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***KINDERGARTEN TO SENIOR 1 SCIENCE  
LEARNING RESOURCES:  
ANNOTATED BIBLIOGRAPHY***

*A Reference for Selecting  
Learning Resources  
(September 2001)*

***2001***

Manitoba Education, Training and Youth

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## PREFACE

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*Kindergarten to Senior 1 Science Learning Resources: Annotated Bibliography: A Reference for Selecting Learning Resources (September 2001)* is a reference tool provided by Manitoba Education, Training and Youth to help educators select student and teacher learning resources that support Kindergarten to Senior 1 science instruction. The annotated bibliography describes strengths and weaknesses (if applicable) of each resource listed. It is intended to be used as a reference for selecting learning resources along with the *Manitoba Text Book Bureau Catalogue of Learning Resources*, which includes a listing of science learning resources, as well as ordering information and prices. These resources can also be purchased by visiting the online version of The Manitoba Text Book Bureau catalogue: <<http://www.mtbb.mb.ca>>.

This bibliography may be used in conjunction with

- *Kindergarten to Grade 4 Science Learning Resources: Annotated Bibliography: A Reference for Selecting Learning Resources (January 2000)* MTBB stock number 80357
- *Kindergarten to Grade 4 Science Learning Resources: Annotated Bibliography: A Reference for Selecting Learning Resources: Addendum (November 2000)* Available at <<http://www.edu.gov.mb.ca/ks4/learnres/bibliographies.html>>
- *Grades 5 to Senior 1 Science Learning Resources: Annotated Bibliography: A Reference for Selecting Learning Resources (November 2000)* Available at <<http://www.edu.gov.mb.ca/ks4/learnres/bibliographies.html>>

The learning resources listed in *Kindergarten to Senior 1 Science Learning Resources: Annotated Bibliography: A Reference for Selecting Learning Resources (September 2001)* were reviewed in May and June 2001 for the purpose of identifying materials that support Manitoba's science curricula. Seventeen educators from across Manitoba participated in the reviews. All participants were selected by Manitoba Education, Training and Youth from superintendent nominations.

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# INTRODUCTION

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## Foreword

*Kindergarten to Senior 1 Science Learning Resources: Annotated Bibliography: A Reference for Selecting Learning Resources (September 2001)* identifies the science learning resources that are philosophically congruent with Manitoba's science curricula. The documents *Kindergarten to Grade 4 Science: Manitoba Curriculum Framework of Outcomes*, *Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes*, and *Senior 1 Science: Manitoba Curriculum Framework of Outcomes* identify prescribed student learning outcomes for Kindergarten through Senior 1 science in Manitoba. Student learning outcomes in science are divided into thematic clusters at each grade. In addition, a "0" (zero) cluster identifies overall skills and attitudes required for each grade.

A call for science resources was issued to publishers, producers, and distributors of science materials. A team of teacher-evaluators from Manitoba schools examined the submissions and made recommendations regarding the suitability of the resources using a collaborative review process.

The selection of learning resources in this annotated bibliography was based on the fidelity with the rationale, philosophy, processes, and outcomes of *Kindergarten to Grade 4 Science: Manitoba Curriculum Framework of Outcomes*, *Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes*, and *Senior 1 Science: Manitoba Curriculum Framework of Outcomes*. All the resources included in this annotated bibliography have been designated as Kindergarten to Senior 1 science learning resources. Resources that match intended audiences and that aid in the implementation and achievement of prescribed learning outcomes have been identified.

## Special Thanks

In May and June 2001, 17 educators were selected by Manitoba Education, Training and Youth to review items that were received in response to the call to publishers for resource submissions. Manitoba Education, Training and Youth is grateful to the individuals involved in the review and selection processes for identifying the best student and teacher resources for Kindergarten to Senior 1 science curricula.

Appreciation is also extended to all school divisions within Manitoba that supported the teachers' participation in the review and selection processes.

Finally, appreciation is extended to the publishers, producers, and distributors who submitted resources designed for Manitoba's science frameworks.

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## Resource Selection Criteria

The learning resources in this annotated bibliography were selected according to the following criteria:

- **Curriculum Fit/Content/Philosophy:** Evaluators determined the suitability of each resource by considering the degree to which the content and processes of the resource align with the curricula, thus providing support for teacher implementation. Evaluators also determined the degree to which the resource provides for multiple approaches to learning, has a wide range of use, is current, and includes a variety of media formats.
- **Instructional Design:** Evaluators determined the appropriateness of the resource in terms of instructional design, determining the degree to which the resource stated instructional goals and learner outcomes, and addressed a variety of learning and teaching styles.
- **Social Considerations:** Evaluators determined the appropriateness of the resource in terms of social concerns. They considered the degree to which the resource is free of bias and stereotyping, includes Canadian content, utilizes culturally diverse examples, and accurately portrays First Nations, Inuit, and Métis peoples.
- **Technical Design:** Evaluators determined the appropriateness of the resource in terms of technical design, considering the degree to which the resource was visually interesting, appealing, and had a logical and consistent form.

When using this annotated bibliography to select learning and teaching resources, teachers should consider how the resources meet the learning requirements of students and the perspectives of their own student population.

Information on a specific learning resource may be obtained from the descriptive information in this annotated bibliography, as well as from the supplier, published reviews, colleagues, and an examination of the resource.

## Terms and Definitions

The following terms and definitions are used in this annotated bibliography to describe the learning resources:

- **Breadth:** identifies student learning resources that address a wide range of topics (with the highest possible level of fidelity with the curriculum framework) for a particular course/grade.
- **Depth:** identifies student learning resources (with the highest possible level of fidelity with the curriculum framework) that provide especially effective learning experiences for students for a particular grouping of student learning outcomes.
- **Breadth and Depth:** identifies comprehensive learning resources that provide both breadth and depth dimensions for a particular grouping of student learning resources.

- **Teacher Reference:** identifies resources that assist teachers in implementing Manitoba’s science curricula.
- **Teacher Content Reference:** identifies resources that include teaching suggestions and learning activities for the science classroom.
- **Teacher Guide:** identifies a separate guide for teachers or a teacher’s edition of a student text.

## Organization

The learning resources described in this annotated bibliography include references to the science clusters that comprise the Kindergarten to Senior 1 science curricula.

### Cluster Titles Chart: Kindergarten to Grade 4 Science

Grades Clusters	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
Cluster 0	Overall Skills and Attitudes (to be integrated into Clusters 1 to 4)				
Cluster 1	Trees	Characteristics and Needs of Living Things	Growth and Changes in Animals	Growth and Changes in Plants	Habitats and Communities
Cluster 2	Colours	The Senses	Properties of Solids, Liquids, and Gases	Materials and Structures	Light
Cluster 3	Paper	Characteristics of Objects and Materials	Position and Motion	Forces That Attract or Repel	Sound
Cluster 4		Daily and Seasonal Changes	Air and Water in the Environment	Soils in the Environment	Rocks, Minerals, and Erosion

## Kindergarten to Grade 4 Science Cluster Descriptions

### Kindergarten, Cluster 1: Trees

In Kindergarten, an investigation of trees capitalizes on students’ curiosity about the world around them. Students’ observations of trees, including their seasonal changes, are complemented by a study of basic parts and uses of trees.

### Kindergarten, Cluster 2: Colours

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Colour is an important part of the world around us. Through observations and the use of specific vocabulary, students develop their ability to describe their world in terms of colour. They also explore how to create colours by mixing them and where colours are found in the environment.

### **Kindergarten, Cluster 3: Paper**

By identifying, describing, and manipulating different kinds of paper and paper products found in the classroom, students are introduced to the concept of characteristics of materials. Hands-on investigations allow students to determine how well different kinds of paper can be cut, torn, and folded, and how these characteristics help to determine their uses. This study of paper culminates in students' developing their design-process skills by constructing a paper product for a particular use.

### **Grade 1, Cluster 1: Characteristics and Needs of Living Things**

Students in Grade 1 are interested in a wide variety of living things found in their local environments as well as in those from afar. In this cluster, a study of living things provides opportunities for students to discover the many different forms life takes. Students observe similarities and differences among living things and develop an understanding of their general characteristics. As a result, students become aware that all living things, including themselves, have needs. They discover that living things can often have similar needs, but that particular needs may be unique to individual living things. While the emphasis is on shared characteristics and needs among living things, diversity is also recognized, including the variations that make each human unique.

### **Grade 1, Cluster 2: The Senses**

Our awareness of the environment and the many materials that are found within it is based on our sensory experiences. Through our senses, we can detect items that may be good to eat, pose danger, or be useful. Our senses are immediate and automatic. But the ability to use our senses safely and effectively involves focus, discernment, awareness, and judgement. In this cluster, students learn more about what the senses are, how they operate, and how they must be protected. Students also refine their observation skills. These skills are critical to science (see Grade 1, Cluster 3: Characteristics of Objects and Materials) and can be applied to other subject areas.

### **Grade 1, Cluster 3: Characteristics of Objects and Materials**

In Grade 1, students are introduced to the concept of materials by exploring various objects in their immediate surroundings. Through these observations, students distinguish between objects and materials, learning that objects are made from materials with specific characteristics. They are also able to describe these characteristics clearly and precisely. By making objects from various materials, they begin to understand the connection between a material's characteristics and the specific purpose(s) for which the material is used.

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### **Grade 1, Cluster 4: Daily and Seasonal Changes**

By observing their environment, students become aware of changes that can occur within it, such as changes in temperature, wind, and light, and in plant and animal life. Through observations and investigations, students learn that changes often occur in cycles, including the relatively short cycle of day and night and the longer cycle of the seasons. Recognizing these cyclical patterns prepares students to deal with daily and seasonal changes. Particular attention is given to studying ways in which humans are able to live comfortably throughout the seasons.

### **Grade 2, Cluster 1: Growth and Changes in Animals**

In Grade 2, students focus on animals to build upon their knowledge of living things (see Grade 1, Cluster 1: Characteristics and Needs of Living Things). All animals grow and change from birth until adulthood. Because children are interested in the changes that take place over the lifetime of different animals, observing these changes becomes a powerful learning experience for them. In their explorations of growth, students compare their own growth with the growth patterns of various animals, and they learn about the conditions needed to support healthy development. Particular attention is given to the nutritional requirements of humans.

### **Grade 2, Cluster 2: Properties of Solids, Liquids, and Gases**

When students examine materials in the world around them, they become aware of the similarities and differences in their characteristics, such as the ways materials look, feel, sound, or change. In Grade 2, students begin to develop an understanding of matter by investigating properties of solids and liquids. Gases are also introduced through an examination of the properties of air. Students investigate ways in which solids and liquids interact, and identify how the properties of solids and liquids determine their uses. Students observe how water can be made to change from one state to another and back again. Students also encounter changes of state in the study of the water cycle in Grade 2, Cluster 4, Air and Water in the Environment. Teachers are encouraged to help students make connections between these learning experiences.

### **Grade 2, Cluster 3: Position and Motion**

The study of position and motion helps children develop a sense of space as well as an understanding of the relationship between stationary and moving objects, including themselves. Through observations and the use of specific vocabulary, students develop their ability to describe the position and motion of objects and recognize the effects of pushes and pulls on the motion of an object. In exploring motion, students investigate inclined planes, and wheels and axles as types of simple machines. They determine how these simple machines make it easier to move things and how friction affects the motion of objects.

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### **Grade 2, Cluster 4: Air and Water in the Environment**

Air and water are major parts of our physical environment and are essential for life. Yet our awareness of them is often limited, largely because we identify them only in their most obvious and observable forms. Through investigations, students learn about the characteristics of air, and the various forms of water in the environment. Students continue to build their understanding of the nature of science by describing evidence of the water cycle (see Grade 2, Cluster 2: Properties of Solids, Liquids, and Gases) and of moving air in indoor and outdoor environments. In the process, students discover the many ways in which air and water contribute to the health and survival of living things, including themselves.

### **Grade 3, Cluster 1: Growth and Changes in Plants**

In Grade 3, the study of living things focusses on the characteristics and needs of plants and their growth patterns. Students observe and investigate local plants, but a deeper understanding and appreciation is developed through planting, nurturing, and observing individual plants over time. Connections are made to students' prior knowledge of animal needs (see Grade 2, Cluster 1: Growth and Changes in Animals) by identifying needs that are similar between plants and animals and how those needs are met. This cluster addresses the importance of plants to the environment as well as the significance of food, shelter, medicine, and other plant products to humans. Emphasizing the connection between this cluster and Grade 3, Cluster 4: Soils in the Environment develops the relationship between plants and the soils in which they are grown.

### **Grade 3, Cluster 2: Materials and Structures**

Students learn about the nature of materials not just by observing them but, more importantly, by using them. In this cluster, students experience the design process as they manipulate and test materials, build structures, and select and use materials suitable to the task at hand. Students find that the strength and stability of structures in their community, as well as those they build themselves, are linked to the properties of the materials used and to the particular way the materials are configured and joined. This cluster further develops the concept of materials introduced in Kindergarten, Cluster 3: Paper and built upon in Grade 1, Cluster 3: Characteristics of Objects and Materials.

### **Grade 3, Cluster 3: Forces that Attract or Repel**

In Grade 3, students build on their initial awareness of forces as pushes or pulls (see Grade 2, Cluster 3: Position and Motion). In this cluster, the focus is on forces that act without direct contact: gravity, magnetism, and static electricity. Students describe evidence that shows that objects and living things on or near Earth are affected by a force called gravity, enhancing their understanding of the nature of science. Through their investigations, they determine that magnets have two poles and are surrounded by a magnetic field. They describe interactions of like and unlike poles, and compare Earth to a giant magnet. In addition, they identify ways of producing electrostatic charges using everyday materials. Students show how the strength of magnetic and electrostatic forces varies under

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different conditions. New understandings of gravity, magnetism, and static electricity are further refined as students identify and construct devices that use these forces.

### **Grade 3, Cluster 4: Soils and the Environment**

Soil provides a base for gardens, forests, fields, and farms, supporting plant and animal life, and human activities. By examining soils, students discover that soil composition and characteristics vary. Students also experiment to determine the impact of different soils on plant growth, thus improving their understanding of scientific inquiry processes. Students also learn the importance of animals and nutrient recycling to soil quality. Teachers are encouraged to help students develop the strong connection between soils and plants (see Grade 3, Cluster 1: Growth and Changes in Plants).

### **Grade 4, Cluster 1: Habitats and Communities**

As students in Grade 4 are familiar with the basic needs of plants and animals (see Grade 2, Cluster 1: Growth and Changes in Animals, and Grade 3, Cluster 1: Growth and Changes in Plants), they can begin to explore and compare ways in which plant and animal communities satisfy their needs in particular habitats. They begin to recognize the complex interactions that take place between plant and animal populations within a community. Through investigations, students study influences, both naturally occurring and human-caused, that can alter habitats and affect plant and animal populations. The cluster also addresses the roles traditional knowledge and technology play in learning more about and caring for plant and animal populations.

### **Grade 4, Cluster 2: Light**

In previous grades, students had an informal introduction to energy. In this cluster, students begin to examine in more depth one form of energy they encounter on a daily basis — light. In Grade 4, Cluster 3: Sound, students study another aspect of energy — sound. Whether these clusters are addressed separately or as part of a combined unit, the emphasis is on building an understanding of energy. Students become familiar with the properties of light by investigating and observing how light interacts with various objects in the environment. From these observations, students come to recognize that light travels in a straight line, knowledge which they will apply, along with their design-process skills, to the construction of simple optical devices.

### **Grade 4, Cluster 3: Sound**

In this cluster, students expand their concept of energy by examining sound. This cluster complements the study of another common form of energy — light, which is addressed in Grade 4, Cluster 2: Light. Sound is a phenomenon that can be observed, measured, and controlled in various ways. Understanding that sound is caused by vibrations helps students when they explore how sound travels, how the human ear is designed to detect sound, and how certain factors can modify the sound produced. The varying abilities of humans and other animals to detect sound is also examined, which, in turn, leads to discussions about the necessity of

protecting one’s sense of hearing. By investigating materials to ascertain whether they transmit, absorb, or reflect sound, students learn how these characteristics influence a material’s function. Students also explore the role of technology in extending one’s ability to produce, transmit, and detect sound.

**Grade 4, Cluster 4: Rocks, Minerals, and Erosion**

The study of rocks and minerals introduces students to geology. By examining various rocks and minerals found in the Earth’s crust, students learn about their characteristics and properties. These characteristics and properties determine how these rocks and minerals are used by humans. Students discover the role rocks play in forming soil (see Grade 3, Cluster 4: *Soils in the Environment*) and in providing us with information about Earth’s history. Students advance their understanding of the changing landscape by becoming aware of how wind, water, and ice continue to reshape it through erosion. This leads students to explore ways in which humans can adapt to and prevent or make changes in the landscape.

**Cluster Titles Chart: Grade 5 to Senior 1 Science**

<b>Grades Clusters</b>	<b>Grade 5</b>	<b>Grade 6</b>	<b>Grade 7</b>	<b>Grade 8</b>	<b>Senior 1</b>
Cluster 0	Overall Skills and Attitudes (to be integrated into Clusters 1 to 4)				
Cluster 1	Maintaining a Healthy Body	Diversity of Living Things	Interactions within Ecosystems	Cells and Systems	Reproduction
Cluster 2	Properties of and Changes in Substances	Flight	Particle Theory of Matter	Optics	Atoms and Elements
Cluster 3	Forces and Simple Machines	Electricity	Forces and Structures	Fluids	Nature of Electricity
Cluster 4	Weather	Exploring the Solar System	Earth’s Crust	Water Systems	Exploring the Universe

**Grade 5 to Senior 1 Science Cluster Descriptions**

**Grade 5, Cluster 0: Overall Skills and Attitudes**

Cluster 0 comprises nine categories of specific student learning outcomes (SLOs) that describe the skills and attitudes involved in scientific inquiry, the design process, or both.

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In scientific inquiry at Grades 5 and 6\*, students begin to develop the concept of a fair test. This includes developing a prediction/hypothesis that identifies a cause and effect relationship; controlling variables; repeating measurements to increase accuracy and reliability; and drawing conclusions that support or reject their initial predictions/hypotheses. In the design process, students continue to identify and address practical problems through the construction of a prototype. Increasingly sophisticated criteria are used to analyze a prototype, including use of recycled materials, cost, and reliability. Students begin to apply their problem-solving skills in the evaluation of consumer products based on identified criteria in order to determine the best product for a specific purpose. For example, in choosing between pre-packaged pizzas, the various factors of cost, nutritional value, and packaging may influence students' evaluation of the product.

Although the thematic clusters (Clusters 1 to 4) include certain skills and attitudes, Cluster 0 fully defines scientific inquiry and design process skills and attitudes at each grade level. Teachers should select appropriate contexts to introduce and reinforce Cluster 0 SLOs over the course of the school year. To assist in planning and to facilitate curricular integration, many SLOs within Cluster 0 are accompanied by links to SLOs in other subject areas, specifically English language arts (ELA) and mathematics (Math). There are also links to Technology As a Foundation Skill Area (TFS).

### **Grade 5, Cluster 1: Maintaining a Healthy Body**

The study of the human body at Grade 5 focuses on the maintenance of good health. Students learn about the role that nutrients play, and how to plan balanced and nutritious meals using *Canada's Food Guide to Healthy Eating*. Students gain experience in interpreting nutritional information on food labels, and in evaluating images presented by the media. A study of the major body systems and their role in the healthy functioning of the human body helps students to appreciate the nature and function of each, and the interrelationships that exist between systems. Students explore how lifestyle choices and environmental factors can affect personal health.

### **Grade 5, Cluster 2: Properties of and Changes in Substances**

In this cluster, students deepen their understanding of the characteristics and properties of substances, and the changes that occur in substances in different situations. Through their explorations, students identify the three states of matter — solids, liquids, and gases — and describe the properties of each. Students observe examples of reversible and non-reversible changes including changes of state. Students also investigate how the characteristics and properties of substances are altered during physical and chemical changes. Students identify examples of these changes in the world around them. Safety practices related to chemical products in the home are addressed. Students evaluate household products by using criteria such as efficiency, cost, and environmental impact.

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\* This description of Grade 5, Cluster 0 is also used to characterize Grade 6, Cluster 0: Overall Skills and Attitudes (see page xviii). However, the specific SLOs for Cluster 0 vary at Grade 5 and Grade 6.

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### **Grade 5, Cluster 3: Forces and Simple Machines**

In this cluster, students increase their understanding of forces through the study of simple machines. Emphasis is placed on investigating a variety of simple machines and recognizing their usefulness for moving and lifting loads. Students explore how simple machines are used in daily life, and they identify advantages and disadvantages of using simple machines for a given task. Students apply their knowledge of simple machines by designing, constructing, and evaluating a prototype.

### **Grade 5, Cluster 4: Weather**

In this cluster, students learn that daily weather conditions are not the result of random occurrences, but of global systems that can be predicted on a short-term and a seasonal basis. Through observations and measurements, students investigate the properties of air and other aspects of daily weather. Students learn to interpret public weather reports and investigate the usefulness of various ways of predicting the weather. Understanding the meaning of severe weather forecasts and the preparations to ensure personal safety are emphasized. Students recognize the role of technology in increasing scientific understanding of weather while appreciating the limitations in accurately predicting long-term weather trends. They also investigate factors that influence climate in Manitoba and across Canada.

### **Grade 6, Cluster 0: Overall Skills and Attitudes**

Cluster 0 comprises nine categories of specific student learning outcomes (SLOs) that describe the skills and attitudes involved in scientific inquiry, the design process, or both.

In scientific inquiry at Grades 5 and 6\*, students begin to develop the concept of a fair test. This includes developing a prediction/hypothesis that identifies a cause and effect relationship; controlling variables; repeating measurements to increase accuracy and reliability; and drawing conclusions that support or reject their initial predictions/hypotheses. In the design process, students continue to identify and address practical problems through the construction of a prototype. Increasingly sophisticated criteria are used to analyze a prototype, including use of recycled materials, cost, and reliability. Students begin to apply their problem-solving skills in the evaluation of consumer products based on identified criteria in order to determine the best product for a specific purpose. For example, in choosing between pre-packaged pizzas, the various factors of cost, nutritional value, and packaging may influence students' evaluation of the product.

Although the thematic clusters (Clusters 1 to 4) include certain skills and attitudes, Cluster 0 fully defines scientific inquiry and design process skills and

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\* This description of Grade 6, Cluster 0 is also used to characterize Grade 5, Cluster 0: Overall Skills and Attitudes (see page xvi). However, the specific SLOs for Cluster 0 vary at Grade 5 and Grade 6.

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attitudes at each grade. Teachers should select appropriate contexts to introduce and reinforce Cluster 0 SLOs over the course of the school year. To assist in planning and to facilitate curricular integration, many SLOs within Cluster 0 are accompanied by links to SLOs in other subject areas, specifically English language arts (ELA) and mathematics (Math). There are also links to Technology As a Foundation Skill Area (TFS).

### **Grade 6, Cluster 1: Diversity of Living Things**

In this cluster, students develop an appreciation of the diversity of living things. Students study a variety of classification systems, and construct and use their own as well as those developed by others. In doing so, they recognize the advantages and disadvantages of classification systems in organizing information. The animal kingdom provides a specific focus with students investigating different types of animals to understand where they fit in the classification of living things. Students compare and contrast the adaptations of closely related vertebrates living in different habitats, and the adaptations of vertebrates living today with those that lived in the past. Students learn about the contributions of individual scientists who have increased our understanding of the diversity of living things.

### **Grade 6, Cluster 2: Flight**

In this cluster, a study of the properties of fluids helps students to understand how flight can be achieved. Through the testing of models, students explore how the forces of thrust, drag, lift, and gravity act on living things or devices that fly through the air. They learn how specific adaptations or modifications can alter lift or drag. Different means of propulsion are compared and the use of unbalanced forces to steer aircraft and spacecraft are described. Students apply their understanding of forces and flight through the construction of a prototype that flies and meets specific performance criteria. Students also examine the history of the development of air travel and identify its impact on the way people work and live.

### **Grade 6, Cluster 3: Electricity**

In this cluster, students explore current and static electricity and compare and contrast the characteristics of each. These explorations help students identify and appreciate the importance of electricity in everyday life including the need for safe practices when using electricity. Students have the opportunity to apply their knowledge of series and parallel circuits in the construction of a prototype that performs a specific function. They demonstrate how electricity can be transformed into motion, and motion into electricity. Students also identify other types of transformations that can take place. Students discuss advantages and disadvantages of various renewable and non-renewable sources of electrical energy, and recognize the importance of energy conservation. The creation of an action plan to help reduce electrical energy consumption helps students understand the impacts they can make.

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### **Grade 6, Cluster 4: Exploring the Solar System**

In this cluster, students develop an understanding of the Earth in space, the solar system, and the role of space research programs in increasing scientific knowledge. Positive and negative impacts arising from space research programs are addressed, and the contributions of Canadians to these programs are highlighted. Students develop an appreciation for the nature of science by examining the changing conceptions of the Earth's position in space and by differentiating between astronomy and astrology. Students investigate the causes of phenomena such as the cycle of day and night, the yearly cycle of the seasons, moon phases, eclipses, and the reasons why the apparent movements of celestial bodies in the night sky are regular and predictable. An important distinction is made between weight and mass.

### **Grade 7, Cluster 0: Overall Skills and Attitudes**

Cluster 0 comprises nine categories of specific student learning outcomes (SLOs) that describe the skills and attitudes involved in scientific inquiry, the design process, or both.

In scientific inquiry at Grades 7 and 8\*, students build on the concept of a fair test developed in Grades 5 and 6. This includes developing a prediction/hypothesis that identifies a cause and effect relationship between dependent and independent variables; repeating experiments to increase accuracy and reliability; looking for alternative explanations for observations; recognizing strengths and weaknesses of different methods of collecting and displaying data; and determining potential sources of error. In the design process, students construct prototypes to solve practical problems and analyze them according to criteria such as cost, efficiency, and environmental considerations. Students continue to apply their problem-solving skills in the evaluation of consumer products in order to determine the best product for a particular purpose. This involves identifying priorities. For example, in choosing a brand of sunscreen, to what extent do cost, effectiveness, and the environmental track record of the company affect the decision?

Although the thematic clusters (Clusters 1 to 4) include certain skills and attitudes, Cluster 0 fully defines scientific inquiry and design process skills and attitudes at each grade. Teachers should select appropriate contexts to introduce and reinforce Cluster 0 SLOs over the course of the school year. To assist in planning and to facilitate curricular integration, many SLOs within Cluster 0 are accompanied by links to SLOs in other subject areas, specifically English language arts (ELA) and mathematics (Math). There are also links to Technology As a Foundation Skill Area (TFS).

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\* This description of Grade 7, Cluster 0 is also used to characterize Grade 8, Cluster 0: Overall Skills and Attitudes (see page xxii). However, the specific SLOs for Cluster 0 vary at Grade 7 and Grade 8.

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### **Grade 7, Cluster 1: Interactions within Ecosystems**

In this cluster, students investigate the complex interactions between organisms and their environment. Students identify biotic and abiotic components of ecosystems, and analyze the cycling of matter that takes place within them. This includes an investigation of the transfer of energy that occurs at various consumer levels, the implications of the loss of producers and consumers to the transfer of energy, and the potential for bio-accumulation within an ecosystem. Students explore ecological succession and assess the positive and negative impacts of human interventions on this natural process. Students discuss environmental, social, and economic factors that should be considered in the management and preservation of ecosystems. They propose a course of action that would help protect the habitat of a particular organism. Students observe micro-organisms with microscopes and discuss their beneficial and harmful roles. Students consider how knowledge of micro-organisms has improved food production and preservation techniques.

### **Grade 7, Cluster 2: Particle Theory of Matter**

In this cluster, students explore the nature of science by examining the development of scientific theories. One theory, the particle theory of matter, is investigated in detail. Students use the particle theory to describe changes of state, to differentiate between pure substances and mixtures, and to describe characteristics of solutions. An important distinction is made between heat and temperature. Students demonstrate how heat is transmitted by way of conduction, convection, and radiation. They plan and conduct experiments to identify substances that are good insulators and conductors of heat. They apply this knowledge through the design and construction of a prototype that controls the transfer of heat energy. Students also identify different forms of energy that can be transformed into heat energy, and recognize that heat is the most common by-product of other energy transformations. Students classify substances used in daily life as pure substances, mechanical mixtures, and solutions. They demonstrate different methods of separating the components of mixtures. Students experiment to determine factors that affect solubility. They describe the concentration of solutions in qualitative and quantitative terms, and demonstrate the differences between saturated and unsaturated solutions. The potential harmful effects of some substances on the environment are discussed, and methods to ensure safe use and disposal are identified.

### **Grade 7, Cluster 3: Forces and Structures**

In this cluster, students explore a variety of natural and human-built structures, and the forces that act on them. Students investigate internal and external forces acting on structures and recognize that these forces may affect structural strength and stability. Students identify common shapes used to increase strength and stability in structures, and methods used to enhance the strength of the materials used. The efficiency of a structure is assessed by comparing its mass with the mass of the load it supports. Students apply their understanding of forces and structures by evaluating the appropriateness of a specific structure's design, and by constructing a structure of their own that supports a given load and remains standing when a particular force is applied.

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### **Grade 7, Cluster 4: Earth's Crust**

In this cluster, students investigate Earth's geology, including rock and mineral formation, changes in the landscape over time, and human use of geological resources. Students describe processes involved in the location, extraction, processing, and recycling of geological resources found in Manitoba and Canada. Students recognize that soil is an important natural resource and they discuss the importance of soil conservation. Students identify environmental, social, and economic factors that should be considered in making informed decisions about land use. They examine theories explaining the Earth's geology, and recognize the role of technology in the development of new scientific theories. Specialized careers involving the science and technology of the Earth's crust are also explored.

### **Grade 8, Cluster 0: Overall Skills and Attitudes**

Cluster 0 comprises nine categories of specific student learning outcomes (SLOs) that describe the skills and attitudes involved in scientific inquiry, the design process, or both.

In scientific inquiry at Grades 7 and 8\*, students build on the concept of a fair test developed in Grades 5 and 6. This includes developing a prediction/hypothesis that identifies a cause and effect relationship between dependent and independent variables; repeating experiments to increase accuracy and reliability; looking for alternative explanations for observations; recognizing strengths and weaknesses of different methods of collecting and displaying data; and determining potential sources of error. In the design process, students construct prototypes to solve practical problems and analyze them according to criteria such as cost, efficiency, and environmental considerations. Students continue to apply their problem-solving skills in the evaluation of consumer products in order to determine the best product for a particular purpose. This involves identifying priorities. For example, in choosing a brand of sunscreen, to what extent do cost, effectiveness, and the environmental track record of the company affect the decision?

Although the thematic clusters (Clusters 1 to 4) include certain skills and attitudes, Cluster 0 fully defines scientific inquiry and design process skills and attitudes at each grade. Teachers should select appropriate contexts to introduce and reinforce Cluster 0 SLOs over the course of the school year. To assist in planning and to facilitate curricular integration, many SLOs within Cluster 0 are accompanied by links to SLOs in other subject areas, specifically English language arts (ELA) and mathematics (Math). There are also links to Technology As a Foundation Skill Area (TFS).

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\* This description of Grade 8, Cluster 0 is also used to characterize Grade 7, Cluster 0: Overall Skills and Attitudes (see page xx). However, the specific SLOs for Cluster 0 vary at Grade 7 and Grade 8.

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### **Grade 8, Cluster 1: Cells and Systems**

In this cluster, students investigate living things through a focus on cells and systems. Cell theory provides the basis for exploring cells and unicellular and multicellular organisms. Students identify major events and technological innovations that have enabled scientists to increase our understanding of cell biology. Microscopes are used to observe and compare the general structure and function of plant and animal cells. Students examine important processes that take place within the cell, including the movement of nutrients and wastes across cell membranes. The need for specialization of cells and tissues in multicellular organisms is discussed as are the structural and functional relationships among cells, tissues, organs, and systems. Investigations of the circulatory and respiratory systems highlight their importance to the body and lead to an understanding of how body systems function interdependently. Students identify components of the body's primary and secondary defense systems. They examine medical advances that enhance the human body's defence mechanisms, and research disorders and diseases that can affect body systems.

### **Grade 8, Cluster 2: Optics**

In this cluster, students broaden their understanding of how light is produced, transmitted, and detected. Students identify colours as different wavelengths of light, and explore why objects appear to have colour. Various types of electromagnetic radiation are compared. The potential positive and negative impacts of technological devices that use electromagnetic radiation are discussed. Students explore the principles and properties of reflection and refraction, and their application in everyday situations. Students investigate the characteristics of concave and convex mirrors and lenses. They enhance their understanding of how these devices function in a variety of optical tools. Students also demonstrate the formation of images using lenses and compare the function of the human eye to that of a camera lens.

### **Grade 8, Cluster 3: Fluids**

In this cluster, students investigate the properties of fluids, including viscosity, density, and compressibility. Students identify products in which viscosity is an important characteristic, and plan and conduct experiments to determine factors that affect flow. Students illustrate effects of temperature on density, and they compare the effects of fluids with different densities on the buoyant force of an object. They use the particle theory of matter to explain the relationships among pressure, volume, and temperature. Investigations of the relative compressibility of fluids are related to the ability of liquids and gases to transmit forces in hydraulic and pneumatic devices. Students apply their understanding of fluids within a practical context through the design, construction, and testing of a prototype that utilizes a hydraulic or pneumatic system.

### **Grade 8, Cluster 4: Water Systems**

In this cluster, students investigate the properties of water, its global manifestations, and its impacts. They compare and contrast fresh and salt water, describe factors that affect ocean currents, and recognize the impact of large

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bodies of water and ocean currents on regional climates. Features of the North American drainage system are identified, and factors that influence erosion and deposition in streams and large bodies of water examined. Students determine causes of flooding and examine methods and technologies used to contain or prevent damage from erosion and floods. Sources of drinking water are identified, methods for treating water are discussed, and waste-water disposal systems are compared. Students explore water pollution problems and identify environmental, social, and economic factors important to the management of water resources.

### **Senior 1, Cluster 0: Overall Skills and Attitudes**

Cluster 0 comprises nine categories of specific student learning outcomes that describe the skills and attitudes involved in scientific inquiry and the decision-making process for STSE issues\*.

In Grades 5 to 8, students develop scientific inquiry through the development of an hypothesis/ prediction, the identification and treatment of variables, and the formation of conclusions. Students begin to make decisions based on scientific facts and refine their decision-making skills as they progress through the grades, gradually becoming more independent. Students also acquire key attitudes, an initial awareness of the nature of science, and other skills related to research, communication, the use of information technology, and cooperative learning.

In Senior 1, students continue to use scientific inquiry as an important process in their science learning, but also recognize that STSE issues require a more sophisticated treatment through the decision-making process. This process has been delineated in the Cluster 0 specific learning outcomes.

Teachers should select appropriate contexts to introduce and reinforce scientific inquiry, the decision-making process, and positive attitudes within the thematic clusters (Clusters 1 to 4) over the course of the school year. For example, students will use the decision-making process as they examine a current biotechnology issue in Cluster 1. To assist in planning and to facilitate curricular integration, many specific learning outcomes within this cluster are accompanied by links to specific learning outcomes in other subject areas, specifically English language arts (ELA) and mathematics (Math). There are also links to Technology As a Foundation Skill Area (TFS).

### **Senior 1, Cluster 1: Reproduction**

Reproduction is an essential biological mechanism for the continuity and diversity of species. Students compare sexual and asexual methods of reproduction in this cluster. They learn how the human reproductive system functions and describe the major stages of human development from conception to birth. Students recognize that the nucleus of a cell contains genetic information and is responsible for the transmission of traits from one generation to the next. They also discuss factors that may change a cell's genetic information, including

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\* STSE stands for Science, Technology, Society, and Environment.

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environmental factors. Using the knowledge they have gained, students also address a current biotechnology issue.

### **Senior 1, Cluster 2: Atoms and Elements**

This cluster builds on the particle theory of matter learned in previous grades. Students become familiar with the basic constituents of matter by learning about the historical development of the atomic model and the periodic table. Various investigations of the properties of elements and compounds will acquaint students with chemical symbols and families, as well as with natural phenomena and everyday technologies that demonstrate chemical change.

### **Senior 1, Cluster 3: Nature of Electricity**

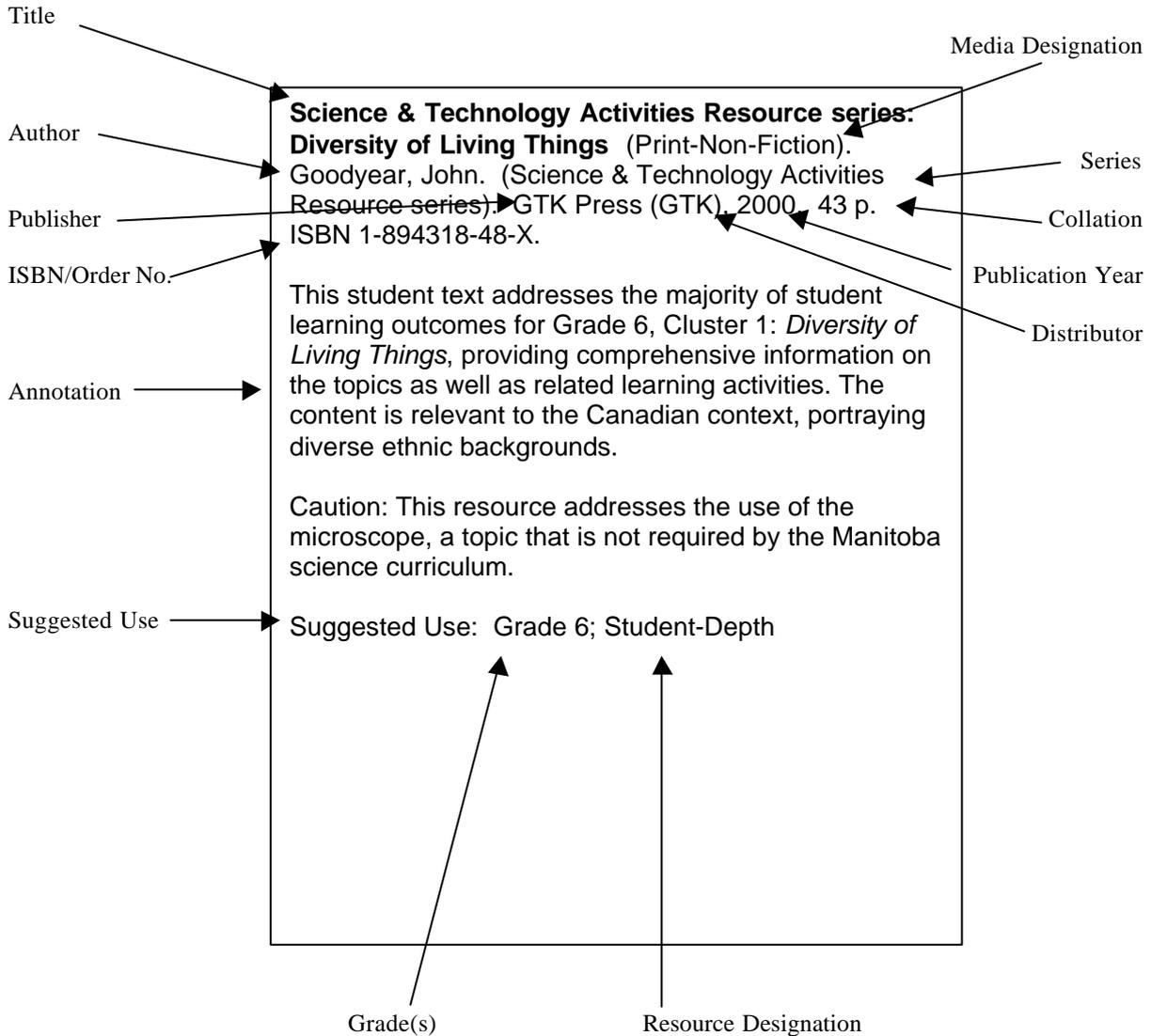
The conceptual development of the particle model of electricity underlies an understanding of electrostatics and current electricity. To develop and test this model, students construct simple devices like an electrophorus and investigate electrostatic phenomena. A transition from static to current electricity enables the learner to investigate circuits and make connections to daily applications like the cost of electrical energy and the safety and efficiency of electrical appliances. Additionally, students investigate hydroelectric power and address sustainability issues associated with the generation and transmission of electricity in Manitoba.

### **Senior 1, Cluster 4: Exploring the Universe**

This cluster leads students through an exploration of the universe starting with some basic hands-on astronomy and ending with a critical look at issues surrounding space science and technology. Students observe and locate visible celestial objects. This knowledge provides them with an appreciation for the relevance of astronomy to various peoples. Students develop an understanding of the origin, evolution, and components of the universe. They concurrently research and study Canada's involvement in international space exploration and evaluate the impact of space science and technologies in terms of their benefits and risks to the human race.

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## Resource Description: Sample Page



**Note:** Definitions of resource descriptions appear on the following page.

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## Resource Description: Definitions

The following information is provided for each learning and teaching resource (as applicable):

- **Annotation:** provides an overall description of the resource. Brief annotations of individual components and/or groups of components of the integrated resources are also provided.
- **Author(s):** refers to the author(s), editor(s), or director(s) of the resource. When a resource has more than three authors/editors only the first name is cited, followed by “et al.”
- **Cautions:** alert teachers to potentially sensitive curriculum fit issues or possible community concerns relating to the resource.
- **Collation:** specifies the number of pages of the resource.
- **Distributor:** is abbreviated in parentheses following the publisher or producer. The full names, addresses, fax numbers, and telephone numbers of these companies are given in the Distributor Directory.
- **Media Designation:** refers to resource categories such as non-fiction, kit, integrated resource, book collection, anthology, software, video, or audio.
- **Suggested Use:** indicates the grade(s) for which the resource is most suitable and identifies the resource designation. *Resource designation* refers to the classifications of student breadth, depth, or breadth and depth, and/or teacher reference. The resource designation for an integrated resource and book collection applies to the resource as a whole. Please note, for example, that an integrated resource may be designated as student depth and breadth and as teacher reference. This indicates that the audience for the resource is students, but the resource also includes teacher support materials. Book collections and student anthologies also include teacher support materials.
- **System Requirements:** specifies the system requirements needed to operate the software resource successfully. Abbreviations used: MB—megabyte; RAM—random-access memory.
- **Title:** refers to the name of the resource. All titles are listed in alphabetical order. Titles of individual components within the integrated resources are also provided.

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# **OBTAINING LEARNING RESOURCES**

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## **Purchase of Learning Resources**

The learning resources described in this annotated bibliography will be listed with ordering information and prices in the *Manitoba Text Book Bureau Catalogue of Learning Resources*. For information or assistance regarding the purchase of learning resources listed in this catalogue, please contact:

### **The Manitoba Text Book Bureau (MTBB)**

Box 910

Souris, MB R0K 2C0

Toll free: 800-305-5515 (in Manitoba)

Telephone: 204-483-4040 (outside Manitoba)

Fax: 204-483-3441

Email: [schoolorde@gov.mb.ca](mailto:schoolorde@gov.mb.ca)

Online catalogue: <http://www.mtbb.mb.ca>

## **Loans and Bookings of Learning Resources**

The learning resources listed in this annotated bibliography are available to Manitoba educators from:

### **Instructional Resources Unit (IRU)**

#### **Library**

Manitoba Education, Training and Youth

1181 Portage Avenue

Winnipeg, MB R3G 0T3

Online catalogue: <http://libcat.merlin.mb.ca>

Educators who are registered with IRU may request learning resources from the library in person, by telephone, by mail, by facsimile transmission, or by electronic mail.

To register with the library, contact:

#### **Circulation Desk, IRU** (see address above)

Telephone: 204-945-5371 (in Winnipeg)

Toll free: 800-282-8069, ext. 5371 (outside Winnipeg)

Fax: 204-945-8756

Email: [irucirc@gov.mb.ca](mailto:irucirc@gov.mb.ca)

To borrow books, multimedia kits, and audio CDs, contact:

#### **Reference Desk, IRU** (see address above)

Telephone: 204-945-7830/7851 (in Winnipeg)

Toll free: 800-282-8069, ext. 7830/7851 (outside Winnipeg)

Fax: 204-945-8756

Email: [iruref@gov.mb.ca](mailto:iruref@gov.mb.ca)

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To request videocassettes, videodiscs, CD-ROMs, and selected kits, contact:

**Media Booking, IRU** (see address above)  
Telephone: 204-945-7849 (in Winnipeg)  
Toll free: 800-592-7330 (outside Winnipeg)  
Fax: 204-945-8756  
Email: [irucirc@gov.mb.ca](mailto:irucirc@gov.mb.ca)

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## Titles and Descriptions

**Addison Wesley Science & Technology series** (Print-Integrated Resource). Harcourt, Lalie. (Addison Wesley Science & Technology series). Pearson Education Canada (PRN), 2000.

The Addison-Wesley Science and Technology resources recommended for use in Manitoba include the following **previously recommended** components:

- *Plant Growth* - Student Text and Teacher's Guide (Grade 3)
- *Soil* - Student Text and Teacher's Guide (Grade 3)
- *Addison-Wesley Science and Technology Program Overview: Grades 3-6*
- *Habitats* - Student Text and Teacher's Guide (Grade 4)
- *Light* - Student Text and Teacher's Guide (Grade 4)
- *Sound* - Student Text and Teacher's Guide (Grade 4)
- *Rocks and Minerals* - Student Text and Teacher's Guide (Grade 4)
- *Changes in Matter* - Student Text and Teacher's Guide (Grade 5)
- *Weather* - Student Text and Teacher's Guide (Grade 5)
- *Space* - Student Text and Teacher's Guide (Grade 6)
- *Addison-Wesley Science and Technology 7* (student text comprised of all modules)
- *Ecosystems* - Student Text and Teacher's Guide (Grade 7)
- *Heat* - Student Text and Teacher's Guide (Grade 7)
- *Mixtures* - Student Text and Teacher's Guide (Grade 7)
- *The Earth's Crust* - Student Text and Teacher's Guide (Grade 7)
- *Optics* - Student Text and Teacher's Guide (Grade 8)
- *Addison Wesley Science & Technology Program Overview: Grades 7-8*

The following **new components** have now been recommended:

- *All About Animals* - Student Text (Grade 2)
- *In the Kitchen* - Student Text (Grade 2)
- *Mechanics at Work* - Student Text (Grade 2)
- *Weather Watch* - Student Text (Grade 2)
- *Science and Technology Teacher's Guide* (Grade 2)
- *Science and Technology Flip Chart Book* (Grade 2)

The lessons contained in the student texts help students define a task, problem, or activity that they will engage in to address the content presented. They also provide students with an opportunity to obtain expository information from print materials. The teacher's guide must be used in conjunction with the student texts to comprehensively address the student learning outcomes for each cluster. The Flip Chart book provides an alternative to the student text. The teacher's guide provides guidance to support activity based learning experiences that promote respectful and positive attitudes towards the environment.

**Addison Wesley Science & Technology series: All About Animals** (Print-Non-Fiction). Harcourt, Lalie. (Addison Wesley Science & Technology series). Pearson Education Canada (PRN), 2000. 16 p. ISBN 0-13-088971-7.

This student text, when used in conjunction with the teacher's guide, addresses specific learning outcomes from Grade 2, Cluster 1: *Growth and Changes in Animals*. This resource addresses outcomes related to animals in a comprehensive manner, but does not address human nutritional student learning outcomes. Extensive text blocks on some pages, size of font, and challenging vocabulary may not be suited to the range of student abilities within a grade.

Suggested Use: Grade 2; Student-Depth

**Addison Wesley Science & Technology series: In the Kitchen** (Print-Non-Fiction). Harcourt, Lalie. (Addison Wesley Science & Technology series). Pearson Education Canada (PRN), 2000. 16 p. ISBN 0-13-019763-7.

This student text, when used in conjunction with the teacher's guide, addresses specific learning

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outcomes from Grade 2, Cluster 2: *Properties of Solids, Liquids, and Gases*. Topics including properties of gases and methods to safely dispose of solids and liquids are not addressed. Extensive text blocks on some pages, size of font, and challenging vocabulary may not be suited to the range of student abilities within a grade.

Suggested Use: Grade 2; Student-Depth

**Addison Wesley Science & Technology series:**

**Mechanics at Work** (Print-Non-Fiction).

Harcourt, Lalie. (Addison Wesley Science & Technology series). Pearson Education Canada (PRN), 2000. 16 p. ISBN 0-13-019750-5.

This student text, when used in conjunction with the teacher's guide, addresses specific learning outcomes from Grade 2, Cluster 3: *Position and Motion*. Extensive text blocks on some pages, size of font, and challenging vocabulary may not be suited to the range of student abilities within a grade.

Suggested Use: Grade 2; Student-Depth

**Addison Wesley Science & Technology series: Science & Technology Flip Chart Book Grade 2.**

(Print-Non-Fiction). Harcourt, Lalie. (Addison Wesley Science & Technology series). Pearson Education Canada (PRN), 2000. 14 p. ISBN 0-13-089751-5.

This resource provides the information from each student text in chart form, allowing students to follow along in their books. This resource contains an additional unit, "On the Move", that is not part of Manitoba's science curriculum.

Suggested Use: Grade 2; Student-Depth

**Addison Wesley Science & Technology series: Science & Technology Teacher's Guide Grade 2**

(Print-Non-Fiction). Harcourt, Lalie. (Addison Wesley Science & Technology series). Pearson Education Canada (PRN), 2000. 120 p. ISBN 0-13-027911-0.

Each unit contains an overview, suggestions for activating strategies to launch the unit, an activity bank, and a cross-curricular overview. Time

frames for lessons are included. Suggestions are provided for ongoing assessment and include rubrics, teacher observations, portfolio entries, interviews, checklists and student self-assessments. Also, there are lists of supplementary teacher resources, books for children, cross-referencing to student text, blackline masters, and materials lists. This resource includes reference to an additional unit, "On the Move", that is not part of Manitoba's science curriculum.

Suggested Use: Grade 2; Teacher Reference

**Addison Wesley Science & Technology series:**

**Weather Watch** (Print-Non-Fiction).

Harcourt, Lalie. (Addison Wesley Science & Technology series). Pearson Education Canada (PRN), 2000. 16 p. ISBN 0-13-027909-9.

This student text, when used in conjunction with the teacher's guide, addresses the majority of specific learning outcomes from Grade 2, Cluster 4: *Air and Water in the Environment*. Extensive text blocks on some pages, size of font, and challenging vocabulary may not be suited to the range of student abilities within a grade.

Suggested Use: Grade 2; Student-Depth

**EarthStation Library™ series** (Print-Integrated Resource). (EarthStation Library™). EOA Scientific Systems, Inc. (EOA), 2000.

The *EarthStation Library™* is a curriculum-based collection of earth/space science educational software blending science and technology to enrich science classes. The following resources are recommended for use in Manitoba:

- *Geology Explorer™* (Grade 7)
- *Oceans-Climate Explorer™* (Grade 8)
- *Astronomy Explorer™* (Senior 1)

These resources address concepts through text, photographs, video clips, and learning activities. It is easy to locate specific topics using the topics and sub-topics in the contents section. Easily accessible pop-up windows provide more in-depth information. A common set of appendices

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is included in each software piece, addressing the scientific method and measurement systems and SI. These are supplemented by topic-specific resources in each software piece. A glossary is included. The ease of navigation makes these resources student-friendly and include tracking tools such as bookmarks and a recorded history allowing students to keep track of where they've been. Each CD-ROM includes a teacher's manual (Adobe Acrobat is required to access it).

**EarthStation Library™: Astronomy Explorer** (CD-ROM). (EarthStation Library™). EOA Scientific Systems, Inc. (EOA), 2000. ISBN 1-55241176-1.

This resource supports Senior 1, Cluster 4: *Exploring the Universe*. It includes detailed information about each planet in the solar system. Topics related to the use and impact of space technologies, as well as Canada's participation in space research are not included.

This resource also supports components of Grade 6, Cluster 4: *Exploring the Solar System*, specifically details regarding each planet in the solar system.

Suggested Use: Grade 6; Grade 10; Student-Depth; Teacher Reference

**EarthStation Library™: Geology Explorer**. (CD-ROM). (EarthStation Library™). EOA Scientific Systems, Inc. (EOA), 2000. ISBN 1-55241-174-5.

This resource addresses all the specific learning outcomes for Grade 7, Cluster 4: *Earth's Crust* and strongly supports learning outcomes related to the scientific inquiry component of Cluster 0: *Overall Skills and Attitudes*.

Suggested Use: Grade 7; Student-Depth; Teacher Reference

**EarthStation Library™: Oceans-Climate Explorer** (CD-ROM). (EarthStation Library™). EOA Scientific Systems, Inc. (EOA), 2000. ISBN 1-55241-178-8.

This resource addresses the majority of specific learning outcomes for Grade 8, Cluster 4: *Water*

*Systems*. Additional information related to climate goes beyond curricular expectations for this grade.

Suggested Use: Grade 8; Student-Depth; Teacher Reference

**Experimenting with Light and Colour**. (Print-Non-Fiction). Gore, Gordon R. Trifolium Books Inc. (GDS), 2000. 42 p. ISBN 1-55244-036-2.

This student text addresses the majority of specific learning outcomes for Grade 8, Cluster 2: *Optics*. The resource is well organized, with clear headings, black and white photographs, and cartoon drawings contributing to the visual presentation. Important safety information is highlighted and connections are made to everyday life. The limited vocabulary and amount of text per page makes this resource suited to a wide range of student abilities. An index is included.

Suggested Use: Grade 8; Student-Depth

**Experimenting with Light and Colour: Teacher's Guide to accompany Experimenting With Light and Colour** (Print-Non-Fiction). Gore, Gordon R. Trifolium Books Inc. (GDS), 2000. 12 p. ISBN 1-55244-019-2.

This teacher resource supports student development of scientific literacy through a hands-on approach using authentic investigations. Clear cross-references are included, providing effective support to the student text. End-of-unit assessment tools are provided, including self-assessment tools.

Suggested Use: Grade 8; Teacher Reference

**Hands-on Science series** (Print-Integrated Resource). Lawson, Jennifer E. (Hands-on Science series). Peguis Publishers Limited (PEG), 2000.

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The *Hands-On Science* resources recommended for use in Manitoba consist of the following **previously recommended** components:

- *Hands-On Science Level 1* (Grade 1)
- *Hands-On Science Level 2* (Grade 2)
- *Hands-On Science Level 3* (Grade 3)
- *Hands-On Science Level 4* (Grade 4)

Two **new components** have now been recommended:

- *Hands-On Science Level 5* (Grade 5)
- *Hands-On Science Level 6* (Grade 6)

This series provides support for teaching science in a manner that promotes active learning and experimentation. Each level included in the series corresponds to a specific grade (Grades 1 to 6), and the units within each level correspond to the thematic clusters for the Manitoba science curriculum. Each topic is well organized and includes science background information for teachers, as well as materials lists, suggested learning experiences, activity sheets, extensions, and assessment tools for both teacher and student use.

Manitoba's specific student learning outcomes for science are not explicitly cross-referenced and the content needs to be supplemented to achieve the depth of coverage required for some topics.

**Hands-on Science series: Hands-on Science. Level Five.** (Print-Non-Fiction). Lawson, Jennifer E. (*Hands-on Science* series). Peguis Publishers Limited (PEG), 2000. 304 p. ISBN 1-894110-56-0.

This user-friendly resource has a strong match with specific learning outcomes from the four thematic clusters in Grade 5 (Cluster 1: *Maintaining a Healthy Body*, Cluster 2: *Properties of and Changes in Substances*, Cluster 3: *Forces and Simple Machines*, and Cluster 4: *Weather*), as well as with Cluster 0: *Overall Skills and Attitudes*.

Caution: This resource addresses the study of cells using the microscope, a topic not required by the Manitoba science curriculum.

Suggested Use: Grade 5; Teacher Reference

**Hands-on Science series: Hands-on Science. Level Six** (Print-Non-Fiction). Lawson, Jennifer E. (*Hands-on Science* series). Peguis Publishers Limited (PEG), 2000. 327 p. ISBN 1-894110-60-9.

This user-friendly resource has a strong match with specific learning outcomes from the four thematic clusters in Grade 6 (Cluster 1: *Diversity of Living Things*, Cluster 2: *Flight*, Cluster 3: *Electricity*, and Cluster 4: *Exploring the Solar System*), as well as with Cluster 0: *Overall Skills and Attitudes*.

Suggested Use: Grade 6; Teacher Reference

**Inventeering: A Problem Solving Approach To Teaching Technology** (Print-Non-Fiction). Corney, Bob. Trifolium Books Inc. (GDS), 2001. 133 p. ISBN 1-55244-014-1.

This teacher resource supports the design process component of Cluster 0: *Overall Skills and Attitudes* for Grades 5 to 8. It includes sections devoted to an overview of the design process, organizing the science classroom, assessing student learning, and cluster-specific investigations. A chart is used to indicate which investigations fit with which grade and cluster. Although this information relates to the Ontario curriculum, it is a useful tool for Manitoba teachers as well.

The resource emphasizes problem solving and construction of devices to enhance learning of scientific principles. It provides teachers with guidance in selecting tools and methodologies for their science classrooms.

Suggested Use: Grade 5; Grade 6; Grade 7; Grade 8; Teacher Reference

**Nelson Science & Technology series** (Print-Integrated Resource). (Nelson Science &

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Technology series). Nelson Thomson Learning (NEL), 2001.

The Nelson Science & Technology resources include the following **previously recommended** resources:

- *Nelson Science & Technology 7* (overall student text comprising all the material from the individual student units and the skills handbook)
- *Unit 1: Pure Substances and Mixtures* (student text, teacher's resource, transparencies package)
- *Unit 2: Heat* (student text, teacher's resource, transparencies package)
- *Unit 3: Structural Strength and Stability*
- *Unit 4: The Earth's Crust* (student text, teacher's resource, transparencies package)
- *Unit 5: Interactions Within Ecosystems* (student text, teacher's resource, transparencies package)
- *Nelson Science & Technology 8* (overall student text comprising all the material from the individual student units and the skills handbook)
- *Unit 1: Cells, Tissues, Organs and Systems* (student text, teacher's resource, transparencies package)
- *Unit 2: Fluids* (student text, teacher's resource, transparencies package)
- *Unit 4: Water Systems* (student text, teacher's resource, transparencies package)
- *Unit 5: Optics* (student text, teacher's resource, transparencies package)
- *Nelson Science & Technology Skills Handbook*

The following **new resources** have been recommended:

- *Nelson Science & Technology: Computerized Assessment Bank 7*
- *Nelson Science & Technology: Computerized Assessment Bank 8*

Taken altogether, this series addresses the majority of the specific learning outcomes for all clusters in the Grades 7 and 8 science curriculum in a comprehensive manner.

**Nelson Science & Technology series: Nelson Science & Technology 7. Computerized**

**Assessment Bank.** (CD-ROM). (Nelson Science & Technology series). Nelson Thomson Learning (NEL), 2000. ISBN 0-17-612059-9.

This assessment tool allows teachers to choose questions from a question bank to create their own tests, or to generate tests using a random selection of questions. Each unit lists curriculum outcomes (Ontario) and allows users to choose test questions that correlate with the outcomes. A main menu, unit headings, and help access make these tools user-friendly. The assessment banks can be used in conjunction with the previously recommended student texts or as stand-alone assessment tools.

Suggested Use: Grade 7; Student-Breadth & Depth; Teacher Reference

**Nelson Science & Technology series: Nelson Science & Technology 8. Computerized Assessment Bank.** (CD-ROM). (Nelson Science & Technology series). Nelson Thomson Learning (NEL), 2001. ISBN 0-17-607497-4.

This assessment tool allows teachers to choose questions from a question bank to create their own tests, or to generate tests using a random selection of questions. Each unit lists curriculum outcomes (Ontario) and allows users to choose test questions that correlate with the outcomes. A main menu, unit headings, and help access make these tools user-friendly. The assessment banks can be used in conjunction with the previously recommended student texts or as stand-alone assessment tools.

Suggested Use: Grade 8; Student-Breadth & Depth; Teacher Reference

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**Nelson Science series** (Print-Integrated Resource). (Nelson Science series). Nelson Thomson Learning (NEL), 2000.

The Nelson Science 9 resources recommended for use in Manitoba include the following previously recommended components:

- *Nelson Science 9* (Student Text, Teacher's Resource, Transparencies)

The following new component has now been recommended:

- *Nelson Science 9. Computerized Assessment Bank*

This collection of resources address the majority of specific learning outcomes for all clusters in the Senior 1 science curriculum.

**Nelson Science series: Nelson Science & Technology 9. Computerized Assessment Bank.** (CD-ROM). (Nelson Science series). Nelson Thomson Learning (NEL), 2000. ISBN 0-17-612063-7.

This assessment tool allows teachers to choose questions from a question bank to create their own tests, or to generate tests using a random selection of questions. Each unit lists curriculum outcomes (Ontario) and allows users to choose test questions that correlate with the outcomes. A main menu, unit headings, and help access make these tools user-friendly. The assessment banks can be used in conjunction with the previously recommended student texts or as stand-alone assessment tools.

Suggested Use: Grade 9; Student-Breadth & Depth; Teacher Reference

**Pan Canadian Science Place series** (Print-Integrated Resource). Graham, Wendy, ed. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000.

The Pan Canadian Science Place resources recommended for use in Manitoba include the following **previously recommended** resources:

- *Air and Water* - Student Text and Teacher's Guide (Grade 2)
- *Animals Grow* - Student Text and Teacher's Guide (Grade 2)
- *Matter, Matter Everywhere* - Student Text and Teacher's Guide (Grade 2)
- *Move It!* - Student Text and Teacher's Guide (Grade 2)
- *Build It Up!* - Student Text and Teacher's Guide (Grade 3)
- *Down Under* - Student Text and Teacher's Guide (Grade 3)
- *Invisible Power* - Student Text and Teacher's Guide (Grade 3)
- *Watch It Grow!* - Student Text and Teacher's Guide (Grade 3)
- *Healthy Habitats* - Student Text and Teacher's Guide (Grade 4)
- *Rockhound* - Student Text and Teacher's Guide (Grade 4)
- *Sounds Good* - Student Text and Teacher's Guide (Grade 4)
- *Body Works* - Student Text and Teacher's Guide (Grade 5)
- *Weatherwise* - Student Text and Teacher's Guide (Grade 5)
- *Variety of Life* - Student Text and Teacher's Guide (Grade 6)

The following **new resources** have now been recommended:

- *It's Alive* - Student Text and Teacher's Guide (Grade 1)
- *Characteristics and Needs of Living Things* - Student Text and Teacher's Guide (Grade 1)
- *What's It Like* - Student Text and Teacher's Guide (Grade 1)
- *Earth Watch* - Student Text and Teacher's Guide (Grade 1)
- *Design Team* - Student Text and Teacher's Guide (Grade 1)
- *Putting It in Motion* - Student Text and Teacher's Guide (Grade 5)
- *What's the Matter?* - Student Text and Teacher's Guide (Grade 5)
- *Out of This World* - Student Text and Teacher's Guide (Grade 6)
- *Program and Assessment Guide: Grades 1-3*
- *Program and Assessment Guide: Grades 4-6*

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*Student Texts:* Each student text is divided into lessons that combine information with clearly described explorations. The concluding design project effectively synthesizes the curricular outcomes and reinforces student learning. The appealing colour illustrations, photographs, diagrams, and accessible readability level make these resources appropriate for students with a wide range of learning approaches and abilities. Safety tips are included.

*Teacher's Guides:* Each teacher's guide provides background science information and supplementary learning experiences to enhance the material in the corresponding student text, as well as cross-references to the Manitoba science curriculum. A section on common student misconceptions is provided at the beginning of each lesson. Links to English language arts, mathematics, and social studies are clearly identified, along with suggestions to extend student learning. The teacher's guides include blackline masters of student learning activities and assessment, as well as an overall correlation chart summarizing the specific learning outcomes addressed in each lesson. There is no index.

**Pan Canadian Science Place series: Design Team** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 16 p. ISBN 1-55268-894-1.

This student text, when used in conjunction with the teacher's guide, addresses specific learning outcomes from Grade 1, Cluster 0: *Overall Skills and Attitudes*. This resource provides a comprehensive skills focus.

Suggested Use: Grade 1; Student-Depth

**Pan Canadian Science Place series: Design Team Teacher's Guide - Manitoba Edition** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 58 p. ISBN 1-55268-883-6.

This teacher's guide includes references to Manitoba's science outcomes as part of each lesson outline.

Suggested Use: Grade 1; Teacher Reference

**Pan Canadian Science Place series: Earth Watch** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 16 p. ISBN 1-55268-897-6.

This student resource, when used in conjunction with the teacher's guide, addresses the majority of student learning outcomes from Grade 1, Cluster 4: *Daily and Seasonal Changes*.

Suggested Use: Grade 1; Student-Depth

**Pan Canadian Science Place series: Earth Watch Teacher's Guide - Manitoba Edition**. (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 63 p. ISBN 1-55268-892-5.

This teacher's guide includes references to Manitoba's science outcomes as part of each lesson outline.

Suggested Use: Grade 1; Teacher Reference

**Pan Canadian Science Place series: It's Alive!** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 16 p. ISBN 1-55268-893-3.

This student text, when used in conjunction with the teacher's guide, addresses the majority of specific learning outcomes from Grade 1, Cluster 1: *Characteristics and Needs of Living Things*. A good variety of humans, plants, and animals are portrayed through colourful photos and drawings. There is some extra information included that is not part of Manitoba's science curriculum.

Suggested Use: Grade 1; Student-Depth

**Pan Canadian Science Place series: It's Alive! Teacher's Guide - Manitoba Edition** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 75 p. ISBN 1-55268-880-1.

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This teacher's guide includes references to Manitoba's science outcomes as part of each lesson outline.

Suggested Use: Grade 1; Teacher Reference

**Pan Canadian Science Place series: Out of This World.** (Print-Non-Fiction). Science Place Team. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 56 p. ISBN 0-7791-0089-1.

This student resource addresses the majority of specific learning outcomes from Grade 6, Cluster 4: *Exploring the Solar System*. Information related to Canadian contributions to space science, including technological innovations, as well as contributions by other cultures is found only in the accompanying teacher's guide and is limited.

Suggested Use: Grade 6; Student-Depth

**Pan Canadian Science Place series: Out of This World. Teacher's Guide - Manitoba Edition** (Print-Non-Fiction). Science Place Team. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 112 p. ISBN 0-7791-0084-0.

This teacher resource contains some outcome-related information that is not found in the student text, specifically, information addressing the contributions of Canadians to the understanding and exploration of space. The *Program and Assessment Guide* should be used in conjunction with the teacher's guide.

Suggested Use: Grade 6; Teacher Reference

**Pan Canadian Science Place series: Pan Canadian Science Place Program and Assessment Guide Grades 1-3** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 128 p. ISBN 0-7791-0091-3.

This resource supplements the information contained within the individual teachers' guides. It helps teachers in encouraging children to develop a curiosity and respect for the natural world, constructing an understanding of scientific

concepts and acquiring and practising skills of inquiry and communication. It addresses important topics such as teaching science, assessment and evaluation, teaching aids (software, Websites, print resources), classroom management, and teaching combined grades. Blackline masters containing informative visuals to enhance awareness of scientific skills and processes and student work samples are also included. The *Program and Assessment Guide* supplements the teacher's guides at grades 1 to 3, or can be used as a stand-alone resource.

Suggested Use: Grade 1; Teacher Reference

**Pan Canadian Science Place series: Program and Assessment Guide. Grades 4-6.** (Print-Non-Fiction). Science Place Team. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 104 p. ISBN 0-7791-0093-X.

This resource supplements the information contained within the individual teachers' guides. It helps teachers in encouraging children to develop a curiosity and respect for the natural world, constructing an understanding of scientific concepts and acquiring and practising skills of inquiry and communication. It addresses important topics such as teaching science, assessment and evaluation, teaching aids (software, Websites, print resources), classroom management, and teaching combined grades. Blackline masters containing informative visuals to enhance awareness of scientific skills and processes and student work samples are also included. The *Program and Assessment Guide* supplements the teacher's guides at grades 4 to 6, or can be used as a stand-alone resource.

Suggested Use: Grade 6; Teacher Reference

**Pan Canadian Science Place series: Putting It In Motion.** (Print-Non-Fiction). Science Place Team. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 64 p. ISBN 0-7791-0088-3.

This student text addresses the majority of specific learning outcomes from Grade 5, Cluster 3: *Forces and Simple Machines*. Important Science, Technology, Society and the Environment (STSE) connections are made

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through technology- and environment-related discussions.

Caution: The first portion of this resource includes topics not part of Manitoba's science curriculum, specifically related to motion energy (kinetic and potential).

Suggested Use: Grade 5; Student-Depth

**Pan Canadian Science Place series: Putting It In Motion Teacher's Guide - Manitoba Edition.** (Print-Non-Fiction). Science Place Team. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 109 p. ISBN 0-7791-0081-6.

The *Program and Assessment Guide* should be used in conjunction with the teacher's guide.

Suggested Use: Grade 5; Teacher Reference

**Pan Canadian Science Place series: What's It Like?** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 16 p. ISBN 1-55268-896-8.

This student text, when used in conjunction with the teacher's guide, addresses the majority of specific learning outcomes from Grade 1, Cluster 2: *The Senses*, and Grade 1, Cluster 3: *Characteristics of Objects and Materials*. This resource provides strong connections between the two clusters, and incorporates real-life objects that students can relate to, to support their learning.

Suggested Use: Grade 1; Student-Depth

**Pan Canadian Science Place series: What's It Like? Teacher's Guide - Manitoba Edition.** (Print-Non-Fiction). Graham, Wendy. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 79 p. ISBN 1-55268-889-5.

This teacher's guide includes references to Manitoba's science outcomes as part of each lesson outline.

Suggested Use: Grade 1; Teacher Reference

**Pan Canadian Science Place series: What's the Matter.** (Print-Non-Fiction). Science Place Team. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 48 p. ISBN 0-7791-0066-2.

This student text addresses the majority of specific learning outcomes from Grade 5, Cluster 2: *Properties of and Changes in Substances*. Special topics include a historical perspective and a discussion related to environmental issues.

Suggested Use: Grade 5; Student-Depth

**Pan Canadian Science Place series: What's the Matter Teacher's Guide - Manitoba Edition.** (Print-Non-Fiction). Science Place Team. (Pan Canadian Science Place series). Scholastic Canada Ltd. (MTB), 2000. 107 p. ISBN 0-7791-0055-7.

The *Program and Assessment Guide* should be used in conjunction with the teacher's guide.

Suggested Use: Grade 5; Teacher Reference

**Sci-Tech Connections series** (Print-Integrated Resource). Moore, Nancy. (Sci-Tech Connections 3 series). Curriculum Plus (CPLUS), 2001.

The *Sci-Tech Connections* resources recommended for use in Manitoba consist of the following modules:

- *The Twins Get All Charged Up* (Grade 3)
- *Light, Sound, Action* (Grade 4)
- *A Visit to a Castle* (Grade 5)
- *The Solution Is...* (Grade 7)
- *Structural Interactions* (Grade 7)
- *Liquids and Gas...I Now Pronounce You Fluids* (Grade 8)
- *Brainline Masters Resource, 1-3*
- *Brainline Masters Resource, 4-8*

These resources spark student thinking through stories/scenarios that generate student questions and provide a purpose and context for hands-on

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investigations. Each resource can be used in different ways to support a wide range of student abilities, including options for different ways that students can present their thinking and learning. Guiding questions are provided for teachers to use with students to facilitate their thinking and skill development in observing, interacting, inquiry, and design. The resources also provide student background information, suggest related reading, make cross-curricular connections, and include comprehensive materials lists. Blackline masters for use in assessment are available in the *Brainline Masters Resource, 4–8*.

Teachers with a strong science background who wish to implement cross-curricular programming will find this a valuable resource.

*Note:* Other *Sci-Tech Connections* modules are under development and have not been reviewed.

**Sci-Tech Connections 3 series: Brainline Masters Resource 1-3** (Print-Non-Fiction). Moore, Nancy. (Sci-Tech Connections 3 series). Curriculum Plus (CPLUS), 2001. 29 p. ISBN 1-55348-035-X.

This resource contains blackline masters (BLMs) which can be used as stand-alone resources or as comprehensive support for the Sci-Tech resources recommended for Grade 3. Scientific inquiry and design process skill development are emphasized, as well as other areas, such as group work and research. The resource begins with information for teachers on how to use this resource, including a description of each BLM. The BLMs provide graphic organizers to guide students through the design and scientific inquiry processes, including planning and recording sheets, with guiding questions that allow students to synthesize, apply, and extend their learning. A wide range of assessment tools are provided, including rubrics, rating scales, and checklists for both teacher and student use in self-assessment and group assessment.

Suggested Use: Grade 3; Teacher Reference

**Sci-Tech Connections 3 series: The Twins Get all Charged Up** (Print-Non-Fiction). Moore, Nancy. (Sci-Tech Connections series). Curriculum Plus (CPLUS), 2001. 55 p. ISBN

1-55348-015-5.

This module addresses the majority of specific learning outcomes for the Grade 3, Cluster 3: *Forces That Attract or Repel*, as well as Cluster 0: *Overall Skills and Attitudes*.

Suggested Use: Grade 3; Teacher Reference

**Sci-Tech Connections 4 series: A Visit to a Castle** (Print-Non-Fiction). Moore, Nancy. (Sci-Tech Connections 4 series). Curriculum Plus (CPLUS), 2001. 59 p. ISBN 1-55348-020-1.

This module addresses the majority of specific learning outcomes for Grade 5, Cluster 3: *Forces and Simple Machines*.

Suggested Use: Grade 4; Teacher Reference

**Sci-Tech Connections 4 series: Brainline Masters Resource 4-8** (Print-Non-Fiction). Moore, Nancy. (Sci-Tech Connections 4 series). Curriculum Plus (CPLUS), 2001. 75 p. ISBN 1-55348-049-X.

This resource contains blackline masters (BLMs) which can be used as stand-alone resources or as comprehensive support for the Sci-Tech resources recommended for Grades 4 to 8. Scientific inquiry and design process skill development are emphasized, as well as other areas, such as group work and research. The resource begins with information for teachers on how to use this resource, including a description of each BLM. The BLMs provide graphic organizers to guide students through the design and scientific inquiry processes, including planning and recording sheets, with guiding questions that allow students to synthesize, apply, and extend their learning. A wide range of assessment tools are provided, including rubrics, rating scales, and checklists for both teacher and student use in self-assessment and group assessment.

Suggested Use: Grade 4; Teacher Reference

**Sci-Tech Connections 4 series: Light, Sound, Action** (Print-Non-Fiction). Moore, Nancy. (Sci-

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Tech Connections 4 series). Curriculum Plus (CPLUS), 2001. 75 p. ISBN 1-55348-021-X.

This module addresses specific learning outcomes for Grade 4, Cluster 2: *Light*, Grade 4 Cluster 3: *Sound*, as well as Cluster 0: *Overall Skills and Attitudes*.

Suggested Use: Grade 4; Teacher Reference

**Sci-Tech Connections 7 series: Structural Interactions Unit 7A** (Print-Non-Fiction). Hayhoe, Christy. (Sci-Tech Connections 7 series). Curriculum Plus (CPLUS), 2001. ISBN 1-55348-038-4.

This module addresses the majority of specific learning outcomes for Grade 7, Cluster 3: *Forces and Structures*, as well as Cluster 0: *Overall Skills and Attitudes*.

Suggested Use: Grade 7; Teacher Reference

**Sci-Tech Connections 7 series: The Solution Is... Unit 7B** (Print-Non-Fiction). Hayhoe, Christy. (Sci-Tech Connections 7 series). Curriculum Plus (CPLUS), 2001. ISBN 1-55348-039-2.

This module addresses the majority of specific learning outcomes for the Mixtures and Solutions portion of Grade 7, Cluster 2: *Particle Theory of Matter*, as well as Cluster 0: *Overall Skills and Attitudes*.

Suggested Use: Grade 7; Teacher Reference

**Sci-Tech Connections 8 series: Liquids and Gas... I Now Pronounce You Fluids Unit 8B** (Print-Non-Fiction). Sorenson, William A. (Sci-Tech Connections 8 series). Curriculum Plus (CPLUS), 2001. ISBN 1-55348-045-7.

This module addresses the majority of specific learning outcomes for Grade 8, Cluster 3: *Fluids*, as well as Cluster 0: *Overall Skills and Attitudes*.

Suggested Use: Grade 8; Teacher Reference

## Science & Technology Activities

**Resource series** (Print-Integrated Resource). Chiswell, Leslie. (Science & Technology Activities Resource series). GTK Press (GTK), 2000.

The *Science and Technology Activities Resource* components recommended for use in Manitoba consist of the following components:

- *Habitats and Communities* - Student Text and Teacher's Guide (Grade 4)
- *Rocks Minerals and Erosion* - Student Text and Teacher's Guide (Grade 4)
- *Human Organs* - Student Text and Teacher's Guide (Grade 5)
- *Diversity of Living Things* - Student Text and Teacher's Guide (Grade 6)

These resources promote hands-on learning experiences and authentic investigations.

*Student Texts:* The student texts are organized into lessons and sections, including "Did You Know" (interesting trivia to activate student learning), "Challenge" (statement of the goal of the learning experience), "Investigation" (includes extension opportunities), and "Tell Me More" (text reinforcing investigation). The resources make connections to everyday life and provide students with opportunities to learn about science careers and scientists. Cross-curricular links to physical education, health, mathematics, and English language arts are included. In terms of technical design, the layout, graphics, and paper quality are basic and plain.

*Teacher's Guides:* The teacher's guides contain clear cross-references to the student texts, adding to the usefulness of the resources. Assessment tools such as rubrics and self-assessment frames are provided, as well as suggestions for extension activities. Other features include suggestions for cross-curricular integration, background information of science concepts, safety tips, materials lists, and blackline masters of learning activities and assessment tools.

**Science & Technology Activities Resource series: Diversity of Living Things** (Print-Non-Fiction). Goodyear, John. (Science & Technology

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Activities Resource series). GTK Press (GTK), 2000. 43 p. ISBN 1-894318-48-X.

This student text addresses the majority of student learning outcomes for Grade 6, Cluster 1: *Diversity of Living Things*, providing comprehensive information on the topics as well as related learning activities. The content is relevant to the Canadian context, portraying diverse ethnic backgrounds.

Caution: This resource addresses the use of the microscope, a topic that is not required by the Manitoba science curriculum.

Suggested Use: Grade 6; Student-Depth

**Science & Technology Activities Resource series: Diversity of Living Things. Teacher's Guide** (Print-Non-Fiction). Goodyear, John. (Science & Technology Activities Resource series). GTK Press (GTK), 2000. 43 p. ISBN 1-894318-47-1.

This teacher's guide is cross-referenced to the student text *Diversity of Living Things*.

Suggested Use: Grade 6; Teacher Reference

**Science & Technology Activities Resource series: Habitats and Communities. Student Journal** (Print-Non-Fiction). Chiswell, Leslie. (Science & Technology Activities Resource series). GTK Press (GTK), 2000. 43 p. ISBN 1-894318-44-7.

This student text addresses the majority of student learning outcomes for Grade 4, Cluster 1: *Habitats and Communities*, providing comprehensive information on the topics as well as related learning activities. Each investigation contains a hands-on learning experience, many of which take place outdoors. The font size may discourage struggling readers.

Suggested Use: Grade 4; Student-Depth

**Science & Technology Activities Resource series: Habitats and Communities. Teacher's Guide** (Print-Non-Fiction). Chiswell, Leslie. (Science &

Technology Activities Resource series). GTK Press (GTK), 2000. 73 p. ISBN 1-894318-43-9.

This teacher's guide is cross-referenced to the student text *Habitats and Communities*. Simulation games are provided.

Suggested Use: Grade 4; Teacher Reference

**Science & Technology Activities Resource series: Life Systems: Human Organs.** (Print-Non-Fiction). Nilsson, Christer. (Science & Technology Activities Resource series). GTK Press (GTK), 2000. 44 p. ISBN 1-894318-46-3.

This student text addresses the majority of student learning outcomes for Grade 5, Cluster 1: *Maintaining a Healthy Body*, providing comprehensive information on the topics as well as related learning activities. The content is relevant to the Canadian context. It includes Aboriginal perspectives and portrays diverse ethnic backgrounds.

Suggested Use: Grade 5; Student-Depth

**Science & Technology Activities Resource series: Life Systems: Human Organs. Teacher's Guide.** (Print-Non-Fiction). Nilsson, Christer. (Science & Technology Activities Resource series). GTK Press (GTK), 2000. 66 p. ISBN 1-894318-45-5.

This teacher's guide is cross-referenced to the student text *Human Organs*.

Suggested Use: Grade 5; Teacher Reference

**Science & Technology Activities Resource series: Rocks, Minerals, and Erosion. Student Journal** (Print-Non-Fiction). Chiswell, Leslie. (Science & Technology Activities Resource series). GTK Press (GTK), 2000. 44 p. ISBN 1-894318-56-0.

This student text addresses the majority of student learning outcomes for Grade 4, Cluster 4: *Rocks, Minerals, and Erosion*. The font size may discourage struggling readers.

Suggested Use: Grade 4; Student-Depth

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**Science & Technology Activities Resource series: Rocks, Minerals, and Erosion. Teacher's Guide** (Print-Non-Fiction). Chiswell, Leslie. (Science & Technology Activities Resource series). GTK Press (GTK), 2000. 58 p. ISBN 1-894318-55-2.

This teacher's guide is cross-referenced to the student text *Rocks, Minerals, and Erosion*.

Suggested Use: Grade 4; Teacher Reference

**Science Seekers series** (Print-Integrated Resource). (Science Seekers series). Tom Snyder Productions (TPU), 2000.

Science Seekers have a multi-media format to engage students in core science content through cooperative learning and hands-on activities. This resource utilizes Interactive Group Software that uses technology to get students in a group to interact with each other. The following resources are recommended for Manitoba:

- *Hidden in Rocks* (Grade 7)
- *Safe Water* (Grade 8)

Student teams receive a message through an introductory video that sets up the problem they are to solve (their mission). The teams use information sheets and hands-on activities to help with their mission. Students also see professional scientists using technological tools such as satellite imagery and computer modeling to solve similar problems, and have opportunities to use some of the tools themselves. The accompanying teacher guides are provided in both print and electronic format and include extensive support on the use of the program, including guidance for installing the software, background information related to the student problem, organizing the class, assessment, and reproducibles.

**Science Seekers: Hidden in Rocks.** (CD-ROM). (Science Seekers series). Tom Snyder Productions (TPU), 2000. ISBN XSSK HID U 01.

This resource addresses outcomes from Grade 7, Cluster 4: *Earth's Crust* related to rock formation, plate tectonics, and weathering and erosion. The inclusion of fossils provides a link to Grade 4, Cluster 4: *Rocks, Minerals, and Erosion*, and the use of satellite imagery builds upon Grade 6: Cluster 4: *The Solar System*. Three investigations are included, supporting the development of scientific inquiry skills.

Suggested Use: Grade 7; Student-Depth; Teacher Reference

**Science Seekers: Safe Water.** (CD-ROM). (Science Seekers series). Tom Snyder Productions (TPU), 2000. ISBN XSSK SAF U 01.

This resource addresses outcomes from Grade 8, Cluster 4: *Water Systems* related to drinking water, water pollution, and the management of water resources. The incorporation of concepts related to movement of groundwater through different types of rock provides links to Grade 7, Cluster 4: *Earth's Crust*. Three investigations are included, supporting the development of scientific inquiry skills.

Suggested Use: Grade 8; Student-Depth; Teacher Reference

**Sciencepower series** (Print-Integrated Resource). Gibbons, Keith. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000.

The Sciencepower resources recommended for use in Manitoba include the following **previously recommended** resources:

- *Sciencepower 7* (student text, teacher's resource binder)
- *Sciencepower 8* (student text, teacher's resource binder)
- *Sciencepower 9* (student text, teacher's resource binder)

The following **new components** have now been recommended:

- *Sciencepower 7. Blackline Masters*

- *Sciencepower 7. Computerized Assessment Bank*
- *Sciencepower 7. Video Modules*
- *Sciencepower 8. Blackline Masters*
- *Sciencepower 8. Computerized Assessment Bank*
- *Sciencepower 8. Video Modules*

This series addresses the majority of specific learning outcomes for all clusters in the Grade 7 to Senior 1 science curriculum in a comprehensive manner.

**Sciencepower 7. Blackline Masters** (Print-Non-Fiction). Balchandani, Vijaya. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. 750 p. ISBN 0-07-560772-7.

These blackline masters support the previously recommended student texts and teacher's resource binders at Grades 7. They follow the chapter-by-chapter organization of the student texts and include a variety of assessment tasks and student learning activities. The assessment tasks take into account a variety of learning approaches and include items such as maps, timeline construction, poster creation, as well as quizzes and unit tests. Overhead masters for lesson support are also included.

Suggested Use: Grade 7; Student-Breadth & Depth; Teacher Reference

**Sciencepower 7. Computerized Assessment Bank** (CD-ROM). Balchandani, Vijaya. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. ISBN 0-07-560773-5.

These assessment tools contain a bank of 1500 questions, with 10 different question types (e.g., multiple choice, short answer, problem solving, application). Answer keys are included. The program allows teachers to add their own questions and allows for the creation of a grade book. An on-screen help system is available and a handbook is provided for installation and use of CD-ROM.

Suggested Use: Grade 7; Student-Breadth & Depth; Teacher Reference

**Sciencepower 7. Video Modules** (Video). Balchandani, Vijaya. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. ISBN 0-07-086375-X.

These videos support the student text and teacher's resource binder at Grade 7. A print teacher's guide for each video provides a brief synopsis and viewer questions, including follow-up questions. The videos are integrated with other components in the series, with the teacher's resource binders referencing their use. The video contents include mini-segments from the Discovery Channel, as well as a variety of experiments.

Suggested Use: Grade 7; Student-Breadth & Depth; Teacher Reference

**Sciencepower 8. Blackline Masters.** (Print-Non-Fiction). DeSouza, Gail. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. 633 p. ISBN 0-07-560774-3.

These blackline masters support the previously recommended student texts and teacher's resource binders at Grades 8. They follow the chapter-by-chapter organization of the student texts and include a variety of assessment tasks and student learning activities. The assessment tasks take into account a variety of learning approaches and include items such as maps, timeline construction, poster creation, as well as quizzes and unit tests. Overhead masters for lesson support are also included.

Suggested Use: Grade 8; Student-Breadth & Depth; Teacher Reference

**Sciencepower 8. Computerized Assessment Bank.** (CD-ROM). DeSouza, Gail. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. ISBN 0-07-560775-1.

These assessment tools contain a bank of 1500 questions, with 10 different question types (e.g., multiple choice, short answer, problem solving, application). Answer keys are included. The program allows teachers to add their own questions and allows for the creation of a grade book. An on-screen help system is available and

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a handbook is provided for installation and use of CD-ROM.

Suggested Use: Grade 8; Student-Breadth & Depth; Teacher Reference

**Sciencepower 8. Video Modules.** (Video). DeSouza, Gail. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. ISBN 0-07-086376-8.

These videos support the student text and teacher's resource binder at Grade 8. A print teacher's guide for each video provides a brief synopsis and viewer questions, including follow-up questions. The videos are integrated with other components in the series, with the teacher's resource binders referencing their use. The video contents include mini-segments from the Discovery Channel, as well as a variety of experiments.

Suggested Use: Grade 8; Student-Breadth & Depth; Teacher Reference

**Sciencepower 9. Blackline Masters.** (Print-Non-Fiction). Gibbons, Keith. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. 845 p. ISBN 0-07-560776-X.

These blackline masters support the previously recommended student texts and teacher's resource binders at Senior 1. They follow the chapter-by-chapter organization of the student texts and include a variety of assessment tasks and student learning activities. The assessment tasks take into account a variety of learning approaches and include items such as maps, timeline construction, poster creation, as well as quizzes and unit tests. Overhead masters for lesson support are also included.

Suggested Use: Grade 9; Student-Breadth & Depth; Teacher Reference

**Sciencepower 9. Computerized Assessment Bank. Ontario** (CD-ROM). (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. ISBN 0-07-560777-8.

These assessment tools contain a bank of 1500 questions, with 10 different question types (e.g., multiple choice, short answer, problem solving, application). Answer keys are included. The program allows teachers to add their own questions and allows for the creation of a grade book. An on-screen help system is available and a handbook is provided for installation and use of CD-ROM.

Suggested Use: Grade 9; Student-Breadth & Depth; Teacher Reference

**Sciencepower 9. Video Modules.** (Video). Gibbons, Keith. (Sciencepower series). McGraw-Hill Ryerson Limited (MHR), 2000. ISBN 0-07-086377-6.

These videos support the student text and teacher's resource binder at Senior 1. A print teacher's guide for each video provides a brief synopsis and viewer questions, including follow-up questions. The videos are integrated with other components in the series, with the teacher's resource binders referencing their use. The video contents include mini-segments from the Discovery Channel, as well as a variety of experiments.

Suggested Use: Grade 9; Student-Breadth & Depth; Teacher Reference

**Take a Technowalk: To Learn About Mechanisms and Energy** (Print-Non-Fiction). Trifolium Books Inc. (GDS), 2000. 96 p. ISBN 1-55244-004-4.

This teacher resource provides general support for Grades 5 to 8 in the area of technology. Teachers are encouraged to take students on a "technowalk" to identify technology in the local environment and in the community. The resource contains major section headings such as "Learning about Mechanisms" and "Learning about Energy", which address specific areas such as simple machines (Grade 5) and electricity (Grade 6). *Take a Technowalk* provides suggestions for hands-on learning activities and ideas for field trips that help students make connections to the world around

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them. Additional supports include a parental letter requesting materials for use in the classroom, a reading list, cross-curricular connections, and assessment and evaluation blackline masters.

Suggested Use: Grade 5; Grade 6; Grade 7; Grade 8; Grade 9; Teacher Reference

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## Index of Suggested Uses

This index suggests resource designations including grade level, depth or breadth, and teacher or student.

### Grade 1

Pan Canadian Science Place series: Design Team  
Pan Canadian Science Place series: Design Team Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: Earth Watch  
Pan Canadian Science Place series: Earth Watch Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: It's Alive!  
Pan Canadian Science Place series: It's Alive! Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: Pan Canadian Science Place Program and Assessment Guide Grades 1-3  
Pan Canadian Science Place series: What's It Like?  
Pan Canadian Science Place series: What's It Like? Teacher's Guide - Manitoba Edition

### Grade 2

Addison Wesley Science & Technology series: All About Animals  
Addison Wesley Science & Technology series: In the Kitchen  
Addison Wesley Science & Technology series: Mechanics at Work  
Addison Wesley Science & Technology series: Science & Technology Flip Chart Book Grade 2  
Addison Wesley Science & Technology series: Science & Technology Teacher's Guide Grade 2  
Addison Wesley Science & Technology series: Weather Watch

### Grade 3

Sci-Tech Connections 3 series: Brainline Masters Resource 1-3  
Sci-Tech Connections 3 series: The Twins Get All Charged Up

### Grade 4

Sci-Tech Connections 4 series: A Visit to the Castle  
Sci-Tech Connections 4 series: Brainline Masters Resource 4-8  
Sci-Tech Connections 4 series: Light, Sound, Action  
Science & Technology Activities Resource series: Habitats and Communities. Student Journal  
Science & Technology Activities Resource series: Habitats and Communities. Teacher's Guide  
Science & Technology Activities Resource series: Rocks, Minerals, and Erosion. Student Journal  
Science & Technology Activities Resource series: Rocks, Minerals, and Erosion. Teacher's Guide

### Grade 5

Hands-on Science series: Hands-on Science. Level Five.  
Inventeering: A Problem Solving Approach to Teaching Technology  
Pan Canadian Science Place series: Putting It In Motion  
Pan Canadian Science Place series: Putting It In Motion. Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: What's the Matter.  
Pan Canadian Science Place series: What's the Matter. Teacher's Guide - Manitoba Edition  
Science & Technology Activities Resource series: Life Systems: Human Organs  
Science & Technology Activities Resource series: Life Systems: Human Organs. Teacher's Guide  
Take a Technowalk: To Learn About Mechanisms and Energy

### Grade 6

EarthStation Library™: Astronomy Explorer  
Hands-on Science series: Hands-on Science. Level Six  
Inventeering: A Problem Solving Approach To Teaching Technology  
Pan Canadian Science Place series: Out of This World  
Pan Canadian Science Place series: Out of This World. Teacher's Guide - Manitoba Edition

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Pan Canadian Science Place series: Program and Assessment Guide. Grades 4-6  
Science & Technology Activities Resource series: Diversity of Living Things  
Science & Technology Activities Resource series: Diversity of Living Things. Teacher's Guide  
Take a Technowalk: To Learn About Mechanisms and Energy

### **Grade 7**

EarthStation Library™: Geology Explorer.  
Inventeering: A Problem Solving Approach To Teaching Technology  
Nelson Science & Technology series: Nelson Science & Technology 7. Computerized Assessment Bank  
Sci-Tech Connections 7 series: Structural Interactions Unit 7A  
Sci-Tech Connections 7 series: The Solution Is... Unit 7B  
Science Seekers: Hidden in Rocks.  
Sciencepower 7. Blackline Masters  
Sciencepower 7. Computerized Assessment Bank  
Sciencepower 7. Video Modules  
Take a Technowalk: To Learn About Mechanisms and Energy

### **Grade 8**

EarthStation Library™: Oceans-Climate Explorer  
Experimenting With Light and Colour.  
Experimenting With Light and Colour: Teacher's Guide to Accompany Experimenting With Light and Colour  
Inventeering: A Problem Solving Approach To Teaching Technology  
Nelson Science & Technology series: Nelson Science & Technology 8. Computerized Assessment Bank  
Sci-Tech Connections 8 series: Liquids and Gas...I Now Pronounce You Fluids Unit 8B  
Science Seekers: Safe Water.  
Sciencepower 8. Blackline Masters.  
Sciencepower 8. Computerized Assessment Bank  
Sciencepower 8. Video Modules.  
Take a Technowalk: To Learn About Mechanisms and Energy

### **Grade 9**

EarthStation Library™: Astronomy Explorer  
Nelson Science series: Nelson Science & Technology 9. Computerized Assessment Bank  
Sciencepower 9. Blackline Masters.  
Sciencepower 9: Computerized Assessment Bank  
Sciencepower 9. Video Modules.  
Take a Technowalk: To Learn About Mechanisms and Energy

### **Student-Breadth & Depth**

Nelson Science & Technology series: Nelson Science & Technology 7. Computerized Assessment Bank  
Nelson Science & Technology series: Nelson Science & Technology 8. Computerized Assessment Bank  
Nelson Science series: Nelson Science & Technology 9. Computerized Assessment Bank  
Sciencepower 7. Blackline Masters  
Sciencepower 7. Computerized Assessment Bank  
Sciencepower 7. Video Modules  
Sciencepower 8. Blackline Masters.  
Sciencepower 8. Computerized Assessment Bank  
Sciencepower 8. Video Modules.  
Sciencepower 9. Blackline Masters.  
Sciencepower 9. Video Modules.  
Sciencepower 9: Computerized Assessment Bank

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## Student-Depth

Addison Wesley Science & Technology series: All About Animals  
Addison Wesley Science & Technology series: In the Kitchen  
Addison Wesley Science & Technology series: Mechanics at Work  
Addison Wesley Science & Technology series: Science & Technology Flip Chart Book Grade 2  
Addison Wesley Science & Technology series: Science & Technology Teacher's Guide Grade 2  
EarthStation Library™: Astronomy Explorer  
EarthStation Library™: Geology Explorer.  
EarthStation Library™: Oceans-Climate Explorer  
Experimenting With Light and Colour.  
Pan Canadian Science Place series: Design Team  
Pan Canadian Science Place series: Earth Watch  
Pan Canadian Science Place series: It's Alive!  
Pan Canadian Science Place series: Out of This World  
Pan Canadian Science Place series: Putting It In Motion  
Pan Canadian Science Place series: What's It Like?  
Pan Canadian Science Place series: What's the Matter  
Science & Technology Activities Resource series: Diversity of Living Things. Student Journal  
Science & Technology Activities Resource series: Habitats and Communities. Student Journal  
Science & Technology Activities Resource series: Life Systems: Human Organs  
Science & Technology Activities Resource series: Rocks, Minerals, and Erosion. Student Journal  
Science Seekers: Hidden in Rocks.  
Science Seekers: Safe Water.

## Teacher Reference

Addison Wesley Science & Technology series: Science & Technology Teacher's Guide Grade 2  
EarthStation Library™: Astronomy Explorer  
EarthStation Library™: Geology Explorer  
EarthStation Library™: Oceans-Climate Explorer  
Experimenting With Light and Colour: Teacher's Guide to accompany Experimenting With Light and Colour

Hands-on Science series: Hands-on Science. Level Five  
Hands-on Science series: Hands-on Science. Level Six  
Inventeering: A Problem Solving Approach To Teaching Technology  
Nelson Science & Technology series: Nelson Science & Technology 7. Computerized Assessment Bank  
Nelson Science & Technology series: Nelson Science & Technology 8. Computerized Assessment Bank  
Nelson Science series: Nelson Science & Technology 9. Computerized Assessment Bank  
Pan Canadian Science Place series: Design Team Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: Earth Watch Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: It's Alive! Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: Out of This World Teacher's Guide  
Pan Canadian Science Place series: Pan Canadian Science Place Program and Assessment Guide Grade 1-3  
Pan Canadian Science Place series: Program and Assessment Guide Grade 4-6  
Pan Canadian Science Place series: Putting It In Motion. Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: What's It Like? Teacher's Guide - Manitoba Edition  
Pan Canadian Science Place series: What's the Matter. Teacher's Guide - Manitoba Edition  
Sci-Tech Connections 3 series: Brainline Masters Resource 1-3  
The Sci-Tech Connections 3 series: Twins Get all Charged Up  
Sci-Tech Connections 4 series: A Visit to a Castle  
Sci-Tech Connections 4 series: Brainline Masters Resource 4-8  
Sci-Tech Connections 4 series: Light, Sound, Action  
Sci-Tech Connections 7 series: Structural Interactions Unit 7A  
Sci-Tech Connections 7 series: The Solution Is... Unit 7B  
Sci-Tech Connections 8 series: Liquids and Gas...I Now Pronounce You Fluids Unit 8B  
Science & Technology Activities Resource series: Diversity of Living Things. Teacher's Guide  
Science & Technology Activities Resource series: Habitats and Communities. Teacher's Guide

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Science & Technology Activities Resource series:  
Life Systems: Human Organs  
Science & Technology Activities Resource series:  
Rocks, Minerals, and Erosion. Teacher's  
Guide  
Science Seekers: Hidden in Rocks.  
Science Seekers: Safe Water.  
Sciencepower 7. Blackline Masters  
Sciencepower 7. Computerized Assessment Bank  
Sciencepower 7. Video Modules  
Sciencepower 8. Blackline Masters.  
Sciencepower 8. Computerized Assessment Bank  
Sciencepower 8. Video Modules.  
Sciencepower 9. Blackline Masters.  
Sciencepower 9. Video Modules.  
Sciencepower 9: Computerized Assessment Bank  
Take a Technowalk: To Learn About Mechanisms  
and Energy

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## Media Index

This index lists resources by format such as CD-ROM, video, integrated resource, or print non-fiction.

### CD-ROM

EarthStation Library™: Astronomy Explorer  
EarthStation Library™: Geology Explorer.  
EarthStation Library™: Oceans-Climate Explorer  
Nelson Science & Technology series: Nelson Science & Technology 7. Computerized Assessment Bank  
Nelson Science & Technology series: Nelson Science & Technology 8. Computerized Assessment Bank  
Nelson Science series: Nelson Science & Technology 9. Computerized Assessment Bank  
Science Seekers: Hidden in Rocks  
Science Seekers: Safe Water  
Sciencepower 7. Computerized Assessment Bank  
Sciencepower 8. Computerized Assessment Bank  
Sciencepower 9: Computerized Assessment Bank

### Print-Integrated Resource

Addison Wesley Science & Technology series  
EarthStation Library™ series  
Hands-on Science series  
Nelson Science & Technology series  
Nelson Science series  
Pan Canadian Science Place series  
Sci-Tech Connections series  
Science & Technology Activities Resource series  
Science Seekers series  
Sciencepower series

### Print-Non-Fiction

Addison Wesley Science & Technology series: All About Animals  
Addison Wesley Science & Technology series: In the Kitchen  
Addison Wesley Science & Technology series: Mechanics at Work  
Addison Wesley Science & Technology series: Science & Technology Flip Chart Book Grade 2

Addison Wesley Science & Technology series: Science & Technology Teacher's Guide Grade 2  
Addison Wesley Science & Technology series: Weather Watch  
Experimenting With Light and Colour.  
Experimenting With Light and Colour: Teacher's Guide to accompany Experimenting With Light and Colour  
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Pan Canadian Science Place series: Earth Watch Teacher's Guide - Manitoba Edition  
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Pan Canadian Science Place series: It's Alive! Teacher's Guide - Manitoba Edition  
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Pan Canadian Science Place series: Out of This World Teacher's Guide - Manitoba Edition  
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Pan Canadian Science Place series: Program and Assessment Guide. Grades 4-6  
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Pan Canadian Science Place series: Putting It In Motion Teacher's Guide - Manitoba Edition  
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Pan Canadian Science Place series: What's It Like? Teacher's Guide - Manitoba Edition  
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Pan Canadian Science Place series: What's the Matter Teacher's Guide - Manitoba Edition  
Sci-Tech Connections 3 series: Brainline Masters Resource 1-3  
Sci-Tech Connections 3 series: The Twins Get all Charged Up  
Sci-Tech Connections 4 series: A Visit to a Castle  
Sci-Tech Connections 4 series: Brainline Masters Resource 4-8

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Sci-Tech Connections 4 series: Light, Sound,  
Action  
Sci-Tech Connections 7 series: Structural  
Interactions Unit 7A  
Sci-Tech Connections 7 series: The Solution Is...  
Unit 7B  
Sci-Tech Connections 8 series: Liquids and  
Gas...I Now Pronounce You Fluids Unit 8B  
Science & Technology Activities Resource series:  
Diversity of Living Things. Student Journal  
Science & Technology Activities Resource series:  
Diversity of Living Things. Teacher's Guide  
Science & Technology Activities Resource series:  
Habitats and Communities. Student Journal  
Science & Technology Activities Resource series:  
Habitats and Communities. Teacher's Guide  
Science & Technology Activities Resource series:  
Life Systems: Human Organs  
Science & Technology Activities Resource series:  
Life Systems: Human Organs. Teacher's  
Guide  
Science & Technology Activities Resource series:  
Rocks, Minerals, and Erosion. Student  
Journal  
Science & Technology Activities Resource series:  
Rocks, Minerals, and Erosion. Teacher's  
Guide  
Sciencepower 7. Blackline Masters  
Sciencepower 8. Blackline Masters.  
Sciencepower 9. Blackline Masters.  
Take a Technowalk: To Learn About Mechanisms  
and Energy

## **Video**

Sciencepower 7. Video Modules  
Sciencepower 8. Video Modules.  
Sciencepower 9. Video Modules.

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## Distributor Directory

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**EOA** EOA Scientific Systems, Inc.  
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Web: <http://www.mcgrawhill.ca>

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**NEL** Nelson Thomson Learning  
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Email: [inquire@nelson.com](mailto:inquire@nelson.com)  
Web: <http://www.nelson.com>

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Web: <http://www.peguis.com>

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