

Figure 1 : Model for teaching Science and Technology and Social Universe while integrating Indigenous cultural knowledge.

mobilize Indigenous cultural knowledge, including an approach linking Science and Technology with Social Universe.

In this model, the proposed method (yellow circles) shows that the links to be established between school subjects are not limited to content, but also include approaches. Whether in Science and Technology or in Social Universe, remember that the goal is not to acquire knowledge, but to engage students in approaches allowing them to build their knowledge - which is consistent with learning models based on observation and experience. Therefore we suggest, for Science and Technology and Social Universe education, a common approach (Couture and Duquette, 2017), which starts from a problem to be solved, to make way for observation and contextualization, including comparisons and analyzes, to find solutions that contribute to knowledge construction. This approach, deployed to explore a living environment, a territory, lifestyles, traditions, tools, objects and techniques, make it possible to integrate not only knowledge,

but also ways of learning that are in line with Indigenous culture. Furthermore, the approach promotes a holistic work of the different themes, since, for them to be fully understood, the student must work from both their scientific and social aspects. For example, "tools" can be addressed on the technology side, in terms of their production, and on the social universe side, in terms of their use in society. Entering through this process is therefore a first step towards promoting Indigenous culture in teaching Science and Technology and Social Universe.

Once established, this intention to explore the living environment, the territory, lifestyles, traditions, tools, objects and techniques with a common approach requires a connection work with the Training Program (MELS, 2009). To do this, we have chosen integrative themes making it possible to address prescribed learning in Science and Technology and in Social Universe for the elementary level. These integrative themes are as follows:



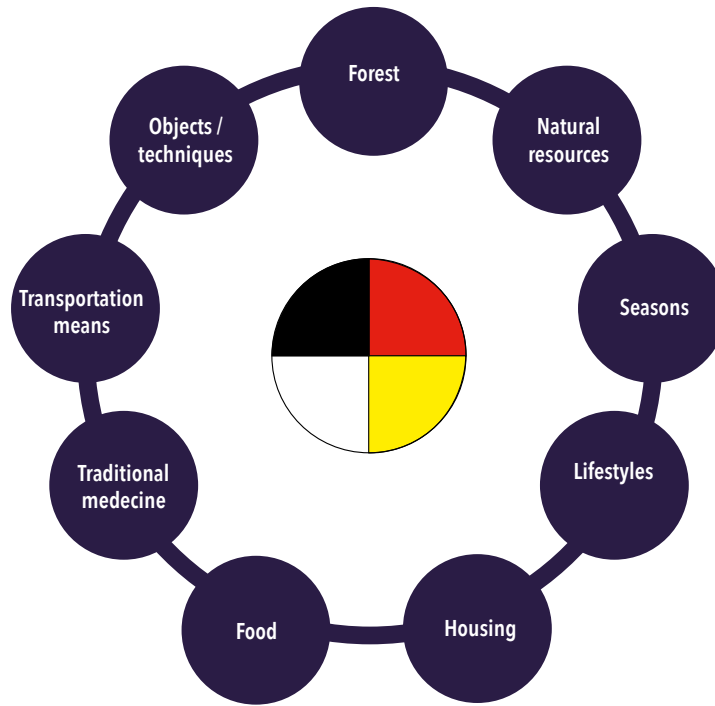


Figure 2 : Integrative Themes

In that respect, the forest, natural resources, seasons, lifestyles, housing, food, traditional medicine, transportation means, objects and techniques are all themes that make it possible to work on prescribed learning in Science and Technology and Social Universe (MELS, 2009), since they mobilize Indigenous cultural knowledge and a holistic approach. Examples such as the birch tree, the moose and the territory can be studied in the perspective of these different integrative themes to work on the learning targeted by the program. This connection of concrete examples, with integrating themes and targeted learning, is the second step that we suggest to integrate Indigenous cultural knowledge into the teaching of Science and Technology and Social Universe.

The example of the birch tree

To illustrate the connection between a concrete example and the learning progression (MELS, 2009), using integrative themes, let us examine the example of the birch tree which, because of its presence in our forests and the use made of it by First Peoples, connects several elements of Science and Technology and Social Universe.

From this analysis, it becomes easy to imagine different learning situations that may or may not be integrated into an interdisciplinary project. For example, it would be possible to make a canoe model in science and technology, while exploring the means of transportation and lifestyles at different times, but also the geography of the territory and the community migration during the seasons. Such an analysis makes it possible to

The birch tree	Science and Technology	Social Universe
Present in our forests	Human beings and their environment	Strengths and constraints of the territory
Fewer mature birch trees than before	Human beings and their environment	Use of the territory from yesterday to today
The bark is harvested at the change of seasons	Seasons	Strengths and constraints related to the climate
Housing, tools, means of transport, traditional medicine	Objects/techniques	Transportation means Lifestyles
Tents (cover)	Objects/techniques	Housing
Birch water contains minerals	Energy - dietary requirements	Elements of everyday life food
Herbal tea to relieve diarrhea and hemorrhages	Material - transformation	Cultural reality
Canoe production	Objects/techniques	Transportation means
Drums, snowshoes, tool handles, baskets	Objects/techniques	Expressions of art Elements of everyday life



integrate Indigenous cultural knowledge into the teaching of Science and Technology and Social Universe, without adding work, since the targeted learning is treated using examples that are part of the teacher's choice.

By addressing these examples using the proposed approach, it is also possible to integrate learning models based on observation and experience—for instance, by leaving the classroom to promote learning. Let us take again the example of birch trees. During forest outings, children can observe birch trees grow, tree features, the tropism associated with them, and other elements of the science and technology program. At the same time, students can question the influence of birch trees in their culture by determining how they were used in the past (canoe construction, housing, etc.), attempting to reproduce or model these uses (build a canoe model with bark found in the forest) and finally, define their use in today's society. This way, they develop the learning targeted by the Social Universe program while continuing the work in Science and Technology. In short, this approach gives greater flexibility to the teacher who can implement activities meeting the learning requirements while promoting Indigenous cultural knowledge.

As an extension

The model we have developed, to help students integrate Indigenous cultural knowledge into Science and Technology and Social Universe, could also help teachers to see how, based on examples from Indigenous culture, they can work on the learning targeted by the program. With this model, which proposes to integrate not only Indigenous knowledge, but also an approach based on observations and experiences, we encourage teachers to foster active learning of Science and Technology and Social Universe, establishing complementary connections between these two school subjects. This has the advantage of promoting a holistic vision of school content, a vision that resonates well with the characteristics of Indigenous cultural knowledge and lifelong learning. We believe that this model, in addition to promoting Indigenous culture, meets the orientations and requirements of the current training program. It is therefore a model that we suggest to all teachers, for all students, whether Indigenous or non-Indigenous, to work together to better understand our history, our society and our environment. This new perspective may allow today's students to project themselves differently into tomorrow's world. ■

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