-21, Safety Checklist (optional)	• 30 min for preparation • 45 min class time
Chapter 6: Understanding the Properties of Elements			
Activity 6-1, Bouncing Glue		- 10 mL white glue - 100 mL beaker - Tablespoon - Wooden stir stick - Food colouring - 10 mL of 4% borax solution	• 20 min for preparation • 20 min class time
Activity 6-2, Making Ice Cream	Two weeks before: - Buy sufficient resealable plastic food bags and ice	- Measuring cups and spoons - Plastic spoons - 5 mL of sugar - 3 drops of vanilla extract - 250 mL resealable plastic bag - 500 mL of ice - 150 mL of rock salt (sodium chloride) - 1 L resealable plastic bag - Thermometer - Sheet of newspaper	• 30 min for preparation • 60 min class time
Activity 6-3, Cornstarch Plastic		- 75 mL of cornstarch - 250 mL beaker - 45 mL of water - Sturdy spoon or stir stick - Graduated cylinder	• 15 min for preparation • 30 min class time
Activity 6-4, Representing Compounds Using Bohr-Rutherford Models	None	None	• 30 min class time
Activity 6-5, Ball-and-Stick Models		- Molecular model kit - Sharp permanent markers (optional)	• 5 min for preparation • 60 min class time

Inquiry Investigation 6-A, What Causes Rusting of Iron Nails?	Two weeks before: - Buy 45 uncoated round steel nails for each class	- Fine sandpaper - 3 clean, dry nails - 3 clean, dry test tubes - 3 clean, dry rubber stoppers - Water - Table salt - Test-tube rack - BLM 6-12, Inquiry Investigation 6-A, What Causes Rusting of Iron Nails? (optional)	• 45 min to setup • 15 min for observations
Inquiry Investigation 6-B, Properties of Ionic and Covalent Compounds	One month before: - Check for supplies of appropriate ionic and covalent compounds, and purchase some if necessary	- 6 test tubes - 6 samples of compounds (See Activity Notes for suggestions) - Glass plate or watch glass - Scoop - Plastic water bottle - Hot plate - Aluminum foil - Distilled Water - Tongs - BLM 6-13, Inquiry Investigation 6-B, Properties of Ionic and Covalent Compounds (optional)	• 30 min for preparation • 70 min class time
Data Analysis Investigation 6-C, Classification of Household Substances	None	- BLM 6-14, Data Analysis Investigation 6-C, Classification of Household Substances (optional)	• 15 min class time
Unit 2 Projects			
Inquiry Investigation: Rust Prevention	Two or three days before: - Gather the materials. - Ask students to bring in coatings they would like to test.	- Uncoated steel nails - Sheet steel - Steel wool - Test tubes with stoppers - Copper sulfate solution - Coatings, as supplied by students - Other metals, such as copper wire, magnesium strips, aluminum foil, zinc - Salt - BLM A-46, Unit 2 Inquiry Project Rubric (optional) - BLM G-7, Design Your Own Investigation (optional) - BLM A-3, Designing an Experiment Checklist (optional)	• 20 min preparation • 2 or 3 days in class
An Issue to Analyze: The Impact of Metal Mining	One week before: Gather some research materials, and/or reserve computer lab time.	- BLM A-47, Unit 2 An Issue to Analyze Rubric (optional) - BLM G-14, Debating Procedures (optional) - BLM G-15, Debate Organizer (optional) - BLM G-12, Scientific Research Planner (optional) - BLM G-17, Worksheet for Investigating Issues (optional)	• 30 min class time

Chapter 7: The Night Sky			
Activity 7-1, Create Your Own Constellation	None	- Blank Paper - Coloured markers - BLM 7-4, A Star Field (optional)	• 15–20 min to prepare and develop constellations, to write a story or draw a picture, and to trade and discuss the story or picture with other students • Some students may wish to finish their story at home
Activity 7-2, Angle of Sunlight	None	- Non-LED flashlight with a wide beam - Sheet of graph paper - Ruler - Protractor - Notebook - String (optional) - Calculator	• 15–20 min to take the measurements and answer questions
Activity 7-3 Modelling the Solar System	None	- Calculator - Construction paper - Coloured markers or pencils - Scissors - Long white paper tape - Glue or tape - Metre stick - Long measuring tape (optional)	• 45 min in class
Activity 7-4, Making Craters	None	- Newspaper - Shallow, rectangular pan - Sand - Flour - Cocoa powder - 3 marbles, each a different size - Metric ruler, or metre stick	• 20–30 min
Inquiry Investigation 7-A, Modelling the Moon's Movement	None	- Flashlight or overhead projector - Volleyball - Baseball - String, about 0.5 m - Wide-point, water-soluble black marker - Large sheet of white paper - BLM 7-17, Inquiry Investigation 7-A, Modelling the Moon's Movement (optional)	• 15–20 min to take the measurements and answer questions

Inquiry Investigation 7-B, The Changing View of the Night Sky	None	– A list of visible planets – Coloured pencils – Flashlight with a red filter such as red cellophane (Red light does not interfere with night vision) – A clipboard or hard surface to use under star maps – BLM 7-18, Inquiry Investigation 7-B, The Changing View of the Night Sky (optional) – BLM G-42, Star Maps for Fall, Winter, and Spring (or Appendix B, Using Star Maps, on page 570 of the student textbook) – BLM G-23, Data Table (optional)	• 20 min in class to prepare the data table and preview the instructions • 30 min in the evening to observe and record observations
Data Analysis Investigation 7-C, Gravity on Other Planets	None	– Library or computers with Internet access – BLM 7-19, Data Analysis Investigation 7-C, Gravity on Other Planets (optional) – BLM G-23, Data Table (optional) – BLM A-29, Data Analysis Investigation Rubric (optional)	• 30–60 min to conduct the research, make the data table, and answer the questions
Chapter 8: Exploring Our Stellar Neighbourhood			
Activity 8-1, Preparing for a Trip to the Moon	None	– Large sheets of paper (11 × 17), markers	• 20–40 min for each group to plan • 10 min to discuss the questions
Activity 8-2, An Astronomer's View	None	– Piece of plastic wrap, about 15 cm long	• 15 min to take the observations and answer questions
Plan Your Own Investigation 8-A, The Brightness of Stars		– Six 1.6 V C or D battery cells – Six hook-up wires with clips – Three 5 V (4.8 V) incandescent flashlight bulbs – 3 base sockets for bulbs – 3 battery holders – Sufficient connecting wires with connecting clips for 3 lamps – Metric tape measure – BLM 8-10, Plan Your own Investigation 8-A, The Brightness of Stars (optional) – BLM G-23, Data Table (optional) – BLM A-27, Plan Your Own Investigation Rubric (optional)	• 15 min to plan and set up the display • 20 min to collect and record data and answer the questions
Inquiry Investigation 8-B, Using Spectral Analysis to Identify Star Composition	None	– Ruler – BLM 8-11, Inquiry Investigation 8-B: Using Spectral Analysis to Identify Star Composition	• 15–20 min
Data Analysis Investigation 8-C, Building an H-R Diagram	None	– BLM G-41, Build an H-R Diagram – BLM 8-12, Data Analysis Investigation 8-C: Building an H-R Diagram (optional)	• 15–20 min to plot the points and answer questions

Chapter 9: The Mysterious Universe			
Activity 9-1, Matter in Motion	None	- 600 mL beaker of plastic cup - Warm water - Medicine dropper - Small samples of food colouring, cocoa powder, and powdered milk	• 30–40 min to make the observations and answer questions
Activity 9-2, How big Is the Milky Way Galaxy?	None	- Calculator	• 20–30 min
Activity 9-3, Counting Galaxies by Sampling	None	- Image of galaxies taken by HST - BLM 9-6, Hubble Deep Field View (optional)	• 20–30 min
Inquiry Investigation 9-A, Estimating the Age of the Universe	None	- Ruler - Calculator - BLM 9-11, Inquiry Investigation 9-A, Estimating the Age of the Universe (optional) - BLM G-23, Data Table (optional) - BLM 9-12, Finding the Slope of a Line (optional)	• 30 min
Inquiry Investigation 9-B, Modelling the Expanding Universe	None	- Marker, black or blue - Balloon (light colours only and with no marks on it) - Clothespin - String - Ruler - BLM 9-13, Inquiry Investigation 9-B, Modelling the Expanding Universe (optional) - BLM G-23, Data Table (optional)	• 30 min
Unit 3 Projects			
Inquiry Investigation: Simulating a Cosmic Event	One month before: - Collect newspaper articles or magazines on recent astronomy events. One week before: - Book the computer lab.	- Computer with Internet access - newspaper and magazine articles about recent astronomy events - BLM 9-14, Inquiry Investigation, Simulating a Cosmic Event (optional) - BLM A-48, Unit 3 Inquiry Investigation Rubric (optional)	• 1–2 weeks (in and out of class) for research • 1–2 h to write, practise and deliver presentations.
An Issue to Analyze: Canadian Space Missions: To Go or Not to Go?	One month before: - Contact the Canadian Space Agency and NASA for materials on their programs. One week before: - Book the computer lab.	- Computer with Internet access - BLM 9-15, An Issue to Analyze, Canadian Space Missions: To Go or Not to Go? (optional) - BLM A-49, Unit 3 An Issue to Analyze Rubric (optional) - BLM G-16, Tips for Investigating Many-Sided Issues (optional) - BLM G-17, Worksheet for Investigating Issues (optional)	• 1–2 weeks (in and out of class) for research • 1–2 h to prepare reports and presentations

Chapter 10: Static Charges and Energy			
Activity 10-1, Lightning in a Glow Tube	A few weeks before: - Begin gathering materials for the activity. Foam cups, foam plates, and aluminum pie pans can be purchased at dollar stores, or students could be asked to bring them from home. Neon glow tubes or bulbs are available in most electronics stores.	- Masking tape - Foam cup - Aluminum pie pan - Foam plate - Wool cloth - Neon glow tube	• 25 min in class • 10 min to assemble a set of materials beforehand, if you wish to show students what they look like
Activity 10-2, Detecting Static Charge Using an Electroscope	A few months before: - Order or borrow enough electroscopes so that each pair of students or a small group has one electroscope to use	- Materials in an electrostatic series: glass, human hair, nylon, wool, fur, silk, cotton, Lucite, rubber balloon, polyester, plastic foam, grocery bags, ebonite - Metal leaf electroscope - Pith ball electroscope - BLM G-23, Data Table (optional)	• 45 min in class
Activity 10-3, Drawing Charges You Cannot See	None	- Paper - Coloured pencils	• 30 min in class
Activity 10-4, A Static Spice Separator	None	- Salt - Plastic Spoon or ruler - Pepper - Paper - Wool Cloth	• 15 min in class
Plan Your Own Investigation 10-A, Comparing Conductivity	A few weeks before: - Order and begin to gather the materials for the activity	- Conductivity tester - Aluminum (strip or wire) - Coated wire - Copper wire - Small block of wood - Graphite - Metal comb - Nylon comb - Beaker - Distilled water - Tap Water - Salt - Stir stick - BLM 10-20, Plan Your Own Investigation 10-A, Comparing Conductivity (optional) - BLM G-23, Data Table (optional)	• 45 min in class

Plan Your Own Investigation 10-B, Be a Charge Detective	A few weeks before: - Order and begin to gather the materials for the activity - Students could be asked to bring some of these materials from home.	- Pith ball electroscope - Some materials from Table 10.1 in Section 10.1 on student textbook page 405 - Some materials that are not in Table 10.1 (for example wood, paper, plastic wrap, a plastic compact disc case) - BLM 10-22, Plan Your Own Investigation 10-B, Be a Charge Detective (optional) - BLM A-27, Plan Your Own Investigation Rubric (optional)	• 50 min in class - 5 min for planning - 25 min for carrying out the activity - 20 min for discussion
Chapter 11: Electric Circuits			
Activity 11-1, Shed Light On It	A few days before: - Gather the materials for the activity	- D cell in cell holder - Flashlight bulb in a holder - Switch - 3 connecting wires - Strip of aluminum foil	• 15–20 min in class
Activity 11-2, Make a CELLection	A few days before: - Book the library and/or computer lab	- BLM G-23, Data Table (optional)	• 30 min in class
Activity 11-3, Charged Cereal and Moving Marbles	A few days before: - Gather the materials for the activity	- Ebonite rod - Fur - Cereal (4 pieces) - Insulating thread - Scissors - Retort stand with a clamp and rod - Marbles or ball bearings (enough to fill tubing, plus one) - Tubing (open at both ends)	• 20 min in class
Activity 11-4, Measuring Current and Potential Difference in a Series Circuit	A few days before: - Gather the materials for the activity	- Switch - Flashlight bulb - 6 connecting wires - Voltmeter - Cell - Ammeter	• 30–35 min in class

Inquiry Investigation 11-A, Constructing and Comparing Voltaic Cells	A few days before: - Gather the materials for the activity - Store the sulfuric acid according to the warning label and health and safety regulations	- Variety of metal strips (aluminum, copper, iron, zinc) - Steel wool - Small beaker (100 mL) - Electrolyte: vinegar or dilute sulfuric acid (about 40 mL) - 2 large paper clips - Voltmeter or multimeter (if available, probeware may be used) - Connecting leads - Light-emitting diode (optional) - Paper towel - BLM 11-14, Inquiry Investigation 11-A, Constructing and Comparing Voltaic Cells (optional) - BLM G-23, Data Table (optional)	• 20 min in class (if each group is assigned only one pair of electrodes to make a voltaic cell)
Inquiry Investigation 11-B, Loads in Series	A few days before: - Gather the materials for the activity	- Battery (6 V) - 3 identical flashlight bulbs in holders - Battery (9 V) (optional) - Ammeter - Switch - Voltmeter - 8 connecting leads - BLM 11-15, Inquiry Investigation 11-B, Loads in Series (optional) - BLM G-23, Data Table (optional)	• 45 min in class
Inquiry Investigation 11-C, Loads in Parallel	A few days before: - Gather the materials for the activity	- 1.5 V cell - 3 identical flashlight bulbs in holders - Switch - Voltmeter - 10 connecting leads - Ammeter - BLM 11-16, Inquiry Investigation 11-C, Loads in Parallel (optional) - BLM G-23, Data Table (optional)	• 40 min in class
Inquiry Analysis Investigation 11-D, Testing Ohm's Law	A few days before: - Gather the materials for the activity	- Resistor - Ammeter - Voltmeter - Cells, batteries, or a variable power supply - 6 connecting leads - BLM 11-17, Inquiry Investigation 11-D, Testing Ohm's Law (optional) - BLM G-23, Data Table (optional)	• 30 min in class
Chapter 12: Generating and Using Electricity			
Activity 12-1, Generating an Electric Current	A few days before: - Gather the materials for the activity	- Wire coil (optional: coils of different size) - 2 connecting wires - Ammeter (centre zero) - Bar magnet (optional: magnets of different strength)	• 15 min in class

Technology Investigation 12-A, Designing a Staircase Circuit	A few days before: - Gather the materials for the activity	- Battery (6 V) - Connecting Wires - Flashlight bulb in holder - 2 three-connection switches - BLM 12-14, Technology Investigation 12-A, Designing a Staircase Circuit (optional)	• 30 min in class
Real World Investigation 12-B, An Electrical Energy Audit	None	- BLM 12-15, Real World Investigation 12-B, an Electrical Energy Audit (optional) - BLM G-23, Data Table (optional) - BLM A-28, Real World Investigation Rubric (optional)	• 15 min in class to explain the investigation and have students set up the data table. • Students will monitor their energy consumption at home for one week • 25 min in class to complete and discuss the activity
Data Analysis Investigation 12-C, A "Dry" Investigation	None	- Calculator - BLM 12-16, Data Analysis Investigation 12-C, A "Dry" Investigation (optional) - BLM A-29, Data Analysis Investigation Rubric (optional) - BLM A-5, Investigating an Issue Checklist (optional)	• 40 min in class
Plan Your Own Investigation 12-D, Every Kilowatt Counts	None - You could supply one electricity bill (with name and address obscured) and photocopy it for the class.	- Copy of a recent electricity bill - Computer and spreadsheet program - BLM 12-17, Plan Your Own Investigation 12-D, Every Kilowatt Counts (optional) - BLM A-27, Plan Your Own Investigation Rubric (optional)	• 30 min in class, plus time at home for research
Unit 4 Projects			
Inquiry Investigation: Designing an Electrical Makeover	Two or three days before: - Gather materials	- Circuit board - Bulbs - Resistors - Wires - BLM 12-20, Inquiry Investigation, Designing an Electrical Makeover (optional) - BLM A-50, Unit 4 Inquiry Investigation Rubric (optional)	• 2–3 h (some could be assigned as homework)
An Issue to Analyze: A "Greener" Power Generation Mix	One month before: - Contact power companies for resources that students could use. One week before: - Book the computer lab.	- Computer with Internet access - BLM 12-22, An Issue to Analyze, A "Greener" Power Generation Mix (optional) - BLM A-51, Unit 4 An Issue to Analyze Rubric (optional) - BLM G-23, Data Table (optional)	• 1–2 weeks (in and out of class) for research • 40–50 min to organize information and create a report

SCIENCE SUPPLIERS

This list of suppliers includes suppliers of science equipment and materials, and also suppliers of technology materials that may be useful to you and your students for Investigations and for Unit Projects, in which students are encouraged to use their own ideas and plans to design and build devices and/or systems that provide a solution to a problem or challenge.

Note: At the end of certain suppliers' names, some words in boldface indicate a specific, recommended product line.

Advanced School Equipment

P.O. Box 488
Ponoka, AB T4J lS8
Telephone: 1-800-465-7737

B. & B. School Supplies

75 Watline Avenue
Mississauga, ON L4Z 3E3
Telephone: 1-800-668-1108
www.bbschoolsupplies.com

Boreal Laboratories Ltd.

399 Vansickle Road
St. Catharines, ON L2S 3T4
Telephone: 1-800-387-9393
Fax: 1-800-668-9106
www.boreal.com

Carolina Biological Supply Company

2700 York Road
Burlington, NC 27215-3398
Telephone: (877) 933-7833
Fax: 1-519-737-7901
www.carolina.com

Creative Learning Systems, Inc.

16510 Via Esprillo
San Diego, CA 9212 7-1708
Telephone: 1-800-458-2880
Fax: (619) 675-7707
www.elsinc.com

Edmund Scientific Products

3350 Dufferin Street
Toronto, ON M6A 3A4
Telephone: (416) 787-4582
Fax: (416)787-5140
www.edsci.com

Lasy Canada Ltd./Ltée

108 Lake Erie Place S.E.
Calgary, AB T2J 2L4
Telephone: (403) 271-7657
Fax: (403) 278-4863

Louise Kool & Galt Limited

180 Middlefield Road
Scarborough, ON M1S 4M6
Toll-free telephone: 1-800-268-4011
Telephone: (416) 293-0312
Fax: (416) 293-9543
www.louisekool.com

Edusource

c/o Jdms, The Fulfillment Co.
Box 771 Agincourt Station
Scarborough, ON M1S 5J2
Telephone: 1-800-565-6492
www.edusource.com

Efston Scientific Suppliers Inc.

3350 Dufferin Street
Toronto, ON M6A 3A4
Telephone: (416) 787-4581, (416) 787-4584
Fax: (416) 787-5140
www.escience.ca

Exclusive Educational Games of Excellence Inc.

243 Saunders Road
Barrie, ON L4M 6E7
Telephone: 1-800-563-1166
Fax: (705) 725-1167
www.exclusiveeducational.ca
Design & Technology Systems

Fisher Scientific Company of Canada

P.O. Box 4508 Station E
Ottawa, ON K1S 5A9
Telephone: 1-800-267-3556
www.fishersci.ca

Hoskin Scientific

4210 Morris Drive
Burlington, ON L7L 5L6
Telephone: (905) 333-5510
Fax: (905) 333-4976
www.hoskin.ca

IASCO

5724 West 36th Street
Minneapolis, MN 55416-2594
Telephone: 1-800-328-4827
www.iasco-tesco.com

LAB-VOLT (Quebec) Ltd.

675, Rue du Carbone
Québec, QC G2N 2K7
Telephone: 1-800-LAB-VOLT
Fax: (418) 849-1666
E-mail: ca@labvolt.com
www.labvolt.com

Michigan Products Inc. (MPI)

1200 Keystone Avenue
P.O. 24155
Lansing, MI 48909-4155
Telephone: (517) 393-0440
Fax: (517) 393-8884

Northwest Laboratories Ltd.

301-3060 Cedar Hill Road
P.O. Box 6100 LCD 1
Victoria, BC V8P 5L4
Telephone: 1-800-667-1707

PALCIK Educational Products Ltd.

3 – 601 Tradewind Drive
Ancaster, ON L9G 4V5
Telephone: 1-866-999-8939
www.palcikeducational.com

PASCO Scientific

10101 Foothills Boulevard
P.O. Box 619011
Rosewillow, CA 95678-9011
Telephone: 1-800-772-8700
www.pasco.com

Science Kit

777 East Park Drive
Tonawanda, NY 14150
Telephone: (800) 828-7777
Fax: 1-800-828-3299
www.sciencekit.com

The Science Source

P.O. Box 727
Waldoboro, ME 04572
Toll-free telephone: 1-800-299-5469
Telephone: (207) 832-6344
Fax: (207) 832-7281
www.thesciencesource.com

Spectrum Educational Supplies Ltd.

150 Pony Drive
Newmarket, ON L3Y 7B6
Telephone: 1-800-668-0600
Fax: 1-800-668-0602
www.spectrumed.com

Technology Teaching Systems

45 Basaltic Drive, Unit 2
Concord, ON L4K 1G5
Toll-free telephone: 1-800-265-3847
Telephone: (905) 660-3933

TORCOMP Systems Ltd.

7070 Pacific Circle
Mississauga, ON L5T 2A7
Toll-free telephone: 1-800-561-7520
Telephone: (905) 564-7272
www.torcomp.com

Trifolium Books Inc.

Fitzhenry & Whiteside Ltd.
195 Allstate Parkway
Markham, ON L3R 4T8
Telephone: 1-800-387-9776
Fax: 1-800-260-9777
www.fitzhenry.ca

TVOntario

Client Services
2190 Yonge Street
Box 200, Station Q
Toronto, ON M4T 2T1
Telephone: (416) 484-2600
www.tvontario.org
Eureka Video Series

Weigl Educational Publishers Inc.

6325–10th Street S.E.
Calgary, AB T2H 2Z9
Toll-free telephone: 1-800-668-0766
www.weigl.ca
Career Connections Series