

Indigenous Knowledge and Science – Curriculum Resource Package

A Note to Teachers

This resource involves Indigenous Peoples, their ancient knowledge, practices, customs, and lifeways; therefore, the paradigm, agenda, purpose, process, and outcomes must be appropriate and sensitive to their perspective.

Indigenous Knowledge and Science are both ways of knowing and understanding our world and both have their own ways of interpreting that knowledge. Both shape our worldview.

Educators must be sensitive in how they incorporate Indigenous Knowledge. Due to the devastating impacts of the Residential School era, the continuing oppression through the Indian Act, and ongoing colonialism, Indigenous Knowledge has become fragmented. And as such, it cannot be assumed that individuals, communities or regions carry an intact, pristine Indigenous Knowledge base. In addition, educators must also be aware of how knowledge is obtained and transferred, which is very different than Eurocentric education. We caution educators on the dangers of appropriation (see section on Ethical Guidelines) when using the internet or other sources that are not credible.

This resource aims to provide a brief background on the impacts of colonialism and how it has impacted Indigenous Peoples and their Ways of Knowing in the hopes of helping educators become aware of how best to move forward to improve education outcomes for all. Also, this resource will provide tips and strategies on how to avoid essentialization (treating all Indigenous Peoples and their knowledge as the same) and appropriation, followed by examples of how to bring Indigenous Knowledge into the Science curriculum in an authentic and respectful way. This resource is not all encompassing, but will provide a starting off point for educators in Science.

Terminology

TERMINOLOGY

Terminology is important to understand not just what it means, but why it is used, when it is appropriate to use, and when it is not. As a best practice, it is recommended that educators find out what communities or people prefer to call themselves. For example, rather than say “this person is First Nation”, it may be more appropriate and respectful to say “she is Anishinaabe”.

The following are some guidelines for usage. Some references are taken from “*Indigenous Peoples: A Guide to Terminology*”, as found in the resources section.

Term: Indian

Meaning: “Indian” is the legal identity of an First Nations person who is registered under the Indian Act.

Can:

Use in direct quotations

Use when citing titles of books, works of art, etc.

Use in discussions of history where necessary for clarity and accuracy

Use in discussions of some legal/constitutional matters requiring precision in terminology

Use in discussions of rights and benefits provided on the basis of "Indian" status

Use in statistical information collected using these categories (e.g., the Census)

Caution:

This term is derogatory and outdated. This should be used in connection with the Indian Act solely. (Some organizations continue to have this term in their name for political/legal reasons.)

Term: Aboriginal Peoples

Meaning: The collective noun used in the Constitution Act 1982 and includes the Indian (or First Nations), Inuit, and Métis Peoples so, legally, it will always have a place at the terminology table.

Caution:

If using this term, it should always be Aboriginal Peoples together as opposed to Aboriginal or Aborigines. Currently, this term should only be used when referring to an existing organization or the Constitution Act of 1982.

Term: Indigenous Peoples

Meaning: A collective noun for First Peoples. The term “Indigenous” has a global context in many cases.

Can:

Use interchangeably with First Peoples

Term: First Nation(s)

Meaning: First Nation is a term used to identify Indigenous peoples of Canada who are neither Métis nor Inuit. This term came into common usage in the 1970s to replace the term “Indian” and “Indian band” which many find offensive. First Nations people includes both status and non-status Indians so there’s a need to be careful with its usage, especially if in reference to programs that are specifically for status-Indians. There is no legal definition for First Nation and it is acceptable as both a noun and a modifier.

Can:

Use to refer to a single band or the plural First Nations for many bands

Use “First Nation community” as a respectful alternative phrase

Use instead of “Indian” when referring to an individual

Understanding Colonialism

“Colonization can be defined as some form of invasion, dispossession and subjugation of a peoples. The invasion need not be military; it can begin--or continue--as geographical intrusion in the form of agricultural, urban or industrial encroachments. The result of such incursion is the dispossession of vast amounts of lands from the original inhabitants. This is often legalized after the fact. Historically, First Nation peoples (defined as Status Indians by the Indian Act) lost some 98% of their original lands through various legal means such as treaties and the Indian Act...[the long-term result of such massive dispossession is institutionalized inequality. The colonizer/colonized relationship is by nature an unequal one that benefits the colonizer at the expense of the colonized.” (Emma LaRocque, <http://www3.nfb.ca/enclasse/doclens/visau/index.php?mode=theme&language=english&theme=30662&film=&excerpt=&submode=about&expmode=2>, Accessed 07/27/16)

In the case of Canada, it is important to note that the Indigenous Nations were neither defeated, nor did they surrender their lands. Canada was created through a process of colonization. As a result, the Indigenous Nations have and continue to be subjected to various forms of oppression, including apartheid legislation, the *Indian Act 1857 to present*. In other words, Canada was created from land theft and genocide, and continues to maintain its control through various forms of systemic racism.

“The silencing of Indigenous voices is summed up by Bud Hall: ‘Year after year since the arrival of the Europeans on this continent, the non[Indigenous] education system has been erasing the stories, the histories, the cultures, the languages, and the ways of knowing of [Indigenous] Peoples. This project of silencing Canada’s First Peoples has reinforces the appropriation of land, the degradation of the environment, the creation of assimilationist residential schools, and the continuation of racist stereotypes about people of Aboriginal descent. And through curriculum design, program planning, school reform, textbook adoption, language policies, limitation of language provision, and thousands of smaller ways, many non [Indigenous] educators have participated knowingly or unknowingly in this educational silencing. The accumulated result of this systematic exclusion has been that information about aboriginal life has not been easily accessible to students, teachers and adult educators. In particular, the perspectives of aboriginal peoples, expressed in their own voices without the mediation of Western culture, have been largely absent.’”
(Pimatisiwin The Good Life, Global Indigenous Knowledge Systems, Priscilla Settee, 2013, pg 95)

It is important for educators to understand the deep impacts of colonization and how it still continues today. It is equally important that educators recognize how these systems of colonial power and privilege influence our social, political, and educational institutions, and who directly benefits.

“White privilege is the unquestioned and unearned set of advantages, entitlements, benefits and choices bestowed on people solely because they are white. Generally white people who experience such privilege do so without being conscious of it.” Peggy McIntosh

Non-indigenous peoples, including educators, must understand their own positionality with respect to colonization as they directly benefit from the power and privilege that comes from the continued social, political, and economic oppression of Indigenous Peoples.

Ways of Knowing

“For as long as Europeans have sought to colonize Indigenous peoples, Indigenous knowledge has been understood as being in binary opposition to “scientific,” “western,” “Eurocentric,” or “modern” knowledge.”

As human beings, we are constantly trying to understand the world we live in and how we relate to it. At its roots, it is natural curiosity. Science, and the scientific method, is one way we do this, and has its own ways of interpreting our understanding. Indigenous Knowledge is also a way we do this, and has its own ways of interpreting our understanding. As a result of colonization, science has enjoyed a position of power and privilege, while Indigenous Knowledge has and continues to be excluded and marginalized. Rather than looking to how all knowledge systems can contribute to furthering our understanding of the natural world, “Western” knowledge has been accepted as superior and this notion is reinforced by the continued exclusion, marginalization, and appropriation of Indigenous Peoples’ knowledge systems, cultures, languages, and histories.

Here are some things to consider about Science and Indigenous Knowledge:

What it is.....

<p>Science is a type of knowledge that is organized in the form of testable explanations and predictions. From this perspective, we are separate from our environment and, therefore, observable from the outside.</p>	<p>Indigenous Knowledge comes from having a deep understanding and relationship with the natural world. Rather than being separate from our environment, we are intertwined and everything operates as a whole.</p>
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These ways of understanding the world around us are both grounded in their own epistemologies (Ways of Knowing), ontologies (Ways of Being), and axiologies (Ways of Doing).

While Science is specific to how knowledge is organized, categorized, and validated, Indigenous Knowledge comes from everywhere and everything in both the seen and unseen world. Knowledge is accumulated, discovered, and transferred based upon an understanding of kinship, respect, reciprocity, and relatedness to all that exists in creation. While both knowledge systems can be viewed in equality, it is primarily the methods of knowledge accumulation and transference which differ.

Consider the following:

'Native Science' as process, according to Cajete, "...stems from a deeply held philosophy of proper relationship with the natural world that is transferred through direct experience with a landscape, and through social and ceremonial situations that help members of a [community] learn the key relationships through participation..." (2000, Cajete, p. 67).

Further, methods and tools utilized for knowledge accumulation and comprehension include: observation, experiment, meaning and understanding, objectivity, unity, models, causality, instrumentation appropriate technology, spirit, interpretation, explanation, authority, place, initiation, cosmology, representation, humans, ceremony, Elders, life energy, dreams and visions and paths, (Ibid, 66-71). (Philosophy of Native Science. Native Science: Natural Law of independence. New Mexico: Clear Lights Publishing).

"Traditional knowledge is more than a simple compilation of facts drawn from local, and often remote, environments. It is a complex and sophisticated system of knowledge drawing on centuries of wisdom and experience. It also constantly grows and changes with new information. To use this sophistication one must include the indigenous peoples themselves as practitioners." (CIDA, 3).

"Indigenous Knowledge is derived from the understanding of the natural cycles of the earth and how all life is interconnected in a delicate balance. Learning this knowledge comes from being a part of the environment. Nature creates a set of beliefs and values that governs our way of life. Indigenous Knowledge is not separate from the people who learn it, they are the knowledge, they are the land, and the land is ceremony. Everything is connected. The more we explore these traditional beliefs in our education system, the deeper our understanding and connection to the natural world will be."

Isaac Murdoch - Serpent River First Nation

It is important that educators realize there are multiple forms of Indigenous Knowledge, Traditional Ecological and/or Traditional Knowledge, that they are derived locally, rooted in land practice, relationships, and are people (Individually-collectively) specific. Educators must not essentialize it, meaning, Indigenous Peoples are diverse and have many ways of expressing themselves, including how they acquire and utilize knowledge.

Moving Forward

“Traditional knowledge systems of indigenous peoples, while highly variable in their contents and style, nonetheless all have a great deal to offer in sustaining life on the planet. Most traditional knowledge systems assume that people are part of the land, not that they own the land, so they consider themselves as true guardians. The wisdom derived from this philosophy can be used to advantage when planning for sustainability.” (2000, Canadian International Development Agency, Integrating Indigenous Knowledge in Project Planning and Implementation, pg. 3)

Our current global economy is based on resource extraction and the manufacturing of goods to supply the ever growing demand of consumerism. Although technological advancements have lifted the human race to a more comfortable existence, we also no longer have clean water to drink and we have reached a point of ecological collapse. As we consider what actions we must take to now deal with the consequences of climate change, we must also recognize that Indigenous Knowledge will be essential in looking for solutions to solving our climate problem. Western Science is now just beginning to understand what Indigenous Peoples have always known.

“Prior to European contact, the environment and land in Canada were clean, healthy and vibrant. The Original People of Turtle Island are completely weaved into the spiritual fabric of the land. To them, everything is alive and has a spirit. They believe that the great heartbeat of Mother Earth pulsates in everything. Their stories of the past are recorded at sacred sites and their legends adorn the rocks and stars. The secrets of the land are coded in the language, songs and customs of the Original Peoples. The symbiotic relationship with their sacred Mother is engrained in their values as a people. Since European contact, the Original Peoples of this land have suffered at the hands of colonialism, and so has the environment. However, both the Earth and Indigenous Peoples are resilient and as such, a resurgence of Indigenous Ways of Knowing have become revitalized. It is crucial that we recognize that reconciliation requires everyone to be a part of the solution. Regardless of our cultural or religious backgrounds, all Canadians have an important role to play in understanding the histories, cultures, and perspectives of First Nations, Métis and Inuit Peoples. Understanding these stories, legends and Indigenous Knowledge is key to finding solutions for our future.”

Isaac Murdoch, Serpent River First Nation

[Philosophy of Native Science](#): Native Science, Natural Laws of Interdependence.
Gregory Cajete. Clear Light Publishers, 2000.

Pimatisiwin The Good Life, Global Indigenous Knowledge Systems, Priscilla Settee,
2013