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**STARTING POINTS:**  
**A RESEARCH SUMMARY FOR SCHOOLS PLANNING  
INTERVENTION PROGRAMS**

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Fall 1998



Ministry of Education

**\*\*Please note that the TABLE OF CONTENTS for this document can be found at the end of this file.\*\***

## INTRODUCTION

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*Starting Points: A Research Summary for Schools Planning Intervention Programs* is intended to be an initial, rather than a comprehensive, resource on intervention. It serves two main purposes:

- to provide a review of selected research in the field of intervention;
- to describe briefly a number of interventions in early education, reading, mathematics, and social and emotional development.

It is important to note that the Ministry of Education has not evaluated the interventions described in this document. They are presented to provide practical examples of interventions in place in schools and communities in BC and elsewhere. Their inclusion does not imply Ministry recommendation or endorsement.

Since 1995 the Ministry has been involved in discussions about how schools can improve student success and how the Ministry can support this objective. The primary focus for these discussions is the estimated 20% of students who are not acquiring important skills in the critical areas of reading, mathematics, and citizenship and social responsibility.

In 1995 a working group representing key educational organizations within the province examined issues relating to student success and made recommendations for policy development. *Addressing Student Differences: Next Steps* (July 1997) outlines these recommendations.

*Starting Points: A Research Summary for Schools Planning Intervention Programs* addresses the importance of intervention for students who are experiencing difficulty in important learning areas. It builds on an earlier document, *Early Intervention of Learning Difficulties* (1996) which focuses primarily on intervention strategies for difficulties in reading.

The Ministry of Education defines intervention as “any planned, systematic program of services necessary to prevent or minimize the effects of difficulties on individuals or their families.”

## **FEATURES OF EFFECTIVE INTERVENTION**

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Features of effective intervention draw from research evaluating the effects of early intervention on success in school and in later life.

### **Effective Early Childhood Intervention—**

- emphasizes parents' involvement and builds on the strengths of families and children;
- combines consistent family support, regular home visits, and early education services;
- links families with community resources;
- strengthens parents' ability to view their children as able, active learners;
- encourages children to plan, initiate, and review their own learning activities;
- encourages children to solve their intellectual, social, and physical problems and to assume a measure of control over their environment;
- promotes active learning;
- incorporates adult-child interaction;
- includes well-defined learning environments and a predictable daily routine.

### **Effective Reading Intervention—**

- is based on an understanding of current research in cognitive development, language development, reading difficulties, and instructional processes;
- develops early literacy concepts through many experiences with oral and written language;
- uses a balanced approach that combines development of phonological awareness, instruction in the reading of text, and development of reading comprehension strategies within the context of meaningful reading experiences;

- recognizes the strong empirical relationship between early phonological awareness and success in reading;
- develops phonological awareness through a range of activities that draw a student's attention to the sounds within spoken words;
- provides many and varied language experiences, during which students notice and use letters and words;
- promotes listening comprehension and active use of oral language;
- provides opportunities for students to engage in daily discussions and reflection about what they read;
- promotes greater complexity in interpretative responses by incorporating reading aloud by the teacher (or the teacher and children together) within the context of sharing experiences, ideas, and opinions;
- maximizes the effects of instruction by teaching reading and writing together;
- enables students to respond to literature, to guide their own comprehension, and to make inferences while they are reading;
- recognizes that students construct their own meaning which may be different for different readers;
- uses modelling as an important form of classroom support for literacy learning.

**Effective Mathematics Intervention—**

- acknowledges that students acquire three types of mathematical knowledge—fluent knowledge of mathematical facts; knowledge of rules, algorithms, and procedures; and conceptual knowledge of the relationships among different pieces of information;
- acknowledges that students create their own meaning through solving complex, realistic mathematical problems and that through this process they can develop a deep and enduring understanding of mathematics;

- provides opportunities for students to actively engage in questioning, hypothesizing, defining, and explaining;
- provides opportunities for students to take part in mathematical discussions and group problem solving;
- provides cooperative learning experiences that mirror the work force, in which people collaborate to solve complex problems;
- enhances mathematical learning at all grade levels and at all stages through the appropriate use of technology, including computers and calculators;
- uses modelling as an important way of reflecting thinking and problem solving strategies.

**Effective Social and Emotional Intervention—**

- acknowledges that students learn social responsibility in the same way they become proficient in other important areas of learning, with direct instruction and opportunities for guided practice and generalization;
- provides integrated services, strategies, and collaboration among families, schools, community agencies, health and social agencies;
- focuses on improved health and nutrition programs and enhanced economic and social conditions;
- provides family support networks;
- includes community and school youth programs;
- links to initiatives for community development and social change.

## OVERVIEW OF INTERVENTIONS

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This overview summarizes programs and strategies included in the following sections. For further information, see page numbers noted.

### Early Education

Title/Purpose	Premise	Experiences	References/ Contact	Page
<p><b>Aboriginal Head Start Program:</b> to meet the spiritual, emotional, intellectual, and physical needs of Aboriginal children</p>	<ul style="list-style-type: none"> <li>• integrates Aboriginal culture and values</li> <li>• based on caring, creativity, and pride</li> <li>• provides a holistic and safe environment</li> </ul>	<ul style="list-style-type: none"> <li>• designed in consultation with local Aboriginal groups</li> <li>• involves parents in the development and implementation</li> <li>• program experiences will vary</li> </ul>	<p>Health Canada, AHS Regional Office, 440—757 West Hastings Street, Vancouver, BC V6C 1A1; Phone (604) 666-7111, FAX (604) 666-8986</p>	<p>18</p>
<p><b>Building Blocks:</b> to provide promotion, prevention, and early support and intervention for preschool age children</p>	<ul style="list-style-type: none"> <li>• encourages parent support and active communities</li> <li>• enhances the physical, emotional, and social development of infants and toddlers</li> </ul>	<ul style="list-style-type: none"> <li>• initial phase of the pilot program</li> <li>• child-care settings</li> <li>• community-based strategies to prevent Fetal Alcohol Syndrome</li> <li>• parent support groups</li> </ul>	<p>Ministry for Children and Families, Communications Division, Victoria, B. C. Phone (250) 356-1775</p>	<p>19</p>

**Early Education (continued)**

<b>Title/Purpose</b>	<b>Premise</b>	<b>Experiences</b>	<b>References/ Contact</b>	<b>Page</b>
<p><b>Community Action Program for Children (CAPC):</b> to support the development of a continuum of community services for at-risk children, ages birth to 6 years old</p>	<ul style="list-style-type: none"> <li>• provides services early in children’s lives</li> <li>• enables children to develop their potential</li> <li>• supports children to be prepared to begin school</li> </ul>	<ul style="list-style-type: none"> <li>• parent/family resource centres</li> <li>• child development centres</li> <li>• parenting education</li> <li>• infant stimulation</li> <li>• services vary based on community needs</li> </ul>	<p>Health Canada, Health Promotion and Programs Branch, 440–757 West Hastings Street, Vancouver, BC V6C 1A1; Phone (604) 666-2729; FAX (604) 666-8986</p>	<p>20</p>
<p><b>Full Day Kindergarten:</b> to enrich the language, culture, and socialization of young Aboriginal students</p>	<ul style="list-style-type: none"> <li>• clearly stated objectives should relate to goals for Aboriginal students in Kindergarten</li> </ul>	<ul style="list-style-type: none"> <li>• parent and guardian involvement in planning</li> <li>• integrated themes are developed from an Aboriginal perspective</li> </ul>	<p>Aboriginal Education Initiatives, Ministry of Education, Victoria, BC; Phone (250) 387-6450</p>	<p>20</p>

**Early Education (continued)**

Title/Purpose	Premise	Experiences	References/ Contact	Page
<p><b>High/Scope Perry Preschool Project:</b> to promote children’s intellectual, social, and physical development</p>	<ul style="list-style-type: none"> <li>• emphasizes active learning</li> <li>• children construct their own knowledge from activities they plan and carry out themselves</li> </ul>	<ul style="list-style-type: none"> <li>• language</li> <li>• representing experiences and ideas</li> <li>• classification, seriation, number concepts, and spatial relations</li> <li>• time</li> <li>• computer literacy</li> <li>• movement and dance</li> </ul>	<p>Luster, T. and McAadoo, H. 1996. Family and child influences on educational attainment: A secondary analysis of the High/Scope Perry Preschool data. <i>Developmental Psychology</i>, 32(1), 26-39.</p> <p>Schweinhart, L. J. 1988. <i>A school administrator’s guide to early childhood programs</i>. Ypsilanti, MI: High/Scope Educational Research Foundation. ED327320.</p>	21
<p><b>Project Spectrum:</b> to provide assessment and curriculum for preschool and early primary aged children who are considered to be at risk for school failure</p>	<ul style="list-style-type: none"> <li>• incorporates assessment and learning experiences</li> <li>• teachers identify and enhance the spectrum of intelligences or abilities</li> </ul>	<ul style="list-style-type: none"> <li>• experiences incorporate language, math, music, art, social understanding, science, and movement.</li> </ul>	<p>Project Zero, Harvard Graduate School of Education, 321 Longfellow Hall, 13 Appian Way, Cambridge, MA 02138; FAX (617) 495-9709; email: info@pz.harvard.edu</p>	22

**Reading**

Title/Purpose	Premise	Experiences	References/ Contact	Page
<p><b>Aboriginal Language and Culture Programs:</b> to develop knowledge, understanding, and fluency in an Aboriginal student’s heritage language and/or culture</p>	<ul style="list-style-type: none"> <li>• Aboriginal language and culture programs are developed with strong involvement of the local Aboriginal community</li> <li>• Aboriginal students should develop an understanding of the meaning and wisdom carried in their original language</li> </ul>	<ul style="list-style-type: none"> <li>• learning experiences, content, and methods reflect Aboriginal culture, language, values, and history</li> <li>• experiences may include vocabulary development, oral and written language, history, art, music, dance, science, community links, and other activities</li> </ul>	<p>Aboriginal Education Initiatives, Ministry of Education, Victoria, BC; Phone (250) 387-6450</p>	<p>29</p>
<p><b>Early Phonological Awareness:</b> to enhance children’s ability to understand the sound aspects of language</p>	<ul style="list-style-type: none"> <li>• early phonological awareness is essential for reading success</li> <li>• phonological awareness is a developmental process</li> </ul>	<ul style="list-style-type: none"> <li>• instruction is embedded in rich language activities that direct children’s attention to the sounds of spoken words</li> <li>• includes rhymes, songs, alliterative sequences, reading aloud, writing, pattern reading, puppets, computer programs, etc.</li> </ul>	<p>Snow, C. E., Burns, M. S., and Griffin, P. (eds.). 1998. <i>Preventing reading difficulties in young children</i>. Washington, DC: National Academy Press.</p>	<p>29</p>

**Reading (continued)**

Title/Purpose	Premise	Experiences	References/ Contact	Page
<p><b>Family Literacy Programs:</b> to enhance the literacy abilities of and encourage parents to read daily to their children</p>	<ul style="list-style-type: none"> <li>• the literacy environment within the home has an important effect on the literacy development of children</li> </ul>	<ul style="list-style-type: none"> <li>• programs vary to reflect and meet the needs of parents and children within the community</li> <li>• programs are often based on a local needs assessment</li> </ul>	<p>Literacy BC Phone: 1 (800) 663-1293</p> <p>National Literacy Secretariat Phone: (819) 953-5280</p>	<p>31</p>
<p><b>Holistic Early Literacy Program:</b> to provide a balanced approach to early literacy development</p>	<ul style="list-style-type: none"> <li>• incorporates a balanced range of literacy activities</li> <li>• designed for Grade 1 students at risk for reading difficulties</li> </ul>	<ul style="list-style-type: none"> <li>• shared reading with predictable books</li> <li>• shared writing using the language experience approach</li> <li>• increasing attention to print cues</li> <li>• making meaningful predictions</li> <li>• internalizing language structures</li> <li>• seeing links between oral and written language</li> </ul>	<p>Department of Elementary Education, University of Alberta, 551 Education Centre South, Edmonton, AB T6G 2G5; Phone (403) 492-4273, FAX (403) 492-7622</p>	<p>32</p>

**Reading (continued)**

<b>Title/Purpose</b>	<b>Premise</b>	<b>Experiences</b>	<b>References/ Contact</b>	<b>Page</b>
<p><b>Project CRISS:</b> to help students organize, understand, and remember information</p>	<ul style="list-style-type: none"> <li>• a cross-curricular program</li> <li>• enhances a student's ability to organize and use strategies effectively</li> <li>• validated for students in Grades 10 through 12</li> </ul>	<ul style="list-style-type: none"> <li>• focuses on seven areas: Principles and Philosophy, Textbook Analysis, Discussion Strategies, Active Strategies for Learning and Organizing, Writing Strategies, Vocabulary, Assessment</li> </ul>	<p>Project CRISS, 233 First Avenue East, Kalispell, Montana 59901; Phone (406) 756-5011; FAX (406) 756-4510</p>	<p>33</p>
<p><b>Reading Recovery:</b> to help low-achieving Grade 1 students learn to read and write</p>	<ul style="list-style-type: none"> <li>• focuses on the student's strengths</li> <li>• provides instruction in strategies that will help students become independent readers</li> <li>• provides a strong foundation in reading early in the student's schooling</li> </ul>	<ul style="list-style-type: none"> <li>• reading for meaning</li> <li>• self-monitoring and self-correcting</li> <li>• hearing and recording sounds in words</li> <li>• creating and representing meaning</li> </ul>	<p>Canadian Institute of Reading Recovery, University of Toronto, Scarborough, 1265 Military Trail, Scarborough, ON M1C 1A4; Phone (416) 396-6322; FAX (416) 396-6324</p>	<p>34</p>

**Reading (continued)**

<b>Title/Purpose</b>	<b>Premise</b>	<b>Experiences</b>	<b>References/ Contact</b>	<b>Page</b>
<p><b>Shared Learnings:</b> to provide teachers with guidance in integrating Aboriginal topics in all subject areas at an introductory level</p>	<ul style="list-style-type: none"> <li>• Aboriginal peoples have strong, dynamic, evolving cultures that have adapted to changing world events</li> <li>• Aboriginal peoples' values and beliefs are strong, durable, and relevant</li> <li>• to understand Aboriginal issues, it is necessary to understand and appreciate that all contemporary events have their roots in history</li> <li>• language is the base of culture; Aboriginal cultures and languages have an important place in society</li> </ul>	<ul style="list-style-type: none"> <li>• integrate Aboriginal content</li> <li>• create a greater sensitivity to and respect for the diversity of Aboriginal peoples in BC</li> <li>• encourage support and participation of local Aboriginal communities</li> </ul>	<p>Aboriginal Education Initiatives, Ministry of Education, Victoria, BC; Phone (250) 387-6450</p>	<p>35</p>

**Reading (continued)**

<b>Title/Purpose</b>	<b>Premise</b>	<b>Experiences</b>	<b>References/ Contact</b>	<b>Page</b>
<p><b>Success for All:</b> to ensure that virtually every student will finish Grade 3 with grade-level reading skills</p>	<ul style="list-style-type: none"> <li>• for students in pre-K through Grade 5</li> <li>• prevents or intervenes in the development of learning problems</li> <li>• effectively organizes instructional and family support resources within the regular classroom</li> </ul>	<ul style="list-style-type: none"> <li>• language development and phonological awareness in the early grades</li> <li>• partner reading; summarizing stories; identifying characters, settings, and problem solutions; writing; and reading comprehension skills in Grades 2-5</li> </ul>	<p>Madden, N. A. et al. 1992. <i>Success for all: A relentless approach to prevention and early intervention in elementary schools</i>. Arlington, VA: Educational Research Service.</p> <p>Madden, N. A. et al. 1993. <i>Success for all: Longitudinal effects of a restructuring program for inner-city elementary schools</i>. <i>American Educational Research Journal</i>, 30, 123-148.</p>	<p>36</p>

**Mathematics**

Title/Purpose	Premise	Experiences	References/ Contact	Page
<p><b>The Adventures of Jasper Woodbury:</b> to create meaningful contexts for using skills to solve complex, authentic problems, for students in Grade 5 and up</p>	<ul style="list-style-type: none"> <li>• an anchored instruction approach that creates a meaningful context for solving authentic problems</li> <li>• use of complex problems, often necessitating groups working together to bring multiple perspectives</li> </ul>	<ul style="list-style-type: none"> <li>• includes 12 videodisc or CD-ROM based adventures</li> <li>• each video is a narrative that concludes with a challenge as a problem</li> <li>• focuses on finding, formulating, and solving mathematical problems</li> </ul>	<p>Learning Technology Center, Box 45 Peabody, Vanderbilt University, Nashville, TN 37203</p>	<p>40</p>
<p><b>Maneuvers with Mathematics:</b> to address deficiencies in mathematical learning in the middle years</p>	<ul style="list-style-type: none"> <li>• provides hands-on problem solving activities</li> <li>• for students in Grade 5 through 8</li> <li>• makes strong use of scientific calculators and manipulatives</li> </ul>	<ul style="list-style-type: none"> <li>• modules provide a set of investigations, problems, and learning activities</li> <li>• students solve problems, make conjectures, reason, and investigate mathematical relationships and connections</li> <li>• students often work in groups</li> </ul>	<p>University of Illinois at Chicago, 851 S. Morgan Street, SEO 1309, Chicago, IL 60607-7045; Phone (312) 996-8708</p>	<p>40</p>

**Mathematics (continued)**

<b>Title/Purpose</b>	<b>Premise</b>	<b>Experiences</b>	<b>References/ Contact</b>	<b>Page</b>
<p><b>University of Chicago School Mathematics Project (Chicago Math):</b> to promote the ability to think and communicate mathematically</p>	<ul style="list-style-type: none"> <li>• focuses on problem solving</li> <li>• encourages enthusiasm for mathematics</li> <li>• the aim is for students to eventually graduate from secondary school with higher mathematical learning</li> </ul>	<ul style="list-style-type: none"> <li>• uses realistic situations that emerge from students' interests to introduce and develop key mathematical concepts early in the school years</li> <li>• continues through the grades, helping students to see the role of mathematics in daily life and to be able to use mathematics effectively</li> </ul>	<p>University of Chicago School Mathematics Project, 5835 S. Kimbark Avenue, Judd Hall, Chicago, IL 60637; Phone: (312) 702-9770; FAX (312) 702-0248</p>	<p>41</p>

**Social and Emotional Development**

Title/Purpose	Premise	Experiences	References/ Contact	Page
<p><b>Aboriginal Support Services:</b> to assist Aboriginal students to achieve greater success in all school programs</p>	<ul style="list-style-type: none"> <li>Aboriginal Support workers bring to their positions life experiences and knowledge of Aboriginal cultures, values, beliefs, history, and traditions</li> </ul>	<ul style="list-style-type: none"> <li>responsibilities and positions vary</li> <li>provide support and promote cultural growth for Aboriginal students</li> <li>maintain ongoing communication with students, parents/ guardians, educators, community agencies and support people</li> <li>role model, liaison, and advocate</li> </ul>	<p>Aboriginal Education Initiatives, Ministry of Education, Victoria, BC; Phone (250) 387-6450</p>	<p>43</p>
<p><b>Circle of Courage:</b> to help students develop a sense of their own value and strength: a sense of belonging, mastery, independence, and generosity</p>	<ul style="list-style-type: none"> <li>develops and nurtures a student's sense of belonging, independence, achievement, and mastery</li> </ul>	<ul style="list-style-type: none"> <li>fosters positive relationships</li> <li>organizes instruction to foster achievement and mastery</li> <li>enables students to develop a strong sense of social responsibility and self-discipline</li> </ul>	<p>Brendtro, L. K., Brokenleg, M., and Van Bockern, S. 1990. <i>Reclaiming youth at risk: Our hope for the future.</i> Bloomington, IN: National Education Service.</p>	<p>44</p>

**Social and Emotional Development (continued)**

<b>Title/Purpose</b>	<b>Premise</b>	<b>Experiences</b>	<b>References/ Contact</b>	<b>Page</b>
<p><b>Effective Behaviour Support (EBS):</b> to enhance the capacity of schools to educate all students, including those with challenging social behaviours</p>	<ul style="list-style-type: none"> <li>instruction in appropriate positive behaviours helps children attain effective social behaviour patterns that can enhance their overall success in school</li> </ul>	<ul style="list-style-type: none"> <li>a school-wide, comprehensive, instructional approach to developing social and behavioural skills</li> <li>includes teaching appropriate behaviour by demonstration and modeling, and directed practice of effective behaviours</li> </ul>	<p>BC CASE, Rod Johnston, President, School District 8 (Kootenay Lake)</p>	<p>45</p>

## **RESEARCH AND PRACTICE**

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### **Early Childhood: Research**

The ages from birth to 6 years old are critical for development and learning. Most children in BC schools go through similar stages of cognitive and social/emotional development. As they approach school age their memory improves and they become more logical. They use language more precisely. They reflect more on their own learning and develop a greater range of learning strategies. They are better able to plan, control, and evaluate their learning (Morrison et al. 1995).

Children develop intellectually, socially, and emotionally through their interactions with other people at home, in school, in their neighborhoods, and in their communities. Young children who have difficulty meeting the intellectual and social expectations of school often confront challenges in two areas—parenting/social support and verbal/cognitive ability (Yoshikawa 1995).

About 20% of the students in BC schools daily confront a combination of challenging and daunting circumstances. Children are often able to handle one or two challenging conditions. They face significantly increased obstacles when there are multiple challenging factors in their lives. Children who consistently face multiple challenges are at risk of having difficulty making sense of school instruction and working constructively with others. They may be at risk for school failure and, later, for leaving school before graduation.

Successful early childhood programs combine intensive family support, early childhood education, and links to community services. These programs have significant long-term benefits for children. Participants are able to take advantage of educational opportunities. As adults they show greater success in getting and keeping jobs, maintaining a stable home life, and avoiding delinquent or criminal behaviour (Schweinhart et al. 1993).

Programs that have enabled children to become successful in school provide one or more of the following:

- child care and support for parents;
- health and/or dental services for children;
- enhanced educational opportunities and school readiness;
- moral, religious, or cultural guidance;
- improved quality of life and well-being.

Those who develop early childhood programs should have an explicit understanding of the culturally based assumptions underlying developmentally appropriate practice. Programs developed and validated with children from one culture are not automatically appropriate for those of another (Katz 1996). An understanding of what is normal at any stage of development varies within and between cultures. Similarly, an understanding of what is normal development or which behaviours fall within widely held expectations also varies within and between cultures (Edwards 1994).

### **Early Childhood: Practice**

#### *Aboriginal Head Start Program*

The *Aboriginal Head Start Program* is a four year preschool pilot project that integrates Aboriginal culture and values. The mandate of the program is to meet the spiritual, emotional, intellectual, and physical needs of Aboriginal children. The program is based on caring, creativity, and pride, flowing from a knowledge of cultural beliefs and values, within a holistic and safe environment. Each program is designed in consultation with local Aboriginal groups and involves parents in the development and implementation.

Successful programs for Aboriginal children provide balanced and integrated experiences that result in two major goals:

- to reinforce in children a strong sense of their own identity as First Nations or Métis people, and

- to provide them with a strong base of skills, knowledge, and understanding to succeed within modern society.

Successful Aboriginal educational initiatives are developed jointly among Aboriginal communities and community agencies, including schools. They recognize the responsibility of all members of the community for the education of children.

**Reference**

Health Canada, AHS Regional Office  
440—757 West Hastings Street  
Vancouver, BC V6C 1A1  
Phone (604) 666-7111; FAX (604) 666-8986

*Building Blocks*

Building Blocks is a recent province-wide strategy for promotion, prevention, and early support for infants and toddlers and their families. The goals are to—

- promote the physical, intellectual, emotional, and social development of children and families;
- support parents to become self-sufficient, stable, and equipped with good parenting skills;
- encourage communities to take an active role in supporting the healthy growth and development of children.

During the first year of the program, 1997–1998, there are 10 pilot sites. Programs developed in these sites focus on enhancing learning opportunities for parents and children in child-care settings, developing community-based strategies to prevent fetal alcohol syndrome, and linking parents in support and mentoring networks.

**Reference**

Ministry for Children and Families  
Communications Division  
Phone (250) 356-1775

*Community Action Program for Children (CAPC)*

The Community Action Program for Children is delivered through Health Canada regional offices. CAPC provides funding for community groups to establish and deliver educational and intervention services to families of children from birth to 6 years old. The program is jointly managed by the Federal and Provincial or Territorial governments.

Programs focus on children living in low-income families or with teen-age parents, those who have developmental delays or other problems, or children who might be at risk due to another factor. The purpose of the program is to support the development of a continuum of services for at-risk children in the community.

CAPC is intended to provide services early in children's lives so children have a better chance to develop their potential and are better prepared to begin school. Services depend on the needs of the individual community, and can include parent/family resource centres, child development centres, parenting education, and infant stimulation.

**Reference**

Health Canada, Health Promotion and Programs Branch  
440-757 West Hastings Street  
Vancouver, BC V6C 1A1  
Phone (604) 666-2729; FAX (604) 666-8986

*Full Day Kindergarten*

School districts may choose to provide full day Kindergarten programs for Aboriginal children. These programs should have clearly stated objectives relating to student goals. Planning for full day programs should include consultation with parents/guardians and communities. Appropriate objectives include enrichment of language, culture, and socialization.

**Reference**

Aboriginal Education Initiatives  
Ministry of Education  
Victoria, BC  
Phone (250) 387-6450

*High/Scope Perry Preschool Project*

The Perry Preschool Project uses the High/Scope Curriculum. The fundamental premise of this curriculum is that children are active learners who construct their own knowledge from activities they plan and carry out themselves. This concept of active learning affects everything in the curriculum, from teacher training to parent involvement.

The High/Scope Curriculum is organized around key experiences which are divided into a number of categories: active learning, using language, representing experiences and ideas, classification, seriation, number concepts, spatial relations, time, computer literacy, and movement and dance. Key experiences create a frame of reference that helps teachers assess children's progress so work at each stage of development is appropriate and enriching.

The program is intended for 3- and 4-year-old children who attend two years of preschool before entering kindergarten. The program runs 2.5 hours per day, and each family is visited for 1.5 hours per week. A consistent daily routine enables children to develop and follow-up on their plans and ideas. Children manage their own time and develop a sense of responsibility and independence. The daily routine includes a plan-do-review sequence and incorporates large- and small-group activities and clean-up.

Planning gives children consistent opportunities to express their ideas to adults and to see themselves as individuals who can make decisions and act on them. The final phase of the plan-do-review cycle gives children an opportunity to represent their activities in a variety of ways.

The data from the Perry Preschool Project have been exceptionally consistent for decades, and indicate that the program has successfully achieved its objectives. The program incorporates—

- a clearly stated, validated curriculum that features child-initiated activities;
- a curriculum that provides opportunities for children to solve problems independently, to initiate meaningful conversations with others, and to explore materials and interests on their own;
- at least two adults for each group of sixteen to twenty children;

- staff trained in early childhood education and care;
- a clear plan for continued inservice training and for systematic classroom supervision in the curriculum methodology;
- effective evaluation procedures that help the staff observe each child's responses to the environment and the programs;
- active involvement of parents in developing and operating the program, and in parent training activities;
- good administrative backup;
- clear links to community services such as health, nutrition, and social supports.

### **References**

- Barnett, W. S. 1995. Long-term effects of early childhood programs on cognitive and school outcomes. *The Future of Children*, 5(3).
- Schweinhart, L. J. 1988. *A school administrator's guide to early childhood programs*. Ypsilanti, MI: High/Scope Educational Research Foundation. ED327320.
- Weikart, D. P. 1989. *Quality preschool programs: A long-term social investment*. Occasional Paper No. 5. New York: Ford Foundation. ED312033.

### *Project Spectrum*

*Project Spectrum* is a component of *Project Zero*, originating at Harvard University. *Project Spectrum* provides assessment and curriculum for preschool and early primary children who are considered to be at risk for school failure. It is based on the work of Howard Gardner and is predicated on the belief that each child displays a spectrum of intelligences or abilities that can be identified and enhanced.

*Project Spectrum* provides a stimulating environment, identifies children's strengths, and uses this information to plan an individualized program. Assessment and learning experiences are developed in a range of areas reflecting different intelligences: language, math, music, art, social understanding, science, and movement. Assessment is integrated and embedded in meaningful activities. Children 4 years old, and in Kindergarten through Grade 2 take part in the program.

In an evaluation following one year of the program, children showed higher self-esteem, improved classroom adjustment, and higher level of involvement in learning activities. They did not, however, show increased gain in academic achievement compared to children who took part in regular classroom activities.

*Project Spectrum* focuses on building on a child's strengths and diversifying the content of interventions. It provides a number of alternate means for improving a child's performance and for children to develop basic skills. Children became more self-confident and self-assured in their learning.

**Reference**

Project Zero, Harvard Graduate School of Education  
321 Longfellow Hall, 13 Appian Way  
Cambridge, MA 02138  
FAX (617) 495-9709; email: [info@pz.harvard.edu](mailto:info@pz.harvard.edu)

## **Reading: Research**

Reading is a complex cognitive process in which readers construct meaning by actively using clues from the text and drawing from their prior knowledge and experiences, their purpose for reading, and the assumptions they bring from their cultural, linguistic, and historic backgrounds (Pearson et al. 1990).

Effective readers—

- integrate prior knowledge with information in the text to create meaning;
- use a variety of strategies to gain information independently;
- are internally motivated to read for information and for pleasure;
- interact socially to make gains in literacy development (Sweet 1993).

Students in BC bring to school different backgrounds, experiences, skills, intelligences, and ways to create and represent meaning. All students should have opportunities to gain an understanding of how the worldviews of people of different cultures are transmitted through storytelling, oral language, historical narratives, song, dance, and drama.

## **Early Literacy**

Most children acquire some early literacy concepts before they enter school (Clay 1975; Mason 1980; Adams 1990). They start school already somewhat familiar with letters and written words, and able to make interpretations when looking at books and listening to stories. For some children, this familiarity is not yet well-developed. The literacy concepts they have acquired at home and the literacy concepts required to participate successfully in school language instruction may be strongly mismatched (Phillips, Norris, and Mason 1996). Reading programs that are based on unexamined assumptions about the common language ability and literacy background of the children in a school may not be appropriate for all students.

Early literacy concepts—understanding about the structures, functions, and language of print that are fundamental to learning to read—include

print concepts (left-to-right, oral-to-printed word matches), letter knowledge, phonemic awareness, word recognition, and writing (Bradley and Bryant 1983; Phillips, Ball and Blachman 1991; Phillips, Norris, and Mason 1996).

Children who learn to read before Grade 3 continue to benefit from their capable reading ability. They acquire greater vocabulary, quicker recognition of words, and easier comprehension. Successful reading experiences encourage children to read more, which continues to enhance their ability to learn. Children who are not able to read fluently by the end of Grade 3 face compounded difficulties in many other areas of learning as they move through school (Stanovich 1986).

### **Early Phonological Awareness**

Research shows that phonological awareness (an awareness of the sound aspects of language, independent of meaning) is essential for reading success. Phonological awareness is critical to discovering the alphabetic principle and to understanding the alphabetic system (Snow et al. 1998).

Phonological awareness is a developmental process that occurs in the following sequence:

1. awareness of words as units;
2. awareness of syllables;
3. awareness that syllables have a beginning sound (onset) and an ending sound (rime) which includes the vowel and following consonants [e.g., C-AT, BR-ING];
4. the ability to hear the separate phonemes in words [phonemic awareness] (Trieman 1985).

The easiest and first recognized phonemes are usually initial consonants (onsets), followed by final consonants (rimes), then sounds in the middle of the word (Au, Mason, and Scheu 1995). Early phonological instruction is more effective when it occurs during the second half of the kindergarten year, following an initial period of literacy building in which children encounter a variety of experiences with oral and written language (Ayres 1998).

Early phonological awareness is developed through language play, rhyming, opportunities to notice and use letters and words, invented spelling, language experience, and rich experiences with language, environmental print, patterned stories, and “Big Books” (Braunger and Lewis 1997). For students who are considered at-risk for reading difficulties, explicit phonological awareness instruction within the context of meaningful experiences with reading and writing text has been successful in improving word identification (Torgesen et al. 1992, 1997).

Onset-rime activities are an important component of phonological awareness instruction. They—

- provide a stepping-stone in the development of phonemic awareness (Moustafa 1995);
- contribute to fluent reading because good readers read chunks of letters rather than letter by letter (Stahl and Murray 1994);
- help children learn how to figure out unknown words by making analogies with those they know (Goswami 1986, 1988; Moustafa 1995; Peterson and Haines 1998);
- help children acquire knowledge of word patterns for spelling [sometimes referred to as “word families”] (Au, Mason, and Scheu 1995; Moustafa 1995).

Instruction in phonological awareness assists children who are at-risk to develop greater word recognition ability. Effects of this instruction have not been shown to extend to gains in reading comprehension, likely due to the greater number of factors—including life experiences—that influence the ability to construct meaning from print (Snow et al. 1998). Instruction in phonological awareness can be considered “the first of many aggressive steps that can be taken in an ongoing effort to intensify all facets of reading instruction for schoolchildren who need it” (Snow et al. 1998).

Instruction in phonological awareness continues using a great variety of materials and resources through the early grades and occurs concurrent with focus on daily reading of books that are interesting and easy to read, and daily reading and rereading of books that are more difficult in vocabulary, structure, and concepts. Throughout the early grades, instruction should promote comprehension and should provide explicit focus on building strategies in areas such as summarizing, predicting, drawing inferences, and monitoring for understanding (Snow et al. 1998).

Research indicates that there is a bi-directional relationship between phonological and phonemic awareness, on the one hand, and reading and writing acquisition, on the other. Phonemic and phonological awareness contribute to and are learned through reading and writing (Ehri and Sweet 1991; Stanovich 1986). Onset-rime awareness appears to be particularly essential to early reading acquisition (Moustafa 1995; Stahl and Murray 1994). Young children who are beginning to read figure out new words by making analogies with words they know. They make these analogies at the onset-rime level rather than the phonemic level (Goswami 1986, 1988; Goswami and Mead 1992).

Writing is an important vehicle for focusing children's attention on the structure of written language (Clay 1991). Invented spelling is a particularly important strategy in developing decoding skills (Clarke 1988). It is also an effective way of assessing and monitoring children's developing phonological and phonemic awareness (Chapman 1996; Spear-Swerling, and Sternberg 1996). The use of invented spelling does not conflict with teaching conventional spelling. Conventional spelling can be developed through focused instruction and practice as children learn to spell previously studied words and patterns (Snow et al. 1998).

Teaching reading and writing together maximizes the effects of instruction; writing leads to improved reading achievement, reading leads to better writing performance, and combined instruction leads to improvements in both areas (Tierney and Shannahan 1991).

### **Shared Reading Experiences**

Readers improve in their abilities to construct meaning as they interact with others—peers and adults—in reading and discussing stories (McCormick and Mason 1986; Teale and Sulzby 1987; Morrow 1988; Jett-Simpson 1989; Mason et al. 1990; Feitelson et al. 1993). When students read to each other, the quality and complexity of their responses increase. When they read or listen to the same stories often, their interpretations become more varied and complex.

Reading aloud by the teacher, in the context of sharing experiences, ideas, and opinions, is effective in promoting listening comprehension, active use of oral language, proficiency in written language and book concepts, and greater complexity in interpretive responses (Cox and Sulzby 1984;

McCormick and Mason 1986; Dyson 1987; Teale and Sulzby 1987; Morrow 1988; Mason et al. 1990; Morrow et al 1990; Feitelson et al. 1993).

Bakhtin (1986) suggests that meaning comes into existence only when two or more voices come into contact—and the greater the depth and number of responses produced by the participants, the deeper and more substantial is their understanding. The meaning of a written text is believed to be fundamentally social rather than residing within the text, an individual, or an author (Bruffee 1986; Nystrand 1989).

### **Comprehension**

Capable readers understand what they read as it relates to their *overall* and *specific* prior knowledge—what they already know (Anderson and Pearson 1984; Paris et al. 1991; Beck et al. 1982). Overall prior knowledge is expanded continually through life experiences, including reading and writing. Specific prior knowledge about both the topic and the structure of the text is vital to constructing meaning. This knowledge is gained through guided teacher instruction (Sweet 1993).

When students read a piece of literature they respond to it by using their prior knowledge to create or construct meaning. Students develop self-monitoring skills when they are encouraged continuously to think about and respond to what they read and write. Teachers must be prepared to expect, respect, and accept a variety of student responses and accommodate them within their literacy instruction.

Encouraging students' personal responses to literature improves their ability to construct meaning. Over time, students develop more complex responses that help them become better at constructing meaning. Teachers can emphasize student knowledge and expertise in three reading phases:

- activating understanding in the prereading phase, for example, by accessing background knowledge related to the text topic;
- understanding text in the mid-reading phase, for example, by reading to discern the author's intended meaning;
- interpreting following reading, for example, by integrating information in the text with prior knowledge and clarifying on the basis of that prior experience.

## **Reading: Practice**

### *Aboriginal Language and Culture Programs*

Aboriginal language and culture programs are not intervention programs. They are intended to be culturally relevant and appropriate language programs for young Aboriginal students.

Aboriginal language and culture programs are designed to lead to knowledge, understanding, and fluency in a student's original Aboriginal language and culture, and are developed with the support and involvement of the local Aboriginal community. Experiences and activities will vary in different schools and in different communities.

## **Reference**

Aboriginal Education Initiatives  
Ministry of Education  
Victoria, BC  
Phone (250) 387-6450

### *Early Phonological Awareness (Practices)*

Phonological awareness refers to an awareness of the sound aspect of language, independent of meaning. It incorporates word and syllable awareness, awareness of speech sounds and correspondences that children need to be able to read and spell words. Studies show that children need to develop both letter knowledge and phonological awareness in Kindergarten and early in Grade 1 to help them make sense of reading and to contribute to improved reading development. Instruction to develop phonological awareness should be engaging, meaningful, and developmentally appropriate.

Children should finish Kindergarten familiar with the form and formats of books and should be able to recognize and write most of the alphabet. They should have some understanding of how spoken words are made up of smaller sounds. Children should also be motivated to be readers and to be successful learners (Snow et al. 1998).

Effective practices to promote early phonological awareness include the following:

- Read aloud to children and share books, repeatedly. Encourage children to ask questions and to answer each others' questions about stories. These activities enable children to develop an understanding of the language of books and print. They also motivate students to appreciate books and to learn to read independently.
- Provide many books that are easily accessible by young children, including Big Books and patterned or predictable books. Read these books again and again, to enhance children's learning and motivation.
- Read and talk about many books from different genres (e.g., storybooks, informational texts, picture books). This provides variation in focus and the types of activities in which children engage. Using different genres also provides opportunities for differing levels of complexity of vocabulary and discussion.
- In order to direct children to the sounds in spoken words, use many and varied oral language experiences including rhyming and alliteration, chants, poems, songs, identifying words that begin or end with the same sound, clapping the number of syllables in a word, and other similar activities.
- Encourage children to notice the form, structure, and function of different print features such as words, letters, and punctuation.
- Provide dramatic play and oral language activities, using children's own dramatizations.
- Write down and read accounts of children's experiences. Use captions and labels on pictures that children draw. Guide children to recognize the print that is in their environment and explicitly clarify children's understanding of words and print.
- Encourage children to compose and write, and to spell words the way they sound. Provide materials for writing, including paper, markers, and pencils.

Instruction in phonological awareness can help children attain automatic, visual recognition of spelling patterns within words. This can then lead to automatic word recognition and identification. Instruction in phonological awareness should be embedded in meaningful reading and writing activities.

As children move through the primary grades, they should continue daily reading of books that they are able to read independently as well as books that are challenging and more difficult. They should be actively developing a range of comprehension strategies, such as summarizing, predicting, and monitoring their own comprehension.

### **Reference**

Snow, C. E., Burns, M. S., and Griffin, P. (eds.). 1998. *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.

### *Family Literacy Programs*

One of the key predictors of a child's ability to read capably and succeed in school is the mother's education level. Family literacy programs focus on enhancing the literacy abilities of parents and encouraging them to read daily to their children. As family literacy is key to providing a rich literacy environment for children, these two emphases complement each other and form a strong basis for future learning for both parents and children.

Family literacy programs are usually developed within the local community to meet the needs of parents and children. Each community is unique in its specific literacy needs, but all share common concerns and needs for information. Programs often emerge from comprehensive needs assessments to consider what is important and motivating for parents and children. Two examples of plans and programs for family and community-based literacy development are, *Families in Motion: A Success Story* and *Letters to Aunt Mabel: Thoughts and Plans for Literacy Development*. These programs are two of a number of cost-shared projects supported by Literacy BC.

*Families in Motion*, developed by six community partners and the University College of the Fraser Valley, describes the four-year development of a Family Literacy project and the collaboration among the various members of the community. The handbook and video include information about planning the program, developing the pilot project, fundraising, partnerships, and expanding the program.

*Letters to Aunt Mabel: Thoughts and Plans for Literacy Development* developed by Learners Opportunity Group and Northwest Community College in Hazelton explains a range of issues related to developing literacy programs from a community perspective. The document focuses on topics such as Literacy Problems, Literacy and Orality, Causes of Literacy Problems, The Experience of Learning, The Experience of Teaching, and Community Planning. It incorporates a focus on First Nations literacy issues and includes a Community Action Plan.

### **References**

Literacy BC and the National Literacy Secretariat have funded these and a number of other literacy programs.

Literacy BC Phone: 1-800 663-1293

National Literacy Secretariat Phone: 1-819 953-5280

### *Holistic Early Literacy Program*

The *Holistic Early Literacy Program* uses shared reading and writing experiences as a basis for learning experiences and teacher-student interactions for Grade 1 students at risk for reading difficulties. Individual sessions take place twice a week for 30 minutes each, over five months.

Instruction includes shared reading with predictable books and shared writing using the language experience approach. Instruction focuses on helping children increase literacy development, and is specific to the individual needs of each child. Children learn to make meaningful predictions, internalize language structures, and increase attention to print cues. Using stories based on their experiences encourages children to write to communicate ideas and to see the links between oral and written language.

In each session, children reread at least one familiar predictable book, are read to and read a new predictable book, reread a familiar language experience story, and dictate and read a new language experience story. The children choose books to take home each night and go to the library once a week. They have a quiet reading time for 20 minutes each day and they write in daily journals about books they have listened to or read. Key factors in the program include the following:

- collaboration between the program teacher and the classroom teacher;

- classroom settings that reflect the principles of whole language instruction;
- development of literacy concepts congruent with those of the classroom;
- a foundation in what children already know;
- holistic experiences with literacy to allow children to make sense of reading and writing;
- a strong focus on oral language;
- skills developed within the context of real reading;
- literacy viewed as a social and academic activity.

### **Reference**

Department of Elementary Education, University of Alberta, 551  
Education Centre South, Edmonton, AB T6G 2G5; Phone (403) 492-4273,  
FAX (403) 492-7622

### *Project CRISS*

Project CRISS (Creating Independence through Student-owned Strategies) is designed to help students organize, understand, and remember information. It was developed in the Kalispell, Montana School District and has been used in both reading and mathematics contexts. It has been validated for students in Grades 10 through 12.

The program focuses on seven areas: Principles and Philosophy, Textbook Analysis, Discussion Strategies, Active Strategies for Learning and Organizing, Writing Strategies, Vocabulary, Assessment. It contains materials and examples appropriate for Science, English, Mathematics, and Social Studies.

Teachers model and teach the use of a range of strategies for learning. A workshop and training manual is available for inservice. Training requires a 12-18 hour workshop over 2-3 days, and includes an introduction to the theoretical foundation and work sessions for each of the program's seven components.

## **Reference**

Project CRISS  
233 First Avenue East  
Kalispell, Montana 59901  
Phone (406) 756-5011; FAX (406) 756-4510

### *Reading Recovery*

*Reading Recovery* is an early intervention program to help low-achieving Grade 1 students learn to read and write. There are three main components: observation survey, tutoring session, and teacher training. Students learn how to read for meaning, self-monitor and self-correct their reading and writing, hear and record sounds in words, and create and represent meaning. The teacher meets with each student in individual sessions. The tutoring session includes reading known stories, reading a story that was read the previous day, writing a story, working with a cut-up sentence or story, and reading a new book. The teacher observes and records what the child is doing and the observations become the basis for the next lesson.

Children who are the lowest achieving readers in Grade 1 are selected to receive 30 minutes a day one-to-one instruction for a period of up to 20 weeks. Teachers focus on the student's strengths and provide instruction in strategies that will help students become independent readers.

The intent of the program is to provide a strong foundation in reading early on, ensuring that students who would have faced problems due to literacy difficulties will be able to succeed. Studies have shown that children who complete the *Reading Recovery* program continue to make progress within the regular classroom and in independent reading situations. Researchers (Gaffney 1991; Opitz 1991) have indicated that the program works because—

- the program is based on a reading theory that emphasizes meaning;
- assessment and evaluation are integral to the program;
- children learn reading strategies in the context of connected text;
- teachers use effective teaching strategies;
- the teacher-student dialogue is key to helping students learn complex tasks, such as reading.

Teachers are trained in Reading Recovery procedures and in the theories and practices of effective reading instruction. The training integrates theory and practice and incorporates intensive interaction with colleagues.

### **References**

Canadian Institute of Reading Recovery  
University of Toronto, Scarborough  
1265 Military Trail, Scarborough, ON M1C 1A4  
Phone (416) 396-6322; FAX (416) 396-6324

Western Institute of Reading Recovery  
1970 Ness Avenue  
Winnipeg, Manitoba R3J 0Y9

Lyons, C. A. et al. 1993. *Partners in Learning: Teachers and Children in Reading Recovery*. New York: Teachers College.

### *Shared Learnings*

*Shared Learnings: Integrating BC Aboriginal Content K-10* is designed to provide teachers with guidance in integrating Aboriginal topics in all subject areas at an introductory level. The aim is to provide a guide for educators to assist in creating a greater sensitivity to and respect for the richness and diversity of the Aboriginal peoples of British Columbia. The resource has been developed to encourage the support and participation of the local Aboriginal communities.

It is based on the following premises:

- Aboriginal peoples have strong, dynamic, evolving cultures that have adapted to changing world events.
- Aboriginal peoples' values and beliefs are strong, durable, and relevant.
- To understand Aboriginal issues, it is necessary to understand and appreciate that all contemporary events have their roots in history.
- Language is the base of culture. Aboriginal cultures and languages have an important place in society.

Integration of authentic Aboriginal content into the BC K-10 curriculum, with the support of Aboriginal peoples, will help to promote understanding of BC Aboriginal peoples among all students and give Aboriginal students a sense of place and belonging in the school system.

### **Reference**

Aboriginal Education Initiatives  
Ministry of Education  
Victoria, BC  
Phone (250) 387-6450

### *Success For All*

*Success for All* is a school-based achievement-oriented program for students in pre-K through Grade 5. This program is designed to prevent or intervene in the development of learning problems in the early years by effectively organizing instructional and family support resources within the regular classroom. In particular, the goal is to ensure that virtually every student will finish Grade 3 with grade-level reading skills. A corollary of *Success for All* is that no student will be left to “fall between the cracks” on the path to acquiring good reading skills (Balkcom and Himmerfarb 1993).

A half-day preschool program is provided for all children to enhance their development of language skills, school readiness, and a positive self-concept. A full-day kindergarten program continues the emphasis on language, using children’s literature, and thematically related activities. Oral and written composition, conceptual development in print and mathematics, and alphabet games are also included. Peabody Language Development Kits and the program Story Telling and Retelling (STaR), in which students retell stories read by teachers, are used to provide additional experience in language.

In Kindergarten through Grade 1, language skills development, auditory discrimination, and sound blending are emphasized, and phonetically regular minibooks are used for paired reading exercises.

In Grade 2 through Grade 5, students use school- or district-selected reading materials and trade books. Students engage in partner reading and gain experience in summarizing stories; identifying characters,

settings, and problem solutions of narratives; writing; and reading comprehension skills. Teachers use a form of cooperative learning to develop reading skills based on the Cooperative Integrated Reading and Composition (CIRC) program.

Students are assessed every eight weeks to determine the adequacy of their progress in reading. This information is used to assign students to tutoring, to suggest alternative teaching strategies in the regular classroom, and to make changes in reading group placement, family support interventions, or other means of meeting students' needs.

The family support team works with parents to ensure their children's success. The team focuses on promoting parent involvement, developing plans to meet the needs of individual students who are having difficulty, implementing attendance plans, and integrating community and school resources.

A full-time facilitator works with teachers in each *Success for All* school to help implement the reading program. The facilitator coordinates the eight-week assessments, assists the family support team, facilitates staff support teams, plans and implements staff development, and helps all teachers and tutors ensure that every child is making adequate progress.

Specially trained certified teachers work individually with all students in Grades 1 through 3 who are not yet reading at grade level. Every effort is made to address a student's learning problems within the regular classroom, supplemented with tutoring.

Teachers and tutors receive three days of inservice training and detailed manuals at the beginning of each school year, and extensive classroom follow-up throughout the year. For Grades 1 through 3, the training is focused on implementation of the reading program. Preschool and kindergarten teachers and aides are trained in the use of STaR and Peabody Programs and in other aspects of the preschool/kindergarten models.

## **Reference**

Madden, N. A. et al. 1992. *Success for all: A relentless approach to prevention and early intervention in elementary schools*. Arlington, VA: Educational Research Service.

Madden, N. A. et al. 1993. Success for all: Longitudinal effects of a restructuring program for inner-city elementary schools. *American Educational Research Journal*, 30, 123-148.

## **Mathematics: Research**

A primary goal of mathematics instruction is mathematics literacy. The same theories of cognition and learning that underlie how children learn to read and comprehend written works are evident in how children become capable in complex mathematical problem-solving.

Mathematical literacy requires the interactive and dynamic use of three types of mathematical knowledge (Goldman et al. 1997):

- Declarative knowledge—knowledge of facts about mathematics which, once learned, are retrieved quickly, easily, and fluently and can be used without error.
- Procedural knowledge—knowledge of rules, algorithms, and procedures which act as instructions in how to complete tasks.
- Conceptual knowledge—the ability to see the interconnected relationships between information and data; the ability to understanding relationships is critical.

Standards developed by the National Council of Teachers of Mathematics imply that children need to participate actively and construct meaning from what they are learning (Goldman et al. 1997). Numeracy develops within a meaningful social context. It is enriched when students take part in realistic, multifaceted problems. Mathematics instruction should embed skill development within relevant and meaningful problem situations.

Instruction for mathematical literacy emphasizes complex, open-ended problem solving, communication, and reasoning. Successful programs are those which embed skills within multifaceted, realistic, meaningful situations. These situations require strong engagement on the part of learners and often require the efforts of students working in groups to bring multiple perspectives to bear on the problems.

Effective mathematics instruction provides students with strategies for understanding and learning independently. As with literacy, students bring prior knowledge and understanding to problems, organize information, determine the specific meaning of new vocabulary, and create a new understanding from problem situations.

Effective teachers provide opportunities for students to tap into what they already know and set a purpose for what they want to learn. They ensure that students are actively involved in learning. They guide students in effective ways to identify, organize, and record pertinent information and they help students understand and reflect on how they learn.

### **Mathematics: Practice**

#### *The Adventures of Jasper Woodbury*

*The Adventures of Jasper Woodbury* was developed at the Learning Technology Center of Vanderbilt University. It includes 12 videodisc or CD-ROM based adventures focusing on finding, formulating, and solving mathematical problems, and is designed for students in Grades 5 and up. Each video is a narrative that concludes with a challenge in the form of a problem. It uses an anchored instruction approach, which involves creating a meaningful context for solving authentic problems. The problems are complex and often necessitate groups working together to bring multiple perspectives to bear.

### **Reference**

Learning Technology Center  
Box 45 Peabody  
Vanderbilt University  
Nashville, TN 37203

#### *Maneuvers With Mathematics*

The *Maneuvers with Mathematics* program provides hands-on, problem solving activities for students in Grades 5 through 8. It makes strong use of scientific calculators and manipulatives. Each module provides a set of investigations, problems, and learning activities. Students solve problems, make conjectures, reason, and investigate mathematical relationships and connections.

Students discuss their observations, their ideas, and their thinking with each other and the instructor as they work.

**Reference**

University of Illinois at Chicago  
851 S. Morgan Street, SEO 1309  
Chicago, IL 60607-7045  
Phone (312) 996-8708

*University of Chicago School Mathematics Project (Chicago Math)*

The Chicago Math Program promotes the ability to think and communicate mathematically. It focuses on problem solving and encourages enthusiasm for mathematics. Children at the primary level learn basic math facts so they can use them easily, automatically, and fluently. This knowledge is as essential to numeracy as phonological awareness is to literacy.

The Chicago Math Program uses realistic situations that emerge from students' interests to introduce and develop key mathematical concepts early in the school years. The program continues through the grades, helping students to see the role of mathematics in daily life and to be able to use mathematics effectively. The program is aimed at ensuring that students graduate from secondary school with mathematical learning beyond algebra.

**Reference**

University of Chicago School Mathematics Project  
5835 S. Kimbark Avenue, Judd Hall  
Chicago, IL 60637  
Phone: (312) 702-9770; FAX (312) 702-0248

## **Social and Emotional Development: Research**

A comprehensive and well-coordinated school-wide program to promote social and emotional learning benefits all children (Elias et al. 1997). Children engage in social and emotional learning in much the same way they become proficient in literacy and numeracy. A successful program includes—

- effective, developmentally appropriate, formal and informal instruction in social and emotional skills throughout the school years;
- a supportive and safe school climate;
- committed and active teachers, administrators, parents, and community members who take responsibility for creating opportunities for learning before, during, and after the school day.

Interventions include directly teaching social and behavioural skills and providing opportunities for practice and generalization. Studies indicate that positive, school-wide initiatives that emphasize pro-social behaviour and preventing problem behaviour are more successful than traditional programs that emphasize negative consequences. Successful programs are integrated into the academic teaching of the school and have clear outcomes that are defined as broad school goals, as well as individual student goals.

When a combination of circumstances—prenatal conditions, disabilities, economic circumstances, quality of health and nutrition, family and home situations, and/or lack of traditional support systems—puts obstacles in their way, students may have significant difficulties in their ability to focus on learning. Resulting school failure often leads to a sense of alienation and discouragement, and many students may then be at risk for leaving school early.

Studies indicate that early intervention is critical for students who are at risk for school failure. A number of longitudinal studies confirm that high quality preschool programs for children at risk can help prevent school failure and failure in key aspects of adult life. Two programs—the High/Scope Perry Preschool Project and the Head Start Program—have validated long-term evidence showing the success of participants through school and into adulthood. Specifically, these programs—

- improve children's intellectual performance when they start school;
- reduce the need for children to be placed in special education programs or to repeat grade levels because they are unable to do the work expected of them;
- lead to a much lower high school dropout rate among participants.

Luster (1996) considered which factors, other than preschool, contributed to success for young children. He examined characteristics of children when they began school and characteristics of their families. He concluded that the positive roles that families play in the development of their children has been largely overlooked by researchers. Much research has focused on the problems, dysfunction, and failures of families of children of poverty. The focus on failure very likely contributes to the marginalization that many families feel when they are struggling to cope with multiple challenges and they are chastised by schools for not doing enough for their children.

Luster found that parents may affect their children's educational outcomes more by what they do in the home than by the amount of time they spend in the school. He found that parents who place a high value on education and have high expectations for their children tended to have children who attained higher levels of education. Stronger school-family links are an outcome of a number of early intervention strategies that emphasize parent/social support and cognitive/verbal ability.

### **Social and Emotional Development: Practice**

#### *Aboriginal Support Services*

The goal of the position of Aboriginal Support Worker is to assist Aboriginal students to achieve greater success in all school programs. Aboriginal Support Workers bring to their positions life experiences and knowledge of cultures, values, beliefs, history, and traditions.

Responsibilities and positions vary from school to school, community to community, and also over time. The primary responsibility is to provide support and promote cultural growth for Aboriginal students by combining the needs of the student and his or her community with an understanding of the school system. Aboriginal Support Workers

maintain ongoing communication with students, parents/guardians, educators, and community agencies, and support people. They are role models and liaisons and advocates for Aboriginal students and parents.

**Reference**

Aboriginal Education Initiatives  
Ministry of Education  
Victoria, BC  
Phone (250) 387-6450

*Circle of Courage*

The *Circle of Courage* is the focus promoted by Brendtro, Brokenleg, and Van Bockern in *Reclaiming Youth At Risk: Our Hope for the Future*. It outlines four basic components as essential for students to develop a sense of their own value and strength: a sense of belonging, mastery, independence, and generosity.

Brendtro et al. review the factors in a person's life that can lead to a sense of isolation, lack of motivation, irresponsibility, and anti-social behaviour. They discuss the reclaiming environment needed to nourish a student's sense of belonging without neglecting the need for autonomy. They acknowledge the need for students to make independent decisions, while respecting the wisdom and advice of adults. They assert that achievement and mastery lead to acts of service. Within this balanced vision, the circle is complete.

Developing the environment to support the Circle of Courage within a school requires a long-term commitment to the principles underlying a reclaiming environment. These include—

- understanding the importance of positive relationships in the lives of people and knowing how to foster these within the school;
- understanding how people learn and organizing instruction to foster achievement and mastery;
- understanding how people develop a strong sense of social responsibility and self-discipline and applying this understanding to school and community experiences.

## **Reference**

Brendtro, L. K., Brokenleg, M., and Van Bockern, S. 1990. *Reclaiming youth at risk: Our hope for the future*. Bloomington, IN: National Education Service.

### *Effective Behaviour Support (EBS)*

Effective Behaviour Support (EBS) is a systems approach to enhancing the capacity of schools to educate all students, including those with challenging social behaviours. It is a positive, proactive school-based intervention plan to improve student behaviour and enhance learning in positive class and school environments.

EBS is grounded in an instructional approach to social and behavioural skills which includes teaching appropriate behaviour by demonstration and modeling, and directed practice of effective behaviours. It emphasizes pre-correction rather than punishment and includes arranging opportunities for students to practice appropriate behaviour in a natural context with positive feedback.

A school team collaborates on how the school climate can be enhanced to improve overall student behaviour and to support students to develop positive social skills. EBS requires a commitment to active and long-term participation. It integrates the teaching of social and behavioural skills into the academic programming of the school. The assumption is that schools in which there is universal group behaviour instruction and support will provide increased student and teacher time and energy for academic learning and will free up needed resources for specialized behaviour support for students with at-risk behaviours.

Instruction in appropriate positive behaviours helps children attain effective social behaviour patterns which can enhance their overall success in school. Instruction in social skills are embedded in instructional activities.

Children who are at risk for problem behaviours require more focused instruction in social skills to benefit from classroom instruction and to function effectively both in the school and in the community.

**Reference/Contact**

Contact: BC CASE, Rod Johnston, President, Kootenay Lake School  
District #8.

Lewis, T. J. 1995. *Decision Making about Effective Behavioral Support: A Guide for Educators*. Eugene, OR: National Center to Improve the Tools of Educators.

## **APPENDIX A: SCHOOL DISTRICT CONTACTS**

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Many school districts have well-established intervention programs to support students experiencing difficulties in key areas of learning. Others are in early stages of planning. *Starting Points: A Research Summary for Schools Planning Intervention Programs* is one step in the Ministry of Education's plans to support school districts who are planning intervention programs.

The Ministry of Education is establishing a provincial network of school district contacts. If you wish to become part of this network, please complete this sheet and send it by fax to—

Elaine McNeary  
Program Standards and Education Resources Branch  
Ministry of Education  
Phone: (250) 356-2303  
FAX: (250) 356-2316

Name/Position: \_\_\_\_\_

School District: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Phone/FAX: \_\_\_\_\_

Email: \_\_\_\_\_

Summary of current district intervention initiatives:

## **APPENDIX B: NETWORKS AND WEBSITES**

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The following are samples of websites and networks that focus on reading and mathematics:

### **Reading**

Center for the Improvement of Early Reading Achievement (CIERA):

<http://www.ciera.org>

The Center's mission is to improve children's reading achievement by generating and disseminating theoretical, empirical, and practical solutions to persistent problems in the learning and teaching of beginning reading. The organization has developed a series of pamphlets summarizing current research in reading education: *Every Child A Reader*. Ordering information is available on the website.

Checkpoints for Progress in Reading and Writing for Teachers and Learning Partners: <http://www.ed.gov/pubs/CheckTeachers/>

This website is part of the America Reads! website and provides the Table of Contents and links to checkpoints in reading and writing for children from birth through Grade 12.

The Children's Literature Website:

<http://www.ucalgary.ca/~dkbrown/index.html>

This website gathers together, categorizes, and links a wide range of Internet resources related to books for children and young adults.

Early Literacy Network: <http://ted.educ.sfu.ca/earlyliteracy/earlyliteracyblue.html>

The Early Literacy Network is a network of people who have data and classroom expertise using and implementing early reading intervention in BC.

Eric Clearinghouse on Reading, English, and Communication:

[http://www.indiana.edu/~eric\\_rec/](http://www.indiana.edu/~eric_rec/)

This website provides information about educational materials, services, and coursework to those interested in the language arts.

NCITE Research Synthesis: Reading and Diverse Learners:

<http://darkwing.uoregon.edu/~ncite/reading/reading.html>

The National Center to Improve the Tools of Educators (NCITE) is funded by the U.S. Office of Special Education Programs. NCITE has compiled a synthesis of recent research on the optimum methods of teaching beginning reading. The synthesis reviews studies conducted during the past eight years and presents key elements necessary to designing reading curricula for diverse learners.

## **Mathematics**

Eisenhower National Clearinghouse for Mathematics and Science Education: NCTM Standards for School Mathematics, Table of Contents:

<http://www.enc.org/reform/journals/ENC2280/280dtoc1.htm>

This Clearinghouse website presents the curriculum standards for Mathematics, Grades K–12, developed by the National Council of Teachers of Mathematics. It also provides links to the Table of Contents for Implementing the NCTM Standards for School Mathematics.

The Math Forum: <http://forum.swarthmore.edu/>

The Math forum is an online Math Education Community Center, funded by the National Science Foundation. It provides a range of resources, including a Quick Reference Sheet of interesting topics, lessons, software, and activities.

National Council of Teachers of Mathematics: <http://nctm.org>

The NCTM is the primary professional organization for teachers of mathematics in grades K–12. It has developed a set of standards for school mathematics that address content, teaching, and assessment and are appropriate for use in planning, implementing, and evaluating mathematics programs in K–12. This website has a link to information about the Standards 2000 Project.

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## CONTENTS

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Introduction .....	1
Features of Effective Intervention.....	2
Effective Early Childhood Intervention.....	2
Effective Reading Intervention.....	2
Effective Mathematics Intervention.....	3
Effective Social and Emotional Intervention.....	4
Overview of Interventions .....	5
Early Education .....	5
Reading.....	8
Mathematics.....	13
Social and Emotional Development .....	15
Research and Practice .....	17
Early Childhood: Research .....	17
Early Childhood: Practice .....	18
Aboriginal Head Start Program .....	18
Building Blocks.....	19
Community Action Program for Children (CAPC) .....	20
Full Day Kindergarten.....	20
High/Scope Perry Preschool Project.....	21
Project Spectrum.....	22
Reading: Research.....	24
Reading: Practice .....	29
Aboriginal Language and Culture Programs.....	29
Early Phonological Awareness (Practices).....	29
Family Literacy Programs.....	31
Holistic Early Literacy Program.....	32
Project CRISS.....	33
Reading Recovery.....	34
Shared Learnings.....	35
Success For All.....	36

Mathematics: Research.....	39
Mathematics: Practice.....	40
The Adventures of Jasper Woodbury .....	40
Maneuvers With Mathematics .....	40
Chicago Math.....	41
Social and Emotional Development: Research .....	42
Social and Emotional Development: Practice .....	43
Aboriginal Support Services .....	43
Circle of Courage .....	44
Effective Behaviour Support (EBS).....	45
Appendix A: School District Contacts .....	47
Appendix B: Networks and Websites.....	48
Appendix C: References.....	50
Appendix D: Related Professional Books.....	57