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Author Biography

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Comments Upon Chemistry and Incorporation of Indigenous Relevance: A Contrast Between Australia and Canada

Many countries around the world have indigenous peoples. I have chosen here a comparison and contrast between Canada and Australia. Both of our countries are endeavouring to bring relevance to the chemistry taught to their Indigenous peoples. The goal is to interest the students in science, and chemistry in particular, with the hope that they will find interest in science-related careers, and at least become aware of the chemistry underpinning of their respective cultures. And, also making all students of the science basis of Indigenous cultures.

In terms of the indigenous peoples there is an interesting parallel. While in Canada, there is general division between First Nations and Inuit, so in Australia, there are the Aboriginal Australians (an acceptable term in this context) and the Torres Straits Islanders (who migrated from Melanesia).

One key difference between the two countries is that, whereas education is a Provincial jurisdiction here; in Australia, it is a National uniform educational curriculum. The Australian Curriculum is working towards addressing two distinct needs in Aboriginal and Torres Strait Islander education and for the wider student population:

> that Aboriginal and Torres Strait Islander students are able to see themselves, their identities and their cultures reflected in the curriculum of each of the learning areas [including chemistry], can fully participate in the curriculum and can build their self-esteem
>
> that the Aboriginal and Torres Strait Islander Histories and Cultures cross-curriculum priority is designed for all students to engage in reconciliation, respect and recognition of the world's oldest continuous living cultures.

Both Indigenous peoples utilized chemistry, but the Torres Strait Islander peoples developed sophisticated chemical practices through observation and experimentation, demonstrating a deep understanding of chemical reactions and transformations. The Australian Standard Chemistry Curriculum now requires Indigenous chemistry relevance through each one of the years of schooling (see below).

And what about Canada? That the educational responsibility is Province-based should be no barrier to the insertion of Indigenous relevance, as we have shown elsewhere [1]. However, in this author's opinion, what we are desperately lacking is a repository site for articles on Indigenous chemical relevance, such as that in [2]. Only then can we compile a bank of relevant case studies. Then, working in harmony with Indigenous peoples and grade-school science teachers, actually develop curricula as complete as the Australians already have.

Let us explore this issue more this year in the Arctic, as "Chemistry for All" is the theme for the 52nd College Chemistry Canada Conference, Iqaluit, Nunavut.

Chemistry Content Description	Indigenous Applications
Yr. 1. Everyday materials can be physically changed in a variety of ways	exploring how Aboriginal and Torres Strait Islander peoples apply physical changes to natural materials to render them useful for particular purposes
Yr. 2 Different materials can be combined for a particular purpose	investigating the ways in which Aboriginal and Torres Strait Islander peoples combine different materials to produce utensils (hafting, weaving, sewing and gluing)
Yr. 3. A change of state between solid and liquid can be caused by adding or removing heat	investigating how changes of state in materials used by Aboriginal and Torres Strait Islander peoples, such as beeswax or resins, are important for their use
Yr. 4. Natural and processed materials have a range of physical properties that can influence their use	considering how Aboriginal and Torres Strait Islander peoples use natural materials for different purposes, such as tools, clothing and shelter, based on their properties
Yr. 5. Solids, liquids and gases have different observable properties and behave in different ways	recognising Aboriginal and Torres Strait Islander peoples' knowledge and understanding of evaporation and how the effect of evaporation can be reduced to conserve water, such as by covering surfaces
Yr. 6. Changes to materials can be reversible or irreversible	investigating Aboriginal and Torres Strait Islander peoples' knowledge of reversible processes, such as the application of adhesives, and of irreversible processes, such as the use of fuels for torches
Yr. 7. Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques	investigating separation techniques used by Aboriginal and Torres Strait Islander peoples, such as hand picking, sieving, winnowing, yandying, filtering, cold pressing and steam distilling
Yr. 8. Chemical change involves substances reacting to form new substances	investigating chemical reactions employed by Aboriginal and Torres Strait Islander peoples in the production of substances such as quicklime, plaster, pigments, acids, salts and ethanol
Yr. 9. Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer	investigating how Aboriginal and Torres Strait Islander peoples use fire-mediated chemical reactions to facilitate energy and nutrient transfer in ecosystems through the practice of firestick farming
Yr. 10. Different types of chemical reactions are used to produce a range of products and can occur at different rates	investigating some of the chemical reactions and methods employed by Aboriginal and Torres Strait Islander peoples to convert toxic plants into edible food products

References

1. C. C. Andersen, R. Naqitarvik, J. Winters, E. Taylor, G. Rayner-Canham, “Making chemistry relevant to Indigenous Peoples: An Inuit case study,” *The Science Teacher*, **91**(5), 22-30 (2024).

2. W. S. McNeil, “Indigenous Knowledge in Introductory Chemistry: Use of an Interior Salish Pit-Cooking Practice as a Rich Contextual Framework,” *Journal of Chemical Education*, 102(1), 164-172 (2025).

52nd College Chemistry Canada Conference

Chemistry for All

Nunavut Arctic College
Nunatta Campus

Iqaluit, NU
29 May – 01 June 2026



Details for the 2026 College Chemistry Canada Conference can be found at the conference website.
Registration and abstract submission is now open!

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