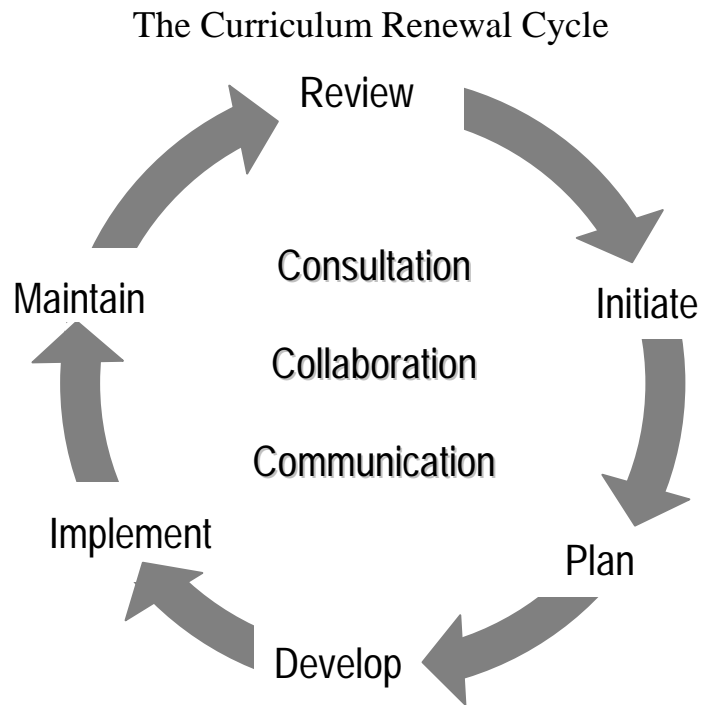


## Elementary Science: Program and Resource Review

Curriculum review and renewal are major undertakings involving many people. Consultation with clients, partners and stakeholders is an integral component of the curriculum renewal cycle. To ensure that the needs of students continue to be met, programs of study and accompanying learning and teaching resources are reviewed periodically. This review process provides direction to the steps that follow in renewal of the program in both the English and French languages. In preparation for the next cycle of renewal, a review of the elementary science program was conducted during the 2005-2006 school year.

The curriculum renewal cycle is shown graphically below. Consultation and collaboration with classroom teachers is a critical component of the curriculum renewal process.



### Background

#### Current Program

The currently authorized Alberta elementary (grades 1 to 6) science program of studies was implemented in 1996, following a needs assessment and three years of program development. Implementation of the program represented a major shift in structure from the previous program that had been implemented in 1983. The current program contains five topics per grade level, with general and specific learner expectations identified for each topic. The themes of science inquiry and problem solving provide contexts for the science content in each grade.

## **Learning and Teaching Resources**

Implementation of the current program was assisted by student support learning resources and authorized teaching resources. The bulk of the student support resources were in the form of single-topic books that address a portion of a topic. The bulk of the authorized teaching resources were wider in scope, with many providing coverage of a full topic and others providing background related to particular methodologies. Almost half of the approximately 250 resources that were initially authorized are now out of print. However, some additions to the resource list have been made since the initial authorizations, mostly in the form of video and single-topic student resource supplements.

## **Pan-Canadian Science Framework**

During the latter stages of development of the current Alberta elementary (grades 1 to 6) science program of studies, the Council of Ministers of Education, Canada (CMEC) initiated the Pan-Canadian Protocol for Collaboration on School Curriculum, resulting in development of the *Common Framework of Science Learning Outcomes K to 12: Pan-Canadian Protocol for Collaboration on School Curriculum* (1997). An analysis of the alignment between the Alberta program and the Pan-Canadian framework was conducted shortly after release of the framework. Through this analysis, the Alberta program and the Pan-Canadian framework were found to be comparable in scope. However, an analysis by grade showed less alignment of the knowledge dimension in the two documents. Canadian developers of learning and teaching resources for elementary science are increasingly aligning their products with the Pan-Canadian framework.

## **Program Review**

The following is a summary of findings from the review of the elementary science program conducted during the 2005–2006 school year. This summary identifies the major themes that emerged. Two principal consultation processes were used in seeking input. An *Elementary Science Needs Assessment Questionnaire* was posted on the Alberta Education Web site for all teachers in the province to provide input. Regional focus groups were also held to provide further depth to the review and to create opportunities for open discussion. Regional focus group meetings were held in Edmonton, Red Deer, Calgary, Medicine Hat and Fort McMurray, as well as at the Alberta Teachers' Association Science Convention. Focus group participants included teachers providing science instruction in French and English; curriculum leaders; administrators; and representatives from non-government organizations, industry and post-secondary institutions.

General questions brought forward during this consultation process included:

- What are the strengths and limitations of Alberta's currently authorized elementary science program?
- What are the strengths and limitations of currently authorized learning and teaching resources?
- What are the needs and opportunities for change?

In summary, respondents indicated the following:

- Students are interested in and enjoy their experiences with elementary science. The program provides good opportunity to explore and investigate.
- The concepts and skills covered in the current elementary science program of studies are generally appropriate at the grade levels at which they are placed. Respondents noted some topics that might be reassigned one grade earlier or later, and they identified a few outcomes that may be too theoretical for the elementary level. Some teachers suggested that outcomes be expressed more clearly by using examples.
- The scope of content at each grade was seen as about right by some teachers and as too broad by others. About half of the teachers suggested that the number of topics at each grade be reduced from five to four.
- The possibility of increasing the alignment of the Alberta program with the Pan-Canadian framework was seen to provide interesting opportunities for change, but respondents also noted that the current Alberta program has strengths that should be maintained. Respondents generally supported the approach of seeking a best blend of the two.
- An increased focus on personal, social and environmental contexts is seen as desirable. The approach taken in the Pan-Canadian framework was seen as appropriate.
- Current learning and teaching resources are not adequate and/or appropriate. This concern was particularly evident for French-language resources, which lack print, audio and digital materials.
- Teachers noted that the inquiry and skills dimension of the program, particularly in the French-language program, is important but is not well supported by resources. They also noted that they were often unable to obtain appropriate hands-on materials for activities and that the amount of time required to gather and prepare materials is limiting.
- Teachers recommended that a core teacher resource be custom-developed for Alberta. They also put priority on selection/development of student basic resources at each level, although many teachers also requested a variety of topic-specific resources.
- Teachers noted that the program should meet the needs of all students and that it should be responsive to the children's previous experiences.
- Teachers suggested that support for implementation and provision of professional development activities would enhance the program in general and would provide support for teachers who do not have a science background.

## **General Directions for Change**

General directions for change, based largely on input received during the program review, include the following:

- Provide more room to develop skills and concepts in depth by reducing the overall scope of the program; e.g., consider four topics of study at each grade rather than five.
- Improve alignment with the Pan-Canadian framework.
- Infuse Information and Communication Technology (ICT) outcomes into the program.
- Infuse First Nations, Métis and Inuit (FNMI) perspectives into the program.

- Support connected and integrative learning, and provide opportunities to apply and extend learning in other program areas:
  - Broaden science–technology connections to include society in order to enhance relevance of learning for students, particularly at Division 2.
  - Improve connections among related concepts and with other program areas, such as language arts, mathematics and social studies, by providing themes or concept strands.
  - Consider how the elementary science program can support other parts of the elementary program, such as infusing ICT outcomes and FNMI perspectives.
- Support a provincial literacy and numeracy strategy.
- Include learning outcomes for students in Kindergarten.
- Initiate calls for resources or calls for proposals that will lead to the development of student basic resources and authorized teaching resources for science, in both French and English, that have a strong curriculum fit to the program at each grade.
- Ensure that the skills dimension of the program is well supported through both French-language and English-language resources.
- Identify support resources that provide additional contexts for learning and additional approaches to learning; e.g., resources supporting FNMI perspectives and ICT outcomes, digital resources and digital resource links.
- Provide an online guide to implementation to complement publisher-developed resources.
- Provide implementation support by working with the Alberta Regional Professional Development Consortia (ARPDC) and school jurisdictions to identify professional development activities that focus on science inquiry; science, technology and society (STS) connections; and general patterns of science learning and instruction.