

An examination of student attitudes, decolonization and reinhabitation, community involvement,
and attainment of curricular outcomes as components of Place-based education

by

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Abstract

In modern society, children often spend limited time outdoors or in the local community and increasing time online. Although there is presently a resurgence in outdoor and community learning, in previous decades, schooling tended to focus on indoor, pen-and-paper tasks and standardized testing. Previous educational practices have tended to lead to a lack of personal connection to and understanding of the local environment and sustainability practices. In the United States and other developed western countries, there is a reliance on “traditional” school-based teaching methods, including standardized testing: curricula tends to focus on decontextualized conceptual learning rather than on concrete learning where concepts are connected to the local place. Place-based education offers an alternative approach to decontextualized, school-based learning by developing students’ sense of attachment to place through experiences in the local community with curriculum that is co-developed by teachers and community members, including Indigenous knowledge keepers. Research has shown that a place-based education approach, both through developing attachment to a place and also through community connections, can lead students to take action in their own communities. Further research needs to examine links between place attachment and student behavioural changes, as well as to examine the diversity of narratives, including Indigenous perspectives, which are a crucial component to understanding local places. The purpose of this research is to examine how a place-based curriculum affects students’ attitudes towards local places, how a place-based curriculum can bring about decolonization and reinhabitation, how community learning can

enhance place-based education, and how place-based education affects traditional curricular outcomes.

Keywords: place-based education, place-based learning, rural, urban, school-community collaboration, decolonization, reinhabitation, Indigenous education, Indigenous knowledge, land-based learning, local

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Introduction

Place-based education is not concisely defined across the literature, but rather is considered a sub-category of environmental education that is commonly associated with “experiential learning, contextual learning, problem-based learning, constructivism, outdoor education, indigenous education ... ecological education, bioregional education, community-based education, critical pedagogy itself...” (Gruenewald, 2003, p. 3).

Despite the lack of a succinct definition for Place-based education, the most frequently referenced understanding of this approach to curriculum and pedagogy is Smith’s (2002) explanation. Smith (2002) cites five characteristics of Place-based education, and his theories are referenced in nearly all 23 empirical studies that I examined. First of all, he identifies the essential component of Place-based education as being that curriculum is based on the local environment. After extended local studies, place-based curriculum can be understood to act as a lens for students to eventually examine places further afield (p. 293). Second, a place-based approach positions students as creators of knowledge as opposed to consumers of knowledge. Third, in a similar way to inquiry-based learning, students are encouraged to devise questions based on personal interest and set their own goals for learning, which in turn result in increased student engagement (p. 293). Fourth, teachers act as facilitators of learning opportunities, rather than dispersing knowledge to students. Finally, there is ideally a flexible border between school and community: learning is not limited to the school building, and students frequently move between the community and the school (p. 293). In this introduction, I will discuss my own interest in place-based education, provide connections to its general importance in the field of education, explain terminology that is essential to understanding place-based education, and explore research questions that I have chosen in this area.

Personal Interest and Investment

I am a Non-Indigenous Aboriginal Literacy and ESD (English Skills Development/English as a Second Dialect) teacher who resides on the traditional territories of Esquimalt and Songhees (Lekwungen) First Nations. Through my work in Sooke School District (SD 62), I have the privilege to learn with and from Coast Salish T'Sou-ke Nation and Scia'new Nation, as well as Nuu-chah-nulth Pacheedaht Nation.

I am an avid outdoorsperson: I enjoy exploring local areas and participating in local communities. In my teaching context, I often have access to local outdoor educational spaces. One of my goals as an educator is to use instructional time outdoors effectively through Place-based education, while also respectfully integrating Indigenous Knowledge and building community connections with students. I aspire to spend more time outdoors with the classes I teach to encourage children to inquire about the ecosystems of the traditional territories where we live, and to develop their desire to protect the local area and participate in sustainable practices.

Since place-based education is founded on holistic, environmental learning and community involvement (Smith, 2002), I believe it may be a strong fit with my own teaching philosophy and role as an Aboriginal Literacy teacher. I am particularly interested in exploring aspects of place-based education that may be harmonious with Indigenous Education and those aspects that may be disharmonious or require further research to support inclusion of Indigenous Knowledge. I also hope to explore opportunities for holistic, community-based learning through Place-based education.

Significance and Importance

From a general lens, British Columbia's (BC) revised 2016 curriculum emphasizes individual choice in student learning, flexible learning environments, and the integration of Indigenous Knowledge at every subject and grade level (Government of British Columbia, 2017). The "New Curriculum Brochure" (Government of British Columbia, 2017, p. 1) directly links Indigenous Knowledge and place-based education. Place-based education provides opportunities both to respectfully integrate Indigenous knowledge and to provide students with autonomy in making choices around their learning outdoors and in community. In addition, the place-based approach connects to the new BC core competencies (Government of British Columbia, 2017), which include "communication, thinking, and personal and social" competencies, and emphasize inquiry-based learning (p. 1). In my own work, I hope to further support classes and teachers in implementing new curricula from the perspective of place-based learning and to develop my awareness of "best practices" in this area.

Definitions

Common terminology referenced across place-based education studies includes *critical pedagogy of place*, *decolonization*, *reinhabitation*, and *place attachment*.

Critical pedagogy of place. Critical pedagogy of place, first defined by Gruenewald (2003), is a fusion of critical pedagogy originating from Paulo Freire's (1970) work, and place-based education. Gruenewald (2003) believes there is a significant connection between the two pedagogies and combines them to form *critical place-based pedagogy*: while place-based education connects humans to their social and natural environment and encourages them to affect their environments in a positive way, critical pedagogy unsettles majority or dominant culture discourses, and so enhances the community or social element of place-based education

(Gruenewald, 2003, p. 3). The theory of critical pedagogy of place also responds to the neglect in education of the relationship between places and economic development (Gruenewald, 2003).

Nearly all 23 of the place-based education researchers in the studies I examined cited both Smith's (2002) definition of place-based education and Gruenewald's (2003) definition of critical pedagogy of place as the theoretical bases for their work.

Through critical pedagogy of place, Gruenewald (2003) intended to address what he understands as the discrepancy between place-based education and critical pedagogy: historically, place-based education has focused on rural contexts, while critical pedagogy tends to focus on education in urban locations. Despite Gruenewald's (2003) proposition that critical place-based pedagogy should include urban, multicultural environments in addition to rural, white environments, the majority of the 23 empirical studies I surveyed took place in rural environments (Bertling, 2015; Buxton, 2010; Donovan, 2016; Howley et al., 2011; Ngai & Koehn, 2010; Ngai & Koehn, 2011; Muthersbaugh et al., 2014; Pike, 2011; Santelmann et al., 2011; Smith, 2017; Somerville & Green, 2011; Takano et al., 2009; Zimmerman & Weible, 2017), with fewer studies taking place in urban environments (Gray & Birrell, 2015; Eilam & Garrard, 2011; Kuwahara, 2012; Mannion et al., 2013; Smith, 2017) and a handful taking place in Indigenous Education-based learning environments (Ngai & Koehn, 2010 & 2011; Kuwahara, 2012, Takano et al., 2009; Yamauchi & Purcell, 2009).

Decolonization. According to Gruenewald, decolonization “involves learning to recognize disruption and injury, and to address their causes,” (2003, p. 9) while reinhabitation “involves learning to live well socially and ecologically in places that have been disrupted and injured” (2003, p. 9). Decolonization includes recognizing that colonization and development

have occurred. Reinhabitation recognizes the need for reconciliation with the both people and the land.

Place attachment. Kuwahara (2012) describes *place attachment* as a “combination of place dependence and identity” (Vaske & Kobrin, 2001, in Kuwahara, 2012). Vaske & Kobrin (2001) define “place dependence” as the continued relationship that people develop with the landscape, while “place identity” is an emotional connection with a place developed over repeated visits. For Kuwahara, (2012, p. 191) “place dependence” includes peoples’ understanding of local resources and ecological services that distinguish a local place from other places, while “place identity” refers to emotional attachment that is created through experiencing a local place (Kuwahara, 2012, p. 191). Although place attachment is a term mainly explored in Kuwahara’s 2012 research, the term is useful to help in understanding the frequent theme of developing student attitudes towards the environment in place-based education.

Background

Place-based education has its origins in the work of John Dewey, who believed that school learning should be based on knowledge that is learned at home, rather than school learning and home learning being disconnected, as they often are (Dewey, 1929). He believed that children are most interested in the environment itself, rather than ideas about it, and so children should be educated within a community context that values knowledge from their homes. Smith (2002) extends Dewey’s concept of the “disconnect” between home and school to explain that children value knowledge connected to their “social reality” (p. 586): this kind of knowledge is of value to students through its value to their family members and community. According to Gruenewald (2003), the lack of connection between home and school curricula is a problem that persists in American schools and is exacerbated by the present educational focus on

the No Child Left Behind policy and on standardized testing. Literature explored in this review cites the standardization of curriculum in the 2001 No Child Left Behind policy in the United States (Buxton, 2011; Ngai & Koehn, 2011; Silverman & Corneau, 2017; Yamauchi & Purcell, 2009) as well as policy documents in other countries (Pike, 2011; Smith, 2017) that are considered to exist in opposition to place-based education approaches: generalized or standardized curriculum tends to restrict the time allocated for place-based education, as well as access to local places and resources.

Place-based education is, by definition, specific to local places and therefore, a place-based approach necessitates the development and implementation of local curriculum. In order to implement local curriculum successfully, Smith (2002) proposes five thematic factors for success in a PBE program: these include cultural studies, nature studies, problem solving, internships and entrepreneurial activities, and participation in community processes (pp. 587-590).

At least two empirical studies cited Nespor (2008) as a critic of existing forms of place-based education theory (Mannion & Addey, 2011; Mannion et al., 2013). Nespor takes issue with the way “place” is defined in place-based education theory, with certain theorists’ understanding of difference and how they “connect place to race, class, and gender,” and their interpretations of place-based education as “an educational or social movement” (Nespor, 2008, p. 478).

In my review of place-based education research, I observed four main themes across the literature that are relevant to developing successful place-based education programs: the development of students’ attitudes toward a local place, strategies for decolonization and reinhabitation, effective community involvement and collaboration in local curriculum, and the connection of place-based learning to traditional educational outcomes or curricula.

Student Attitudes

Although Kuwahara's (2012) work is the only one of the 23 empirical studies that directly references "place attachment," many studies referred indirectly to this concept through discussion of changes in student attitudes toward place and increased understanding of the local place (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015; Mannion et al., 2013; Ngai & Koehn, 2010). Place attachment, or student attitude towards a place, can be positive or negative. In most cases examined in the research, teachers were successful in developing positive student attitudes in relating to the local environment (Bertling, 2015; Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Takano et al., 2009). Four studies (Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Smith, 2017) examined specific incidences where student attitudes were negative towards certain aspects of place-based learning. In general, negative student attitudes in place-based pilot projects were situational and did not overpower positive learning (Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012). Some studies went on to examine whether or not improved student attitudes and strengthened identity in relation to local place resulted in behaviour changes related to ecological conservation (Buxton, 2010; Eilam & Garrard, 2017; Zimmerman & Weible, 2017) or community political involvement (Buxton, 2010; Zimmerman & Weible, 2017). The literature suggests that developing *place attachment* in students via spending time outdoors and in the community can potentially lead to positive behavioural change and problem-solving related to environmental and community-based decision-making, although more research is needed to examine potential correlations between place-based learning and student behavioural outcomes.

Decolonization and Reinhabitation

Gruenewald's (2003) theories of *decolonization* and *reinhabitation* are directly applicable to Indigenous perspectives in place-based education, especially considering that all local places examined by 23 empirical studies have experienced and are still experiencing colonization, and most are currently participating in the process of reconciliation with their Indigenous populations. A related concept cited by several place-based education studies is Ejick and Roth's (2010) notion of "place as chronotope". In using the term "chronotope" to refer to place, Ejick and Roth exemplify how ideas of place exist in time and space, and that understandings of place are based on multiple cultural narratives. To demonstrate differing narratives of place, these authors juxtapose the diverse understandings of a local place called SNITCEL, or Tod Inlet, by WSÀNEĆ Nation and the local settler society. The theory of "place as chronotope" is particularly applicable to place-based education through the lens of Indigenous knowledge, since "place" does not exist independent of culture. Therefore, in order to "decolonize" and "reinhabit" place, all place-based education approaches need to include narratives of the local Indigenous culture, ideally through collaboration with Indigenous people and through critical discussion of settler narratives of place. Place-based studies with Indigenous Education as their focus provide strong exemplars of how to decolonize and reinhabit communities and public schools (Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2010 & 2011; Takano et al., 2009).

School-community Collaboration

The majority of place-based education studies I examined analyzed the theme of collaboration between schools and communities, including collaboration with parents, (Mannion & Addey, 2011) with community experts, (Howley et al., 2011; Yamauchi & Purcell, 2009;) with businesspeople and tradespeople, (Howley et al., 2011; Santelmann et al., 2011) with non-

profit organizations, (Howley et al., 2011; Kuwahara, 2012; Yamauchi & Purcell, 2009) and with cultural groups (Gray & Birrell, 2015; Ngai & Koehn, 2010; Kuwahara, 2012; Takano et al., 2009; Yamauchi & Purcell, 2009), to build capacity for future place-based teaching. Sustainable partnerships between schools and community shareholders that effectively support place-based education require time outside regular school hours and careful communication (Yamauchi & Purcell, 2009).

Traditional Educational Outcomes

The results of several place-based education studies suggested that including traditional educational outcomes in place-based education programs or units of learning (Buxton, 2010; Muthersbaugh et al., 2014; Perkins et al., 2011; Zimmerman & Weible, 2017) or including place-based learning outcomes in traditional educational settings, (Donovan, 2016; Waller & Barrentine, 2015) which can promote success for students and can result in learning that meets or exceeds the standards for traditional classroom programs (Buxton, 2010; Donovan, 2016; Muthersbaugh et al., 2014; Perkins et al., 2011; Zimmerman & Weible, 2017). The inclusion and attainment of traditional learning outcomes in place-based education programs or units was seen by researchers as being crucial to acceptance of the legitimacy of place-based education by teachers (Buxton, 2010; Miller & Twum, 2015; Pike, 2011). Learning environments that teachers cited as being conducive to successful place-based experiences and the attainment of learning outcomes were often student-directed and inquiry based (Mannion et al., 2013; Silverman & Corneau, 2017; Miller & Twum, 2015) and led to positive changes in student behaviours and outlook toward the environment (Miller & Twum, 2015; Silverman & Corneau, 2017).

Research Questions

The purpose of the first part of this study is to review the empirical literature on place-based education. Specifically, as suggested in the preceding sketch of the research background, the following questions guide the review.

1. How does emphasis on a place-based curriculum influence students' attitudes towards place?
2. How does a program of place-based education facilitate decolonization and reinhabitation?
3. Which characteristics of school-community collaboration are effective in place-based education?
4. How does place-based education encourage the attainment of traditional learning outcomes?

Research Pathway

The search terms I used include “Place-based learning” and “Place-based education”. I located approximately 23 peer-reviewed empirical articles on Place-based education published between 2007 and 2017 through search engines including the University of Victoria’s “Summon 2.0” and through the “Web of Science”. As well, a colleague and I who are both researching place-based education shared lists of the articles we had located.

As I read, I made note of frequently cited authors’ names in each of the empirical studies in order to read and apply relevant background theoretical literature. In the empirical studies, the most frequently cited non-empirical authors were Gruenewald, Smith, and Sobel, which prompted me to search for articles they had authored in order to understand better the theoretical

basis for my topic. I read and analyzed the most frequently cited Gruenewald and Smith articles, but was not able to locate an article written by Sobel, since he has authored books only.

I decided to limit my research to studies undertaken in elementary, middle and secondary schools, and did not include studies on place-based education undertaken in post-secondary settings. I recorded the location of each study, since local place is a key element that affects the development of place-based curriculum. The majority of empirical studies on the topic of place-based education have been undertaken in the United States, with a significant number of studies located in the United Kingdom and Australia, and fewer in Canada. I located one Canadian theoretical article on the topic of place-based education (Ejick & Roth, 2010) and only one Canadian empirical study. The Canadian empirical study (Miller & Twum, 2017) suggested that Canadian studies have tended to focus on Environmental Education as a whole rather than on place-based education specifically, which may explain why there were so few Canadian articles.

A handful of articles on place-based education from developing countries exist in the literature, but I decided not to include these studies in my review, since I expect that the implementation of place-based education differs substantially in the context of developing countries as opposed to developed countries. The phenomena of place-based education in developing countries may warrant a separate research review, since research from developing countries exceeds the intended scope of this project.

Literature Review

Introduction to the Literature Review

In this study, I will review a selection of literature pertaining to place-based education and pedagogies in K-12 educational systems in developed countries. According to literature examined in this review, the implementation of place-based pedagogies and curricula generally results in improved connections to local places and communities, and overall, students who have participated in place-based learning demonstrate positive attitudinal outcomes (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015; Kuwahara, 2012; Ngai & Koehn, 2010). Place-based learning can result in improved student understanding of and connection to the Indigenous history and culture of local place when decolonization and reinhabitation (Gruenewald, 2003) are part of the program (Buxton, 2010; Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2010; Ngai & Koehn, 2011; Takano et al., 2009). Additionally, place-based education is often based on student-directed, inquiry style learning (Mannion et al., 2013; Silverman & Corneau, 2017; Twum & Miller, 2015) and meets or exceeds the requirements of traditional learning outcomes (Buxton, 2010; Donovan, 2016; Muthersbaugh et al., 2014; Perkins et al., 2011; Zimmerman & Weible, 2017).

Four main themes arose from the literature I examined: place-based education affects students' positive and negative attitudes towards local places and towards their learning (Bertling, 2015; Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Ngai & Koehn, 2010; Pike, 2011; Smith, 2017) ; place-based pedagogy is an ideal vehicle for decolonization and reinhabitation (Gruenewald, 2003) in education (Buxton, 2010; Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2010 & 2011; Takano et al., 2009); community involvement is an essential component of place-based education (Howley et al., 2011; Mannion & Addey, 2011; Santelmann

et al., 2011; Yamauchi & Purcell, 2009); and finally, place-based education generally leads to attainment of traditional learning outcomes that is equal to or exceeds student progress assessed through more traditional teaching methods (Buxton, 2010; Donovan, 2016; Perkins et al., 2011; Muthersbaugh et al., 2014; Zimmerman & Weible, 2017). Based on the literature reviewed and the aforementioned themes, I have compiled four research questions: How does emphasis on a place-based curriculum influence students' attitudes towards place? How can a program of place-based education encourage decolonization and reinhabitation (Gruenewald, 2003)? Which characteristics of school-community collaboration are effective or ineffective in place-based education? How does place-based education impact traditional learning outcomes? I will provide answers to the following four questions using empirical evidence, and I will also discuss and critique the research and suggest future directions for research in this field.

Student Attitudes

Introduction. The first of the four questions I will examine in this review is “How does emphasis on a place-based curriculum influence students' attitudes towards place?” My goal in posing this question is to ascertain how students' attitudes towards place are affected by place-based learning, and more specifically, if the attitudes they displayed during or after place-based learning experiences were positive, and what effects these attitudes had or potentially lacked in relation to pro-environmental and pro-social behaviour and actions taken by students during or after experiences of place-based curricula.

Review. The articles I reviewed indicate that on the whole, place-based curricula and pedagogy typically result in students developing positive attitudes towards local places. Positive attitudes towards place-based curricula led to pro-social and pro-ecological views of local environments and communities, (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015;

Kuwahara, 2012; Ngai & Koehn, 2010) and positive attachment towards a place may potentially lead to pro-environmental and pro-social behaviours (Bertling, 2015; Eilam & Garrard, 2017). In some cases, although the overall effect of place-based curricula was positive, occasional challenging experiences caused students to develop negative attitudes towards some aspects of place-based experiences (Bertling, 2015; Kuwahara, 2012). Two studies (Pike, 2011; Smith, 2017) examined children's existing attitudes towards local place without students specifically participating in a place-based curriculum; however, they are still significant in place-based education literature since they illustrate the kinds of effects that students' prior life experiences may have on the development of a positive connection to place through a place-based curriculum.

Seven empirical studies focused directly on students' attitudes towards place, (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015; Kuwahara, 2012; Ngai & Koehn, 2010; Pike, 2011; Smith, 2017) and five of the seven studies analyzed how specific place-based pilot projects affected students' development of positive and negative attitudes towards place (Bertling, 2015; Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Ngai & Koehn, 2010) while two sample-based studies (Smith, 2017; Pike 2011) examined students' existing positive and negative attitudes towards local places in Wales and Ireland across a number of schools.

This section of the review on student attitudinal outcomes is divided into four sub-themes based on the following findings: studies used various tools to measure student attitudinal changes, (Bertling, 2015; Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Ngai & Koehn, 2010) positive experiences with place-based curricula tend to lead to positive attitudes towards local places and the environment, (Bertling, 2015; Gray & Birrell, 2015; Eilam &

Garrard, 2017; Kuwahara, 2012; Ngai & Koehn, 2010) while pre-existing negative attitudes or new experiences that are perceived as negative can affect the development of positive attitudes towards place, (Bertling, 2015; Eilam & Garrard, 2017; Smith, 2017) and finally, even when positive attitudes exist, there may or may not be direct behavioural correlation between positive attachment to a place and actions that students take in the community and environment (Bertling, 2015; Eilam & Garrard, 2017).

Measurement of student attitudinal changes. In the studies referenced in this section of the review, researchers often used measurement tools and strategies, including pre and post-study activities, drawings, or questionnaires to measure the attachment of students to the place in question through observations during a place-based unit or program of study. Measurements tended to indicate a positive trend in student attachment to place when student understanding and engagement before, during, and after a given pilot project were analyzed (Bertling, 2015; Eilam & Garrard, 2017; Grey & Birrell, 2015; Kuwahara, 2012; Ngai & Koehn, 2010). Pre- and post-project measurement tools gauged changes in students' ecological paradigms, (Bertling, 2015) intercultural cultural understandings (Kuwahara, 2012; Ngai & Koehn, 2010), differences in place attachment based on student cultural affiliation (Kuwahara, 2012) emotional and cognitive attachment to local place (Grey & Birrell, 2015; Kuwahara, 2012), and potential changes in student behaviour and actions after developing their understanding of local environments (Bertling, 2015; Eilam & Garrard, 2017).

In measuring attitudinal differences before and after a place-based, critical arts pilot project, Bertling (2015) administered the New Ecological Paradigm (NEP) Scale for Children, which measures three areas of ecological paradigms, including “rights of nature, eco-crisis, and human exemptionalism” (Bertling, 2015, p. 10). Bertling (2015) found that students' pro-

ecological worldviews generally increased over the course of the program, and that the majority of student scores were more “ecocentric” (more focused on the environment), while three students’ scores became more “anthropocentric” (more focused on humanity) (Bertling, 2015, p. 9). The most significant gain was in the “eco-crisis” dimension of the NEP, with less significant results noted in the area of “rights of nature” (Bertling, 2015). Despite having participated in place-based learning, students were still inclined to see humans as being separate from the environment (Bertling, 2015).

To learn whether participation in a place-based science program would increase students’ “place attachment” (Kuwahara, 2012, p. 191) and to analyze whether “cultural grounding” (p. 195) affected development of students’ “place attachment,” Kuwahara examined the responses of two groups of grade 10-12 students with different cultural and institutional affiliations at the same Hawai’ian high school. Students were either part of the Hawaiian culture-based Hawaiian Academy or enrolled in regular science courses. Both groups visited three field sites representative of the local environment, including a nature park, an urban stream site, and a makai (offshore island) (Kuwahara, 2012, p. 195). Kuwahara’s (2012) results indicated similarities between “institutional” and “cultural” identities; (p. 192) however, some important differences exist. For example, Kuwahara (2012) noted potential cultural differences in student field-based writing: Hawaiian Academy students tended to write more about “bacteria and pollution,” (p. 196) while non-Hawaiian Academy students used the words “species” and “turbidity” (p. 196) and occasionally mentioned pollution. A second significant finding was that the Hawaiian Academy students valued off-site field trips more than the general science group, which indicates a greater match between the Hawaiian Academy students’ cultural and institutional identities (p. 204). In comparison, the non-Hawaiian Academy group tended to

focus on spiritual teachings around Hawaiian culture, which suggests the need for increased cultural teaching in general schooling. Kuwahara (2012) hypothesized that Hawaiian Academy students perceive spirituality as ever-present, whereas this kind of spiritual understanding may be new to non-Hawaiian Academy students

Ngai and Koehn (2010) researched the impact of a two-year long Indigenous Education intercultural place-based pilot project on K-5 students at a primary school in Montana. With local tribal representatives, the researchers developed and administered a survey three times throughout the program to ascertain gains in students' understanding of local tribes' histories and cultures, students' attitudes toward Indigenous Americans, and their interest in different languages, cultures, and people (Ngai & Koehn, 2010, p. 199). To compare the effectiveness of the program at Lewis and Clark school with a non-Indigenous Education For All (IEFA) funded school, students from a neighbouring school took the survey in 2007 (Ngai & Koehn, 2010). The greatest attitudinal difference was in the area of why students wanted to learn more, and students at L&C cited having "American Indian" friends and teachers as affecting their desire to learn about Indigenous cultures. Another significant finding was a sustained increase in student identification of local tribes (Ngai & Koehn, 2010). The researchers concluded that students made strong gains in knowledge of Montana tribes and in developing their sense of place, and the program was deemed effective in terms of cognitive learning; (p. 603) however, its effect was impactful in some but not all attitudinal areas. For instance, there was a decline in stereotypical images of Indigenous peoples and an increase in appreciation for connectedness with Indigenous peoples, but less increase in desire to continue their intercultural learning (Ngai & Koehn, 2010).

Eilam & Garrard (2017) examined potential connections between primary students' cognitive and emotional connections to local Australian grasslands and their potential desire to protect other areas by learning in the grasslands and then engaging the students in a community planning scenario. They found that when students' planning scenarios occurred in remote sites, although they maintained positive attitudes towards the grasslands, four out of five groups demonstrated they were willing to give up some of the remote grasslands for new houses or facilities in their neighbourhood. In the end, only one out of five student groups exhibited complete attitudinal and behavioural alignment in their decision-making processes (Eilam & Garrard, 2017, p. 14).

To summarize this sub-section on measurement of student attitudinal changes, the before-and-after surveys and observations reviewed in detail above (Bertling, 2015; Kuwahara, 2012; Ngai & Koehn, 2010) included a variety of findings that are potentially useful to educators in planning place-based projects: place-based learning has the potential to affect students' pro-ecological paradigms more strongly in some areas than others, particularly in the NEP areas of "eco-crisis" and "eco-centrism," (Bertling, 2015) while student attitudes of "anthrocentrism" or focus on human-centered activity may be more challenging to address (Bertling, 2015); different cultural groups of students within a school may have varying understandings of local culture, and may require teachings tailored to their cultural understanding or lack thereof (Kuwahara, 2012), and educators may need to consider the value of local learning in itself, as more research needs to be done to understand whether local place-based learning is transferable to other cultures (Ngai & Koehn, 2010) or remote contexts (Eilam & Garrard, 2017).

Positive experiences towards place. According to empirical research, positive student attitudes toward place can be fostered through a variety of cross-curricular place-based education

approaches, including Arts-based, (Bertling, 2015; Gray & Birrell, 2015) cross-curricular Science approaches (Eilam & Garrard, 2017; Kuwahara, 2013) and Indigenous Education-based approaches (Ngai & Koehn 2010 & 2011; Kuwahara, 2012; Takano et al., 2009). In addition to developing place-specific knowledge, (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015; Kuwahara, 2012; Ngai & Koehn, 2010) experiencing emotions or “affect” in relation to a place were also mentioned frequently as having an important role to play in fostering positive place attachment (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015; Kuwahara, 2012).

Emotional connection. Several studies identified a need for an emotional connection or affective element in learning in order to create positive attitudes toward place (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015). Two of these studies used art-based programs to connect students to local place through positive emotions (Bertling, 2015; Gray & Birrell, 2015). Bertling, (2015) intended to create a natural relationship between students and local places by focusing on how students could develop “empathy with the environment,” (p. 3) and according to findings, strong emotions led to a positive bond between students and the site (Bertling, 2015). Bertling (2015) suggested that art as a subject area presents special opportunities for students to develop empathy for the environment through aesthetic experience, providing multiple viewpoints for ecology, and providing experiential education that has the potential to change student attitudes and behaviours (p. 2). Likewise, Gray & Birrell (2015) found that a combination of arts and ecopedagogy “produced unexpected results in the affective domain” (p. 344); through analysis of data from their pilot project, they concluded that love and connection with the Earth were essential to promoting authentic, engaging, and enduring learning for students (p. 244). Although “love” and emotions are subjective and therefore difficult to define,

these researchers (Gray & Birrell, 2015) concluded that it is essential for educators to help students make emotional connections with natural places (p. 345).

Eilam and Garrard's (2017) study focused more on student preference than emotion in comparison to the other two studies in this subtopic (Bertling, 2015; Gray & Birrell, 2015). Their research (Eilam & Garrard, 2017) of a place-based program for primary students in the Australian grasslands highlighted how student preference was part of "cognitive attitudinal dispositions" (p. 14). Teams of primary students were responsible for designing communities as a culminating cross-curricular project, and they had to decide how much of the fragile grasslands environment they would preserve. They tended to fill spaces perceived as "empty" (often grasslands) on their community design map with structures they favoured (Eilam & Garrard, 2017). If students demonstrated a preference for grasslands, they usually chose to include grasslands in their design even if they perceived grasslands as "empty" (Eilam & Garrard, 2017).

Negative attitudes or experiences towards place. Although the majority of articles reviewed in this section analyzed negative student attitudes or experience to some degree (Bertling, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Smith, 2017) each empirical study focused on different aspects of negative attitudes; therefore, findings across the studies vary. In one place-based high school program, teachers were aware of existing negative student perceptions of the local environment, and they successfully carried out positive experiences to counteract negative perceptions (Kuwahara, 2012). A second study found that some negative experiences during a critical arts-based place-based unit did not appear to affect students' overall positive attitudinal outcomes, although students may have retained negative attitudes toward one activity (Bertling, 2015). A third study noted that a group of primary students tended to experience negative attitudes toward places that are perceived as "empty," (Eilam & Garrard,

2017) in contrast to the positive attitudes they experienced toward places perceived as “full”. A fourth study (Smith, 2017) analyzed students’ views of their locality in Wales, and found evidence that there may be a connection between negative student attitudes toward place (without students having participated in a place-based unit) and low socioeconomic status (Smith, 2017).

One instance of pre-existing negative student attitudes in a place-based science unit was based on the presence of trash in the local stream, which pre-conditioned students to see this environment in a negative light (Kuwahara, 2012). To counteract negative student attitudes toward the stream environment, teachers planned field trips that allowed students to develop positive associations through experiences there (Kuwahara, 2012, p. 202). In this case, pre-existing negative attitudes presented an opportunity for students to participate in creating new, positive understandings of their environment: students commented that the field trips improved their learning, helped them change their environmental perspectives, and improved relationships between students and teachers in the group (Kuwahara, 2012).

In order to illustrate caring for the natural world, a group of students in an arts-based pilot project cultivated plants (Bertling, 2015). This is an example of students developing negative attitudes limited to a certain activity: when the plants grew well, students made positive verbal and written comments; however, when plants did not mature as students had expected, they tended to lose hope that their plant would survive (Bertling, 2015). Although students felt dissatisfied with this activity, and as a result, lacked confidence in their own ability to cultivate plants, a few students suggested that the experience had a positive side, since it encouraged them to learn more about the proper cultivation of plants (Bertling, 2015).

Eilam & Garrard (2017) wanted to know how primary children understood the environment in relation to the terms “empty” and “full”. Students in this study perceived a space as “empty” when there were no obvious human structures or activities present in an area and were apt to view “empty” areas as negative. Even after students participated in place-based learning in the Australian grasslands, the perception of “empty space” tended to carry a negative attitudinal weight (Eilam & Garrard, 2017). These findings suggest that children in the study often attempted to fill in “empty” spaces with human structures because the perception of empty spaces as negative caused them discomfort (Eilam & Garrard, 2017).

To learn how students across Wales perceived their local areas in contrast to Welsh curricular representations of place, Smith (2017) instructed 831 thirteen- to fifteen-year-old students to “list three words” that represented their home area (p. 602). He found that the most commonly used words in every region were “friendly” and “quiet;” (p. 605); however, students’ choice of third word indicated significant differences in their perception of local places. Although the researcher did not have access to participants’ socio-economic data, he had access to data for the percentage of students at each school who received free school meals, (FSM) and when he compared the FSM rates across schools, he found that students who attend schools above the national average for FSM tended to have a more negative view of their neighbourhoods than the students who lived in areas below the national average for FSM (Smith., 2017). These students were therefore more likely to choose a negative word as the third word in their list (Smith, 2017, p. 606). These findings suggest the need for further exploration of the possible connection between socioeconomic status and negative student attitudes toward local places, and in addition, they suggest that the Welsh national “Curriculum Cymreig” may be insufficient in addressing circumstances in specific local places (Smith, 2017, p. 609).

Potential correlation between positive attitudes and pro-environmental or pro-social actions. Three of seven studies extended the analysis of student attitudes in place-based learning by considering what impacts student attitudes might have on future pro-environmental or pro-social behaviours (Bertling, 2015; Eilam & Garrard, 2017; Ngai & Koehn, 2010). These studies provided opportunities for students to expand upon their learning: for example, middle school students re-purposed recycled materials to make art (Bertling, 2015), while primary students designed future communities while taking into consideration their learning about Australian grasslands (Eilam & Garrard, 2017), and researchers interviewed students about their interest in further intercultural learning after participation in an Indigenous Education-based program (Ngai & Koehn, 2010).

Bertling's (2015) project included the opportunity for students to take ecological action in their own lives through participating in ecologically-responsible art including repurposing recycled objects. Bertling (2015) noted that most participants emphasized recycling as a lifestyle change they planned to adopt, and students became aware of how their own actions might impact others' ecological attitudes (p. 18-19). However, this study did not analyze whether students did indeed recycle more frequently after participation in the unit.

Eilam & Garrard (2017) wanted to know whether students' learning in a local grassland could be transferred to remote grasslands, and whether students' positive attitudes and behavioural intentions would be aligned at both the local and remote sites. At the local site they studied, the students demonstrated complete alignment between their positive attitudes and their behavioural intentions to preserve the grasslands; however, when students considered design projects on remote grassland sites, despite their continued positive attitudes toward grasslands, four out of five student groups were inclined to part with some of the remote grasslands to create

new facilities (p. 14). These findings indicate that children's attitudes and behavioural intentions may be less aligned when applied to future scenarios or spatially remote locations, (Eilam & Garrard, 2017) and that place-based learning may not necessarily be transferable to locations that are removed in time and space.

Ngai and Koehn's (2010) research on the Indian Education For All program at a K-5 school in Montana expands on Eilam and Garrard's (2017) findings that student attitudes toward local places may not extend to spatially remote locations: they found that students' interest in learning about local cultures does not necessarily extend to cultures from spatially remote locations (Ngai & Koehn, 2010). Although the place-based IEFA program was successful in terms of increasing student knowledge of local tribes, developing sense of place, and appreciation for connection with Indigenous peoples, these researchers found that students' desire to continue their intercultural learning by learning about additional cultures that were not connected specifically to local place had not increased (Ngai & Koehn, 2010).

Discussion.

Summary. This section of the literature review analyzed four sub-themes pertaining to the theme of student attitudes in place-based education. The studies surveyed included various forms of measurement to discover changes in students' place attachment, and each study measured specific aspects of student attitudes, including changes in student ecological paradigms, (Bertling, 2015) intercultural understandings, (Kuwahara, 2012; Ngai & Koehn, 2010) differences in place attachment based on student cultural affiliation, (Kuwahara, 2012) emotional and cognitive attachment to local place, (Grey & Birrell, 2015; Bertling, 2015; Eilam & Garrard, 2017), and student perceptions of places as "empty" versus "full" (Eilam & Garrard, 2017).

Overall, findings indicated the prevalence of increased positive student attitudes toward local places through place-based learning experiences (Bertling, 2015; Eilam & Garrard, 2017; Gray & Birrell, 2015; Kuwahara, 2012; Ngai & Koehn, 2010; Smith, 2017) as opposed to negative attitudes. Two studies highlighted instances of negative student attitudes related to specific place-based learning situations, and these negative learning experiences tended to be minimized by positive experiences (Bertling, 2015; Kuwahara, 2012). One study (Smith, 2017) suggested a possible correlation between negative student attitudes toward local place and low socio-economic status. Three studies (Bertling, 2015; Eilam & Garrard, 2017; Ngai & Koehn, 2010) extended analysis of student attitudes toward place to include intended student behaviours after participation in a place-based project, analysis of whether student intentions would have the same behavioural results in a spatially-removed location, (Eilam & Garrard, 2017) and whether student interest in local Indigenous American cultures would result in students' increased interest in learning about additional cultures (Ngai & Koehn, 2010).

Critique and suggestions for further research. Several aspects of the studies reviewed in this section indicate the need for further research in the area of student attitudes. It would be fruitful to compare the variety of existing approaches examined in these studies with other potential curricular approaches to determine if different approaches are equally successful in cultivating positive student attachment to local places. As well, the majority of studies reviewed in this section were somewhat limited in the variables of time and the sizes and compositions of the groups analyzed: several studies only examined one group of students (Bertling, 2015; Eilam & Garrard, 2017; Grey & Birrell, 2015) or examined one school or place-based program over a period of several years, (Kuwahara, 2012; Ngai & Koehn, 2010) or examined the attitudes of larger groups of students over a short time period (Smith, 2017).

Longitudinal studies across a greater variety of local places with a greater variety of student populations and age groups may become more feasible as place-based education gains momentum and more schools establish place-based learning as part of their programs. In connection with longitudinal studies, it would be helpful if researchers did follow-up studies to ascertain student follow-through with their intended pro-social or pro-environmental behaviours after the completion of a place-based program or unit: for example, in Bertling's (2015) study, it would be useful for researchers and educators to know whether students in this case actually followed through with their intentions to recycle as a result of participating in the unit. A deeper understanding of the correlation between place-based education and student behavioural outcomes after the completion of studies could provide a more detailed analysis of the importance of place-based education by determining whether or not students met attitudinal and behavioural goals.

Eilam and Garrard (2017) suggested that the development of place-based learning outcomes may be limited through space and time. They also suggested that since the alignment between environmental attitudes and student behaviour seems to be fragile, there is a need to further examine strategies for strengthening such connections over time and space (Eilam & Garrard, 2017). Perhaps increased research on the emotional connection to place, as recommended by Bertling (2015), would address the issue that learning and behavioural intentions do not necessarily transfer across space and time (Eilam & Garrard, 2017): since emotional connection does appear to exist separately from space and time (Bertling, 2015), is it possible for students to develop similar emotional connections to spatially remote locations or cultural contexts?

Decolonization and Reinhabitation

“My experience of education, from kindergarten to graduate school, was one of coping with someone else’s agenda, curriculum, and pedagogy, someone who was neither interested in my well-being as a kwezens, nor interested in my connection to my homeland, my language or history, nor my Nishnaabeg intelligence... My experience of education was one of continually being measured against a set of principles that required surrender to an assimilative colonial agenda in order to fulfill those principles” (Simpson, 2014, p.6).

Introduction. I have begun this section with a quote from the powerful voice of Nishnaabeg author and academic Leanne Simpson, as her understanding of Indigenous land-based education above illustrates the need for decolonization, reinhabitation, and also reconciliation that place-based articles reviewed in this section addressed. More importantly, I felt it was crucial to begin this section with an Indigenous voice, since the voices of Indigenous researchers were lacking in the empirical research I reviewed.

This second section of the literature review will respond to the question, “How does a program of place-based education facilitate decolonization and reinhabitation?” In the context of place-based education, Gruenewald (2003) explains that decolonization recognizes and works to address the roots of “disruption and injury” when colonization and development have occurred, (p. 9) while reinhabitation is the act of “learning to live well socially and ecologically in places that have been disrupted and injured,” (p. 9) and it also acknowledges the need for reconciliation with both people and the land.

Although none of the articles I examined within this theme or indeed in place-based education as a whole were written by Indigenous researchers, in several cases Indigenous community members took part in place-based project implementation (Kuwahara, 2012; Ngai &

Koehn, 2011; Takano et al., 2009) and seminal Indigenous academics were consulted in person (Takano et al., 2009) or cited, (Harasymchuk, 2015) and some Indigenous teachers were included in research on decolonization (Harasymchuk, 2015). A significant body of cultural and theoretical academic writing by Indigenous authors that can be categorized as place-based education exists; however, these works could not be included since they tend not to be empirical research.

Of the empirical studies I reviewed, five addressed the topics of decolonization and reinhabitation (Buxton, 2010; Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009). Amongst these studies, variation existed in the content areas under focus: two were science-based units (Buxton, 2010; Kuwahara, 2012), with one study focusing on decolonization and reinhabitation without analyzing Indigenous contexts (Buxton, 2010) while the second science-related study combined Indigenous and Western knowledge (Kuwahara, 2012). Two more studies focused on Indigenous Education contexts, (Ngai & Koehn, 2011; Takano et al., 2009) but with differing populations: 80% of the students in the Montana school in Ngai and Koehn's (2011) study were Non-Indigenous, whereas in the second study at a remote Alaskan school, all students but one, were Indigenous (Takano et al., 2009). Across the studies I reviewed, Harasymchuk's (2015) doctoral thesis provided the most thorough analysis of this topic through interviews with place-based education teachers who were aware of and taught Indigenous and decolonization-based content and provided place-based experiences regularly in Saskatoon, Canada, and Christchurch, New Zealand.

In my review of decolonization and reinhabitation in place-based education, I discovered four themes: the structure of programs and curricula contributes to supporting decolonization and reinhabitation, (Buxton, 2010; Harasymchuk, 2015; Takano et al., 2009) teachers' pedagogies

affect students' awareness of decolonization and reinhabitation, (Buxton, 2010; Harasymchuk, 2015; Ngai & Koehn, 2011; Takano et al., 2009) teachers need to develop their own ongoing understandings of decolonization and reinhabitation in order to teach on these topics, (Harasymchuk, 2015) and studies provided support for decolonization and reinhabitation as key components of place-based education (Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009).

Review.

Reorganization and reimagination of time, space, and scheduling to support decolonization and reinhabitation. In structuring programs and curricula to best support student learning on decolonization and reinhabitation, researchers found that teachers or entire programs reorganized space and school time or scheduling (Harasymchuk, 2015; Takano et al., 2009) to create flexible programs centred around place-based learning (Buxton, 2010; Harasymchuk, 2015; Takano et al., 2009).

In Harasymchuk's (2015) research of how a small group of place-based education teachers in Canada and New Zealand "resisted neocolonizing practices," teachers used time and space to respond to the challenges of traditionally-controlled education systems (p. 195). Teachers identified school administrators as the main barrier to reorganizing space and time in their schools by curbing teachers' efforts to challenge the status quo, (Harasymchuk, 2015) which the researcher suggested may be due to the "engrained perception" (p. 195) that learning only takes place inside schools. Harasymchuk's (2015) findings suggested the need to view learning in community as "transparent" (p. 196): he proposed that learning in community is observable to everyone and therefore may hold students and teachers more accountable than classroom learning. In addition, Harasymchuk (2015) found that Indigenous Māori teachers and

Non-Indigenous Canadian and New Zealander place-based education teachers reflected a preference for flexibility in time use that mirrored the nonlinear, cyclical sense of time present in Indigenous worldviews (Harasymchuk, 2015, p. 196).

Buxton's (2010) critical place-based summer science program also demonstrated a flexible structure in the sense that it was not restricted to the confines of a school year schedule or by learning standards. Additionally, Buxton's (2010) lessons took place at an urban seaside nature centre, an ideal setting for learning about decolonization and reinhabitation in the context of water use (Buxton, 2010). In the other two studies reviewed under this subtheme, flexible timing of learning within the school year allowed teachers to take advantage of outdoor and community learning opportunities that were only available at specific times (Harasymchuk, 2015; Takano et al., 2009). When flexible timing was made possible, teachers had the freedom to deliver content based on students' interest and energy levels, rather than moving on to new topics at predetermined times (Harasymchuk, 2015). To create a meaningful sense of place for students in classrooms, some teachers modified traditional classrooms and others used or created unconventional classroom spaces (Harasymchuk, 2015, p. 197).

Takano, Higgins, and McLaughlin's (2009) study illustrated how a land-based, Yup'ik cultural program for grades six to twelve could provide a framework for academic subjects, rather than traditional academic subjects being the basis for place-based learning. Land-based subsistence activities were flexibly planned by taking seasonal activities into consideration, as seasonal changes could affect the availability of certain natural resources for activities. Shorter land-based subsistence activities at Russian Mission School followed the school day schedule, with longer experiences lasting one or two nights and culminating in a one to two-week journey (Takano et al., 2009). While out on the land, students used journals and cameras to document

their activities to review upon their return. Academic classroom work mostly involved writing, researching and editing based on data and materials from outdoor work (Takano et al., 2009, p. 351).

How pedagogy promotes student awareness around decolonization and reinhabitation.

Four of six studies reviewed under the theme of decolonization and reinhabitation support this subtheme (Buxton, 2010; Harasymchuk, 2015; Ngai & Koehn, 2011; Takano et al., 2009).

Successful pedagogies that promote student awareness of decolonization and reinhabitation include “dialogic” teaching, (Buxton, 2010) experiential learning, land-based learning (Harasymchuk, 2015; Takano et al., 2009), inquiry based, project-based, thematic-based learning, (Harasymchuk, 2015, p. 243) and teaching for “critical democracy” (Ngai & Koehn, 2011). Three of four studies also acknowledged community building as a significant factor in their curriculum (Harasymchuk, 2015; Ngai & Koehn, 2011; Takano et al., 2009).

Buxton’s (2010) “dialogic” teaching approach involved engaging students in natural conversations about decolonization and reinhabitation in the local area, which also emphasized his status as a learner along with the students. Buxton (2010) only provided direct teaching when instructing students on the use of scientific tools. Although this study addressed decolonization and reinhabitation from the perspectives of marginalized groups, learning did not reference or include local Indigenous cultures (Buxton, 2010).

In Harasymchuk’s (2015) interviews with teachers in Saskatoon and Christchurch, teachers in place-based programs tended to deliver curriculum predominantly through experiential learning (p. 242). In some cases, whole programs in Saskatoon and Christchurch were centered on place-based learning pedagogies, while in others, place-based learning was delivered within subject-based learning (Harasymchuk, 2015). In addition, flexible assessment

allowed teachers to choose assessment styles that they preferred to standards-based methods of providing feedback (Harasymchuk, 2015).

Ngai and Koehn (2011) used the term “critical democracy” to convey a similar understanding to Gruenewald’s (2003) terms decolonization and reinhabitation. They describe critical democracy as thinking that involves acknowledging complexity, understanding connections among inequities and rights, growing from local diversity, imagining other ways of being, unlearning “dominant assumptions,” considering other perspectives, and learning about opportunities for justice in local communities (Ngai & Koehn, 2011, p. 250). While its partner study (Ngai & Koehn, 2010) focused on student attitudes towards Indigenous peoples in a school with an 80% non-Indigenous population, Ngai and Koehn’s 2011 study analyzed the same place-based program with a focus on critical democracy education. In coding the results of interviews and observations, the researchers (Ngai & Koehn, 2011) found that teachers’ instructional approaches, which they grouped as “customary” (p. 253) or “boundary-breaking,” (p. 253) impacted students’ learning. “Customary” teaching often relied on the use of mainstream texts, lessons were often limited to past lifestyles of Indigenous peoples without critical examination and included occasional guest speakers from local tribes (p. 253). “Boundary-breaking” teaching involved engaging students in conversations and reflections on social justice, cultural identity, social change service-learning, treating Indigenous experts as teaching equals, and rigorous academic learning through Indigenous Education for All (Ngai & Koehn, 2011, p. 253). Ngai and Koehn (2011) found that the “customary” approach promoted a stronger cognitive learning base (p. 260), including an improved sense of place and knowledge of deconstructing stereotypes of Indigenous peoples and cultures, (p. 265) while the “boundary-breaking” approach provided a stronger emotional and personal learning base (p. 260) through critical thinking in conversations

about diversity, learning and relating to people of different backgrounds, incorporating marginalized perspectives in learning, and change-directed social action (p. 265). Research suggests that the two approaches are complementary, and if combined, they might deliver greater balance between cognitive and emotional learning in critical democracy education (Ngai & Koehn, 2011).

Higgins, and McLaughlin's (2009) study on teacher pedagogy in Takano, focused on culturally appropriate, interdisciplinary teaching through land-based experiences and classroom learning connected to land experiences, which was a successful approach to span the historical gap that existed between the school and community. The philosophy at Russian Mission School was to help students increase their self-esteem by building a connection with, or reinhabiting, their own environment (Takano et al., 2009).

Four of six studies specifically mentioned relationship-building with local community members, particularly Indigenous peoples, as essential to a curriculum focused on decolonization and reinhabitation (Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009). These four studies included building strong relationships with students, administrators, parents, and the community, but also focused on building a relationship with the land, often from the perspective of Indigenous land-based relationships, including First Nations and Métis worldviews in Saskatoon, Māori perspectives in Christchurch, (Harasymchuk, 2015) Indigenous Hawai'ian understandings of land, (Kuwahara, 2012) Flathead tribes' traditional ways of knowing in Montana, (Ngai & Koehn, 2010 & 2011) and Yup'ik worldviews in Alaska (Takano et al., 2009). Harasymchuk (2015) found that through developing deep personal connections to the land, students also deepened their relationship to the learning content; likewise, as a result of deepening their relationship to community and land, students at Russian Mission School

improved their self-esteem and their learning in respect to academic learning outcomes (Takano et al., 2009).

Teachers' understandings of decolonization and reinhabitation. Harasymchuk's (2015) study went beyond the scope of the other studies in this section, which mostly assessed the impacts of decolonization and reinhabitation on student learning, to examine teachers' conceptualizations of and uses of decolonization and reinhabitation in their teaching. Most teachers in Harasymchuk's (2015) study demonstrated understanding of decolonization and reinhabitation, and referenced these definitions in terms of breaking down colonial constructs by using culturally-responsive pedagogies. Harasymchuk (2015) noted that four teachers moved beyond the focus of colonialism to include other types of marginalization in their teaching, including awareness of racism, sexism, and homophobia (Harasymchuk, 2015, p. 274). In addition to learning in local contexts, some teachers provided experiences for students to learn about decolonization, reconciliation, and marginalization in national and international discourses. Teachers reflected that place-based learning about colonization acted as strong link to learning about other social justice issues (p. 274). Harasymchuk's (2015) interview findings revealed that individual teachers' cultures, backgrounds, and life experiences affect their understanding of decolonization in education (p. 274). Teachers defined decolonization as a personal journey, the value of which people can only understand by experiencing it for themselves (p. 275).

Why decolonization and reinhabitation are critical in the context of place-based education. Five articles reviewed in this section provided reasons why decolonization and reinhabitation are crucial to the authentic enactment of place-based education (Buxton, 2010; Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009). Three of five studies focused on the importance of decolonization and reinhabitation being carried out through

Indigenous content learning (Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009) while one study focused on decolonization and reinhabitation in the local society without specific reference to Indigenous perspectives (Buxton, 2010) and a fifth study (Harasymchuk, 2015) included Indigenous and other marginalized perspectives as part of decolonizing and reinhabiting schools and classrooms.

In the five studies examined under this subtheme, reasons for promoting the inclusion of decolonization and reinhabitation in place-based education included Indigenous students restoring their connection with the land (Kuwahara, 2012; Takano et al., 2009) and subsequently developing improved self-esteem (Takano et al., 2009) and improved academic learning outcomes; (Kuwahara, 2012; Takano et al., 2009) providing opportunities for Indigenous student voices in academic content learning, (Kuwahara, 2012; Takano et al., 2009) Indigenous and Non-Indigenous students developing an improved attachment to local place by learning about and through Indigenous knowledge, (Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009) improved results in relation to learning outcomes in science, (Buxton, 2010) math, reading, and writing (Takano et al., 2009) as a likely result of participating in decolonization and reinhabitation, and successful school or teacher attempts for reconciliation with Indigenous communities through place-based programs (Harasymchuk, 2015; Ngai & Koehn, 2011; Takano et al., 2009).

Indigenous students restoring their connection to the land and increased Indigenous student voice in content area learning. Two studies specifically addressed students restoring their connections with the land (Kuwahara, 2012; Takano et al., 2009). At Russian Mission School, the principal expressed the school's understanding of the need to "restore" (Takano et al., 2009, p. 355) Yup'ik students' connections to the land, or reinhabit the land, due to the belief

that younger people in the town exhibited greater disconnection from their environment and often lacked subsistence skills (Takano et al., 2009). The principal considered subsistence skills for Yup'ik students necessary to their survival in the harsh local climate and believed that disconnection with the land might threaten student identity and self-esteem (p. 355). The place-based program at Russian Mission School successfully enabled students to reinhabit the land through a flexible place-based learning structure and land-based pedagogy (Takano et al., 2009).

Likewise, Kuwahara's (2012) place-based science program was founded on Indigenous Hawai'ian culture or Traditional Ecological Knowledge (TEK) integrated in science education to encourage students' connections to local places. Kuwahara (2012) explained how minority and low-income students' knowledge is often devalued in traditional schooling because their intelligence often does not match typical western definitions of intelligence (p. 193). By including Indigenous TEK in place-based science teaching, marginalized Indigenous students have a voice to engage in science learning when TEK is respected to the same degree as Western science (p. 193-194).

Improved “place attachment” for all students participating in decolonization and reinhabitation. Although place attachment or positive connections to local places were discussed in depth in the previous section of this review, three of five studies under the theme of decolonization and reinhabitation show some significant overlap with the theme of student attitudinal outcomes (Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009). For example, and the end of the five-year longitudinal study of Russian Mission School, (Takano et al., 2009) students explained that they felt nature was their “home,” (p. 360) and confirmed that subsistence learning made school more enjoyable (Takano et al., 2009, p. 363). Similarly, in Kuwahara's (2012) Hawai'ian place-based study, students reported that field trips helped them learn, changed

their perspectives about the environment, and improved relationships, while Ngai and Koehn (2010 & 2011) found that students' attitudes towards local Indigenous peoples improved over the course of the implementation of an Indigenous Education place-based program.

Improved academic outcomes as a result of decolonization and reinhabitation. Two studies cited improved academic or program outcomes as a result of decolonization and reinhabitation studies (Buxton, 2010; Takano et al., 2009). In his critical place-based summer program, Buxton (2010) focused on the role of water in human health and well-being. Although the topic was grounded in science, there was a strong emphasis on community and social implications of learning (p. 124). To measure the decolonization and reinhabitation portion of students' learning, Buxton (2010) used pre and post-unit student interviews, which he open-coded to ascertain whether critical place-based pedagogy helped students to “identify actions to decolonize and reinhabit their lived environment” (p. 127). Student interview comments provided evidence that decolonization and reinhabitation were becoming part of their thinking: for example, students demonstrated awareness of inequities between communities by explaining how preventative healthcare might be more equitable than curative healthcare for the economically disadvantaged, (p. 130) by making calls for individual action and governmental accountability on certain local issues, and by critiquing gender roles (p. 129). He concluded that critical place-based opportunities provided the opportunity for a diverse group of middle school students to improve their learning in the areas of decolonization, reinhabitation, and science (p. 130).

In the case of Russian Mission School, learning through reinhabiting their land enabled Yup'ik secondary students to improve in core subject areas such as math, reading, and writing (Takano et al., 2009). By the end of the study, the averages for grade 7 and 8 reading, writing,

and math at the school demonstrated steady growth in comparison to the general trend for students across the state (Takano et al., 2009). Other results at Russian Mission School that suggested a focus on reinhabiting the land was a positive experience for students included fourteen previous dropouts returning to school, fewer students coming to school late, and increased positive attitudes towards being at school (Takano et al., 2009).

Teacher and school attempts at reconciliation. Two studies reflected on how decolonization and reinhabitation teaching in place-based education can be a venue for teachers and schools to engage in reconciliation with Indigenous populations. For example, the principal at Russian Mission School recognized that the school was part of a system that was responsible for breaking down the community, self-esteem, and Indigenous language and cultural customs. Therefore, the land-based subsistence place-based program at Russian Mission School was designed with the hope that repeated experiences in the environment over the duration of the school year would help Yup'ik students re-establish their connection with the land (Takano et al., 2009). At first, the school experienced challenges involving community members in their program, since some questioned the value of subsistence learning and thought students should be learning how to earn money; (Takano et al., 2009) however, as the community observed the school's success with land-based practices, community involvement increased from zero to ten volunteers in a five-year timespan. In follow-up interviews, the results of centering the curriculum around reinhabitation included the community seeing the school as a supporter of community values, parents appreciating subsistence opportunities provided by the school, (p. 356) families eating a larger proportion of "land food" than before the place-based program was implemented, (p. 357) students' improving significantly according to academic outcomes in reading, writing and math (p. 357), improvements in community-school staff relationships,

greater student involvement in learning, and students demonstrating greater confidence and knowledge of land-based skills (p. 358).

In Harasymchuk's case study, several Canadian and New Zealander teachers reflected on reconciliation: for example, a teacher from New Zealand suggested that decolonization should involve honouring the Treaty of Waitangi, and others proposed that schools become culturally responsive to all students (p. 276). Based on these findings, Harasymchuk (2015) proposed that teachers would benefit from critical reflection on decolonization and reinhabitation, and emphasized that non-Indigenous settlers especially need to be aware that "any action put forward is part of the decolonization or recolonization process," (p. 276) meaning that we need to be cognizant of the pedagogies we use and whether or not they truly promote decolonization.

Discussion.

Summary. Section two of the literature review examined place-based education literature in relation to Gruenewald's (2003) terms decolonization and reinhabitation, which are key components of his "critical pedagogy of place". Four sub-themes were apparent in my review of place-based research on this topic, including how the structure or de-structuring of programs and curricula can support the processes of decolonization and reinhabitation (Buxton, 2010; Harasymchuk, 2015; Takano et al., 2009), how teachers' pedagogies affect students' awareness of decolonization and reinhabitation, (Buxton, 2010; Harasymchuk, 2015; Ngai & Koehn, 2011; Takano et al., 2009) the need for teachers to undertake their own personal journeys of decolonization and reinhabitation, (Harasymchuk, 2015) and proof that supports why decolonization and reinhabitation are necessary components of any place-based education program (Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009).

As a whole, findings under the sub-theme of program structure supported the following conclusions: “deschooling” or centering school programs around place-based experiences, rather than integrating place-based experiences in a classroom setting, seems to be more effective in emphasizing decolonization and reinhabitation: when teachers and administrators centre programs around place-based education and include flexible timing and learning spaces, they provide students with the experience of decolonizing and reinhabiting their classrooms and the land (Buxton, 2010; Harasymchuk, 2015; Takano et al., 2009).

Teachers’ pedagogies are linked to a program’s structure, and pedagogies that were effective in modeling decolonization and reinhabitation when combined with a place-based centred program included “dialogic” teaching, (Buxton, 2010) experiential learning, (Harasymchuk, 2015) critical democracy education through a combination of “customary” and “boundary-breaking” approaches, (Ngai & Koehn, 2011) and land-based subsistence learning (Takano et al., 2009).

Reasons for creating place-based education programs centred on decolonization and reconciliation included recognizing Indigenous students’ histories, cultures, and voices, with subsequent improvements in students’ connections and self-esteem; (Kuwahara, 2012; Takano et al., 2009) improved academic outcomes for Indigenous and Non-Indigenous students in science, (Kuwahara, 2012) Non-Indigenous students in science (Buxton, 2010) and Indigenous students in math, reading and writing (Takano et al., 2009) as a result of reinhabiting the land; (Kuwahara, 2012; Takano et al., 2009) increased attachment to local place for both Indigenous and Non-Indigenous students by learning about and through Indigenous knowledge; (Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009) and opportunities for teacher, school, and

student reconciliation with Indigenous communities (Harasymchuk, 2015; Ngai & Koehn, 2011; Takano et al., 2009).

Critique and suggestions for further research. As mentioned in the introduction, more research by Indigenous researchers through collaboration with Indigenous communities in the areas of decolonization, reinhabitation, reconciliation, and the inclusion of Indigenous Knowledge in place-based education and land-based education is crucial. Harasymchuk (2015) recommended further research is needed to compare differing perceptions of decolonization for Indigenous and Non-Indigenous peoples. These experiences would tend to be very different, and likely have an enormous impact on education considering that Indigenous peoples have often lived decolonization from a much earlier point in life, and also considering that colonial history in Canada was and sometimes is still taught from a one-sided, Eurocentric viewpoint. Research demonstrates that that decolonization and reinhabitation are crucial aspects of critical pedagogy of place, (Gruenewald, 2003) and can be best reinforced through the inclusion of local Indigenous Knowledge, and ideally, through Indigenous Knowledge Keepers in place-based learning (Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009). For example, students' understandings of decolonization and reinhabitation in Buxton's (2010) place-based unit on water quality could have been further extended by including local Indigenous peoples' perspectives on water. In addition, research supports the participation of Indigenous community members in place-based programs as having positive effects on students' attitudes toward Indigenous peoples: Ngai and Koehn (2010) found that regular person-to-person contact between students and community members was an important factor in students' positive attitudinal increases towards Indigenous Americans.

The significance of teachers undertaking their own journeys of decolonization and reinhabitation (Gruenewald, 2003) cannot be understated: in the words of teachers participating in Harasymchuk's (2015) study, teachers can "only understand the value of this praxis by undertaking their own journeys of reflections and insight" (p. 275). This statement is true for me personally, and I understand my own journey of decolonization and reinhabitation through learning about local Indigenous cultures and histories as one that I can model for other teachers who are embarking on their own journeys. Harasymchuk (2015) poses an essential question: "What can be done to ensure this cycle (of decolonization and reinhabitation) continues and grows stronger through critical reflection, without descending into forms of recolonization in schools?" (p. 77). Harasymchuk's (2015) research suggests the need for continual learning and professional development for teachers on the topic of decolonization and reinhabitation, as well as reconciliation with local Indigenous peoples.

There is also a need for further longitudinal studies in the area of decolonization and reinhabitation in place-based education. Two studies (Takano et al., 2009; Ngai & Koehn, 2011) assessed the growth and development of place-based education programs based on Indigenous cultures over a five-year period, and similar studies comparing and contrasting Indigenous Education-based programs across various regions would be useful for ascertaining useful strategies for decolonization and reinhabitation.

School-Community Collaboration in Place-Based Education

The third question that I will analyze in this literature review is "Which characteristics of school-community collaboration are effective or ineffective in place-based education?" Seminal authors in the field of place-based education suggest that community participation in schools and the participation of schools in community life are essential to place-based education, and that its

goals are best served by flexible boundaries between schools and communities (Smith, 2002; Gruenewald, 2003). For example, one of Smith's (2002) five characteristics of place-based education is community learning where students ideally move fluidly between the school and the community. Although some community-school interaction processes described in the empirical literature are specific to local places, many of these practices are generalizable to educational systems across localities.

The articles I reviewed on the theme of school-community collaboration focused on practices that support or hinder the implementation of place-based education. This theme warranted a section in the literature review since four studies focused specifically on community and intergenerational elements of place-based education (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009). The school-community collaboration section of this literature review contains two subsections: certain community-school interactions tend to support the implementation of place-based learning, while other community-school interactions tend to hinder the implementation of place-based learning.

Community-school interactions that support place-based education. Each of the empirical articles stated local reasons for implementing place-based education, which affected how community-school relationship building was approached in each case. All of the studies in this section shared the goal of preservation of local community knowledge and values through working in collaboration with community (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009). For example, in one study (Howley et al., 2011), staff of a rural school, Island Community School, and community members understood environmental and place-based education strategies as essential to the "survival" (p. 224) of the community: this particular school is located on an island and local culture is distinct from that of

the mainland United States. Each of the other studies focused on specific reasons for using place-based education and working with community, including improvement of school image and intergenerational learning, (Mannion & Addey, 2011) developing understanding of a local watershed and its economy by learning from landowners, (Santelmann et al., 2011) and providing a culturally-relevant learning environment for at-risk Hawai’ian students (Yamauchi & Purcell, 2009).

Although the schools involved in each of these empirical case studies provided different reasons for implementing place-based education strategies, they shared a number of effective strategies for developing relationships and learning with local communities, including working with volunteers and non-profit organizations to build school-community connections (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) through effective communication and collaboration (Howley et al., 2011; Yamauchi & Purcell, 2009), by facilitating a permeable boundary between the school and community, (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) by providing administrative support, (Howley et al., 2011; Yamauchi & Purcell, 2009) and by promoting flexible teacher roles throughout a school (Howley et al., 2011; Yamauchi & Purcell, 2009). In the following sections I will address each of the subthemes listed above.

Volunteers, community involvement, and community-school communication. All four of the studies under the school-community collaboration theme involved community members in various place-based activities and projects. Roles of volunteers and community members depended on local contexts and needs, and included direct instruction, co-teaching, co-planning, field-trip supervision (Howley et al., 2011; Yamauchi & Purcell, 2009) student-volunteer interviews (Santelmann et al., 2011), field-trip supervision, (Howley et al., 2011) supervision and

creation of community service-learning opportunities, (Yamauchi & Purcell, 2009) political support for programs, (Howley et al., 2011; Yamauchi & Purcell, 2009) providing funding for programs, (Howley et al., 2011; Yamauchi & Purcell, 2009) providing cultural consultation and culturally-relevant professional development for teachers (Yamauchi & Purcell, 2009) or mentoring and participation across generations (Mannion & Addey, 2011; Santelmann et al., 2011).

Only one of the four studies reviewed under this theme (Yamauchi & Purcell, 2009) specifically analyzed aspects of successful communication between a place-based school program and community partner-groups. In the Hawaiian Studies Program, Yamauchi & Purcell (2009) included weekly planning meetings between a teacher and members of four community organizations, which met to discuss the development of the program and partnership activities between the school and these organizations (Yamauchi & Purcell, 2009). The findings of this study suggested that frequent meetings are essential to sustaining relationships between schools and partner groups and facilitating the building of common values, and that relationships with community organizations were sustained because the place-based science program also met the needs of the community organizations involved (Yamauchi & Purcell, 2009). Other significant findings of this study (Yamauchi & Purcell, 2009) were that flexible work schedules allowed community members participating in the HSP to make service learning activities with students part of their regular jobs, and that the leadership of one of the community organizations, Ka'ala Farm, assisted the program in recruiting most of the other community groups (Yamauchi & Purcell, 2009).

Permeable boundary between school and community. Additionally, the four empirical case studies reviewed all promoted a flexible boundary between communities and schools: in

many instances, in the place-based learning programs examined, community members performed their roles outdoors on school grounds, (Mannion & Addey, 2011) students were out in the community (Santelmann et al., 2011), or volunteers participated in indoor and outdoor school activities and students went out to work with volunteers in the community (Howley et al., 2011; Yamauchi & Purcell, 2009). Community volunteer participation enabled flexible boundaries between schools and communities in all four of the studies. Projects undertaken by communities and schools included long-term projects, such as recycling and boat-building at Island Community School (Howley et al., 2011); intergenerational work between parents and students in a school garden (Mannion & Addey, 2011); weekly service-learning in the community and cultural learning outside (Yamauchi & Purcell, 2009); and visits to the properties of local landowners to understand a watershed and its connection to the local economy (Santelmann et al., 2011).

The direct benefits of a flexible boundary between school and community that are supported by the literature include students finding connections between academic and community learning or values, (Howley et al., 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) the development of intergenerational understanding and the creation of a shared future between students and the community, (Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009), and the successful improvement of a “rough” school’s image and improved attendance via an intergenerational school garden project (Mannion & Addey, 2011).

Administrative support and leadership. Two of the studies suggested that effective leadership approaches and support from school principals are essential to the implementation and sustainability of place-based programs (Howley et al., 2011; Yamauchi & Purcell, 2009). In the case of Island Community School, (Howley et al., 2011) the principal advocated for students

participating directly in community life, since community members were not accustomed to seeing students learning in the community. Likewise, the continued existence of the Hawaiian Studies Program (Yamauchi & Purcell, 2011) required lobbying on the part of teachers to convince a new principal of the program's merit.

Teacher roles and experience levels. Two of the four studies in this section investigated teacher roles and approaches that encouraged the successful application of place-based education in regards to interaction with community (Howley et al., 2011; Yamauchi & Purcell, 2009). At Island Community School, the principal explained that he valued a variety of teacher philosophies and viewpoints, including “progressive” (place-based) and “traditional” educational approaches, and saw these as necessary to the implementation of place-based and environmental education (Howley et al., 2011). In addition, school staff believed students should learn to think for themselves and take responsibility for their learning, rather than participating in rote learning and achieving on standardized tests, and that a place-based school culture should be based on inquiry processes (Howley et al., 2011). The Yamauchi and Purcell (2009) study scrutinized a further aspect of teacher-community interaction, explaining that teachers in a place-based science program primarily functioned as “community brokers” who worked with expert community members to co-teach and co-plan aspects of the curriculum. In both of the above studies (Howley et al., 2011; Yamauchi & Purcell, 2009) teachers and students were co-learners, since teachers did not have background knowledge on many of the topic areas, which were often initiated based on student interest.

Community-school interactions that hinder place-based education. Although the schools in the studies examined in the literature tended to experience positive attempts at community-building, relationships with communities were strained by four main factors:

hostility or lack of support from those outside the program, including community or administrators (Howley et al., 2011; Yamauchi & Purcell, 2009); policy that constrained the development of productive community-school relationships (Mannion & Addey, 2011; Yamauchi & Purcell, 2009); cultural differences or lack of understanding between students and teachers or teachers and community (Howley et al., 2011; Yamauchi & Purcell, 2009); and the confusion of teacher-community roles, which can lead to conflict (Yamauchi & Purcell, 2009). Santelmann et al. (2011) examined the positive aspects of community-building but did not investigate negative aspects.

Hostility or lack of understanding from others. Two studies detailed place-based program experiences with hostility and lack of understanding from either the community (Howley et al., 2011) or the school principal (Howley et al., 2011; Yamauchi & Purcell, 2009). Some community members at Island Community School were unused to seeing students out in the community, and initially questioned the value of a place-based education approach (Howley et al., 2011). As a result, the school principal spent time justifying and explaining this approach to the community, and in the long term, the community did become supportive of the school's initiatives (Howley et al., 2011). The Hawaiian Studies Program (Yamauchi & Purcell, 2009) experienced similar constraints: although its first principal supported a place-based approach, a second principal questioned the program's connection to academic outcomes, which made it challenging for the program to continue. At one point, the second principal reassigned an HSP teacher, which greatly affected the program's capacity (Yamauchi & Purcell, 2009).

Policy constraints. Policy can constrain the development of relationships between schools and their surrounding communities, as exemplified by two studies (Mannion & Addey, 2011; Yamauchi & Purcell, 2009). A Scottish study described policy as a significant barrier to

the development of school-community learning ties (Mannion & Addey, 2011). Other studies mentioned that standardized learning outcomes are understood as potentially interfering with a place-based approach; (Howley et al., 2011; Yamauchi & Purcell, 2009), however, Mannion and Addey's (2011) study provided greater analysis of policy constraints on relationship-building. The researchers concluded that although Scottish educational policies allow flexible movement between schools and communities, and the new formal curriculum encourages outdoor learning, this model does not specifically support intergenerational place-based learning (Mannion & Addey, 2011, p. 53). The inherent challenge within Scottish policy is that it promotes the use of resources inside and outside of schools to advance student achievement, but outside of schools, policy is directed toward job and skill-building economic activities for youth and adults: resources are not allocated to provide civic experiences for younger students (Mannion & Addey, 2011).

The Hawaiian Studies Program discussed by Yamauchi & Purcell (2009) was affected by policy in the context of a changing socio-political context (p. 186): the program began before the American No Child Left Behind policy had been implemented. The No Child Left Behind policy brought a return to standards-based testing in attempt to help all children reach state learning objectives, and its implementation motivated educators to increase students' standardized test scores. NCLB policy posed challenges for teachers in the HSP in planning weekly service learning opportunities for students (Yamauchi & Purcell, 2009).

Community differences in class and culture. Class and cultural differences between the community, teachers, and students have the potential to create conflict if there are challenges in cross-cultural understanding (Howley et al., 2011; Yamauchi & Purcell, 2009). Local economic and cultural differences need to be considered in any place-based learning context. For example,

at Island Community School, (Howley et al., 2011) class and cultural differences existed between the community and student body: the island had a significant wealthy, seasonal population in addition to the year-round, middle to lower-middle class population to which the students belonged. Similarly, the researchers of the Hawaiian Studies Program stressed the importance of educators continually learning about local community culture and students' backgrounds: educators there were likely to be disconnected from school and community culture as most educators came from outside the Indigenous Hawai'ian community (Yamauchi & Purcell, 2009). Differences in values between Hawai'ian community members and educators also contributed to challenges in collaboration efforts, and in cases where shared values were present, the school and community sometimes worked in isolation, which occasionally resulted in a lack of communication (Yamauchi & Purcell, 2009). Likewise, at Island Community School, the researchers (Howley et al., 2011) cited a shared interest between year-round and seasonal residents of the island in keeping the culture and natural environment of the island intact (p. 226). Therefore, even if cultures within a community have contrasting beliefs, a shared interest in students' success tends to promote effective place-based learning programs (Howley et al., 2011; Yamauchi & Purcell, 2009).

Teacher and community roles and potential conflict. Only one study cited potential interpersonal conflict between teachers and community members as being a source of conflict in place-based education (Yamauchi & Purcell, 2009). Through their work with the Hawaiian Studies Program, Yamauchi and Purcell (2009) found that community leaders may experience frustration if educators are reluctant to share decision-making roles, particularly when deciding leadership roles at community-school meetings. In addition, place-based programs may have higher instances of teacher burnout, since place-based program teachers tend to demand more

personal time from the average high school teacher (Yamauchi & Purcell, 2009). Effective place-based programs require extra time to communicate with community partners, to facilitate service learning, and to develop an integrated curriculum with community input (p. 182-183). As a result of teacher burnout, the Hawaiian Studies Program experienced a high teacher turnover: over three years, eight teachers left the program (Yamauchi & Purcell, 2009).

Funding issues. Two of four studies mentioned how funding can pose a challenge to relationships with community in place-based education (Howley et al., 2011; Yamauchi & Purcell, 2009). Place-based programs often rely on outside funding and resources, which may be challenging to secure, in order for community participation and field trips to take place (Howley et al., 2011; Yamauchi & Purcell, 2009). In the case of Island Community School, complex and extensive place-based projects required external funding, use of school resources, and assistance from community experts (Howley et al., 2011). At this particular school, wealthy seasonal island residents contributed large sums of money, which was beneficial for place-based education at the school; however, the year-round community tended to feel resentful of this dependence on wealthy outside donors (Howley et al., 2011).

The Hawaiian Studies Program (Yamauchi & Purcell, 2009) required funding for transportation of students to service learning sites, and at first, a community organization provided a van and driver to transport students, and later provided funding for two buses. As the HSP teachers and researchers experienced, non-profit organizations can lose funding and personnel without warning, which is a challenge for schools, since these factors affect an organization's capacity to collaborate with them (Yamauchi & Purcell, 2009, p. 185).

Discussion.

Summary. This section of the literature review analyzed specific community-school interactions that support the implementation of place-based education (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) and specific community-school interactions that can hinder its implementation (Howley et al., 2011; Mannion & Addey, 2011; Yamauchi & Purcell, 2009). According to findings from the research cited above, the following aspects tend to support the implementation of place-based education: widespread community volunteer involvement in schools and school involvement in the community, (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) regular communication between schools and community stakeholder groups, support from school administration and the community for place-based education, and teachers taking on the role of “community brokers” (Howley et al., 2011; Yamauchi & Purcell, 2009). Factors that impeded the implementation of place-based education included hostility or lack of understanding of a given place-based program on the part of administrators (Howley et al., 2011; Yamauchi & Purcell, 2009) and community members (Howley et al., 2011); policy constraints that affect the development of community-school connections (Mannion & Addey, 2011; Yamauchi & Purcell, 2009); differences in culture between the school, community, and/or teachers (Howley et al., 2011; Yamauchi & Purcell, 2009); potential teacher-community conflict over teacher and community member roles (Yamauchi & Purcell, 2009); and funding constraints (Howley et al., 2011; Yamauchi & Purcell, 2009).

Critique and suggestions for further research. The longitudinal study by Yamauchi and Purcell (2009) of community connections within the Hawaiian Studies Program provides a strong model to follow for further research in building school-community connections in place-based education. Of the four studies analyzed, this study (Yamauchi & Purcell, 2009) went

beyond initially building community connections to examine factors that sustained relationships between schools and communities. Yamauchi & Purcell (2009) found that it was important to consider the goals of community stakeholder groups so that place-based program goals would also benefit community groups and better sustain the school-community relationship. Additional longitudinal studies are needed in all areas of place-based education, and school-community connections would also benefit from a wider-ranging analysis to ascertain the most successful strategies for maintaining community-school connections over time.

Impact of Place-based Education on Traditional Learning Outcomes.

Introduction. This section of the review will explore three subthemes related to the attainment of traditional learning outcomes in answering the fourth and final research question, “How does place-based education impact traditional learning outcomes?” The three sub-themes in this section include place-based literacy teaching (Donovan, 2016; Waller & Barrentine, 2015), effective place-based teaching practices (Mannion et al., 2013; Silverman & Corneau, 2017; Miller & Twum, 2015) and place-based learning in the core subject areas of environmental science (Buxton, 2010; Muthersbaugh et al., 2014; Zimmerman & Weible, 2015) and geography (Perkins et al., 2010; Pike, 2011; Santelmann et al., 2011).

Literacy in place-based education. Two empirical articles explained how teachers can effectively make place-based connections with students through writing (Donovan, 2016) and reading (Waller & Barrentine, 2015). Although students were not involved in place-based outdoor or community experiences as part of literacy instruction, both studies examined learning about place in the context of traditional, standards-based American learning environments (Donovan, 2016; Waller & Barrentine, 2015). Donovan’s (2016) study specifically cited

improvement in student learning outcomes in writing, while Waller and Barrentine's (2015) research recommended the use of place-based connections in reading instruction.

Donovan's (2016) case study of place-based writing in a grade 7 classroom extended the definition of "place" to include students' personal narratives (p. 23). By writing about their own experiences through an inquiry approach, students improved their writing according to grade-level standards (Donovan, 2016). To measure attainment of learning outcomes, students completed two baseline writing pieces, and Donovan (2016) reported out in detail on three of 22 students who were chosen to represent trends across the group, including an ELL student, a student who struggled socially, and an accelerated student. All three students demonstrated growth in relation to different aspects of the writing standards depending on their needs (Donovan, 2016). According to Donovan's (2016) findings, students are likely to become proficient writers when provided the opportunity to reflect on topics of expertise, such as local places and community. This research lends support to the claim that place-based writing practices can effectively augment a standardized writing curriculum (Donovan, 2016, p. 31).

Waller and Barrentine's (2015) study analyzed rural school teachers' attempts to integrate place-based learning in reading instruction for elementary students. Teachers experienced challenges in helping students make text-to-self connections to local place while using commercial readers (Waller & Barrentine, 2015, p. 8). Findings included a significant discrepancy between text-to-self and text-to-world connections made by teachers and students: place-based text-to-self connections accounted for only 14.9% of the reading connections analyzed in the study, lacked depth, and were not particularly connected to local place (Waller & Barrentine, 2015). Teachers did not take full advantage of their own experience as rural community members when providing reading instruction, and overused commercial reading

programs that did not support making place-based connections (Waller & Barrentine, 2015). To mitigate the use of commercial reading programs in rural settings, the researchers suggested that teachers actively demonstrate place-based connections to their students using “think aloud” strategies (p. 9), and that they utilize local, rural literature when available (Waller & Barrentine, 2015).

The findings of these two studies (Donovan, 2016; Waller & Barrentine, 2015) support the creation of a balanced, place-based literacy program within a standards-based classroom setting. Ideally, a place-based literacy program would include regular opportunities for students to reflect on their own experiences in writing, (Donovan, 2016) and include explicit modeling of place-based connections during literacy instruction, using locally created readers when available (Waller & Barrentine, 2015).

Effective place-based teaching practices. Three empirical studies used teacher interviews and field observations to examine teachers’ successful implementation of place-based education (Mannion et al., 2013; Silverman & Corneau, 2017; Miller & Twum, 2015). Two articles considered teachers’ experiences planning and leading place-based lessons and excursions (Mannion et al., 2013; Silverman & Corneau, 2017) while a third article (Miller & Twum, 2015) noted the importance of modeling place-based education for student teachers.

Overall findings in the area of successful place-based learning implementation included the following: teachers need support and must recognize that they “co-author” place-based curricula with others and with the environment (Mannion et al., 2013, p. 805); they need to develop familiarity with local places and communities (Mannion et al., 2013; Miller & Twum, 2015); participate in professional development (Mannion et al., 2013); personalize place-based education and make opportunities for students to “adventur[e] outside” (Silverman & Corneau,

2017, p. 261); and finally, teachers should create a student-directed atmosphere by integrating inquiry-based learning (Miller & Twum, 2015; Silverman & Cormeau, 2017), risk management skills (Mannion et al., 2013; Silverman & Cormeau, 2017) and accommodation of special needs students (Miller & Twum, 2015). Based on the findings summarized above, two subthemes emerged: teachers most frequently mentioned student engagement and student-centred learning as essential to a successful place-based learning environment, (Mannion et al., 2013; Miller & Twum, 2015; Silverman & Cormeau, 2017) and teachers also valued advance planning and knowledge of local areas, including risk assessment and management (Mannion et al., 2013; Miller & Twum, 2015; Silverman & Cormeau, 2017).

Student engagement and student-centred learning. Student engagement through student-centred learning was a prevalent theme in all three articles (Mannion et al., 2013; Miller & Twum, 2015; Silverman & Cormeau, 2017). All teachers in Mannion, Fenwick, and Lynch's (2013) study valued student-directed activities, while some encouraged student input in trip planning and in negotiating outdoor tasks (Mannion et al., p. 802). Likewise, teachers in Miller and Twum's (2015) study believed that by empowering students to take responsibility for their own learning, place-based education enables students to make choices based on both their interests and curriculum requirements. Student responsibility can lead to motivation increases and positive change in the community (Miller & Twum, 2015), stimulate development (Silverman & Cormeau, 2017), and promote positive behaviour (Silverman & Cormeau, 2017, p. 265). According to teachers in Silverman and Cormeau's (2017) study, (p. 265) hands-on, conservation learning was more meaningful to students than discussions about environmental degradation.

Of the three articles, only Miller and Twum's (2015) research linked assessment to student-directed learning. These researchers (Miller & Twum, 2015) highlighted the need to connect place-based education to standard learning outcomes to ensure that others view it as a legitimate teaching approach. Teachers in Miller and Twum's (2015) study shared the responsibility for assessment with students, and students learned to assess their work through self-assessment, peer assessments, and portfolios (p. 100).

Teacher knowledge and planning for place-based experiences. A second prominent theme in all three studies in this subsection was the need for teachers to plan ahead and develop their professional knowledge of the local area and community (Mannion et al., 2013; Miller & Twum, 2015; Silverman & Cormeau, 2017). Of the three studies, Mannion, Fenwick, and Lynch (2013) provided a detailed analysis of planning. In their observations, several key elements were necessary to the successful implementation of excursions, including collaborative planning visits for teachers to a local place to learn about the area, consider health and safety concerns, and share teaching ideas (p. 798). Also essential was a degree of spontaneity or flexibility in lessons and teacher confidence and enthusiasm for teaching outdoors (Mannion et al., 2013).

Two of the three articles in this subsection outlined the need for risk assessment and management as part of teacher planning in place-based education (Mannion et al., 2013; Silverman & Cormeau, 2017). Novice educators tended to be more concerned about perceived risks than experienced educators, (Mannion et al, 2013) and all teachers need to be mindful of creating learning opportunities that ensure "safety both for the students and the natural environment" (Silverman & Cormeau, 2017, p. 262). In addition, Silverman and Cormeau (2017) explained how teachers created boundaries and expectations, including student-generated

guidelines for appropriate behaviour, so that students could explore safely while also considering their actions and impact on wildlife (p. 263-264).

Improvement of content area curricular outcomes. Six studies focused on content area curricular outcomes in place-based learning, primarily in the subjects of environmental science (Buxton, 2010; Muthersbaugh et al., 2014; Zimmerman & Weible, 2017) and geography (Perkins et al., 2010; Pike, 2011; Santelmann et al., 2011). Overall, findings from empirical studies demonstrated that student achievement of learning outcomes in place-based learning environments met or exceeded learning standards in traditional classroom settings (Buxton, 2010; Muthersbaugh et al., 2014; Perkins et al., 2010; Zimmerman & Weible, 2017).

Place-based environmental science. In the curricular area of environmental science, two studies focused on place-based projects involving local watersheds and water quality, (Buxton, 2010; Zimmerman & Weible, 2017) while a third study explored how art images affected elementary students' perceptions of environmental science concepts through changes occurring in the environment over time (Muthersbaugh et al., 2014).

Watersheds and water quality. Zimmerman and Weible's (2017) study on a three-week watershed unit for grade 9 and 10 students in rural Pennsylvania fostered student engagement in science through a structured inquiry of a local stream, while Buxton's (2010) week-long critical place-based pedagogy-inspired summer program for 10-13 year old students focused on the role of water in human health and well-being. Although both studies were based in learning about watersheds and water quality, (Buxton, 2010; Zimmerman & Weible, 2017) Buxton's (2010) study moved beyond science learning to explicitly emphasize potential social implications (Buxton, 2010, p. 124).

The researchers involved in these two watershed learning experiences used pre and post-study mind maps (Zimmerman & Weible, 2017) and student interviews (Buxton, 2010) to measure attainment of science concept learning in relation to learning standards, and to measure social implications of science learning including whether students had begun to “decolonize” their thinking (Buxton, 2010) or whether science learning created the desire for students to take action in their local watershed (Zimmerman & Weible, 2017).

Zimmerman and Weible’s (2017) analysis of student-created pre and post-study mind maps on watershed ecology (p. 17) revealed that students increased their ecological knowledge by 50%, (p. 17) their use of scientific terminology related to watershed ecology increased, and half of the learners indicated sophisticated understandings of relationships in the watershed through more complex reorganization of their second mind-map (Zimmerman & Weible, 2017). In addition, students gained knowledge of the problems facing their community, and could identify causes of mediocre water quality (Zimmerman & Weible, 2017, p. 25).

While Zimmerman and Weible (2017) found more significant increases in science content learning overall, students in Buxton’s (2010) study had approximately equivalent science knowledge across both interviews (Buxton, 2010, p. 128). However, students in Buxton’s (2010) study demonstrated gains in a few specific areas, such as “environmental risk factors” and “differential risks” (p. 128). These results suggest that although participants’ overall scientific knowledge did not increase significantly, post-unit they could generate more scientifically complete and correct responses to questions on environmental health topics (Buxton, 2010).

Differences existed in whether students in the two water quality studies (Buxton, 2010; Zimmerman & Weible, 2017) could connect their ecological learning to community action. Although the field study portion of Zimmerman and Weible’s (2017) watershed unit included a

walking tour led by local ecology educators and scientists who discussed uses of the watershed, these volunteers did not address the teacher-intended learning outcome of creating civic action plans for the watershed (p. 14-15). Although students' watershed science learning improved, they lacked the understanding to link their learning to tangible civic action (Zimmerman & Weible, 2017). The researchers (Zimmerman & Weible, 2017) hypothesized that this may be because civic action was not explicitly taught, because students may have expected that personal connections should not be part of a school-based activity, (p. 18) and because students' new learning tended to conflict with their parents' ideas about watershed health (p. 24). In order for students to be motivated to take collective action during a watershed study, more community members need to be involved, and most importantly, environmental education must be explicitly linked to civics education (Zimmerman & Weible, 2017).

Buxton's (2010) place-based water quality learning program resulted in decolonization of student thinking that was a closer approximation to a call for civic action than the student attitudes demonstrated in Zimmerman and Weible's (2017) watershed study. (Note that the "decolonizing" portion of Buxton's (2010) study is analyzed in detail in Section 2). This could be because Buxton, (2010) as the coordinator of a summer science program, had the freedom to develop curriculum that suited the aims of critical pedagogy of place and social problem-solving since he was not required to adhere to school-based learning standards.

Images in environmental education. The final study for review in the environmental education section is an outlier in the context of environmental science place-based learning due to its cross-curricular focus on environmental science, social studies, and art (Muthersbaugh et al., 2014). Muthersbaugh, Kern, and Charvoz' (2014) unit included student-created watercolour images representing the present day local environment and the environment at the time of the

explorers Lewis and Clark in the Pacific Northwest, and a subsequent comparison of these images (Muthersbaugh et al., 2014). By having primary students compare past and present environments, the researchers (Muthersbaugh et al., 2014) wanted to discover students' understanding of the environment and to know how they understood the concept of being a "conscientious citizen[s] in the United States" (p. 316). Through analysis of student verbal comparisons of their watercolour paintings, the researchers coded three themes including "student self-perceptions, scientific misconceptions, and critical thinking" (p. 319). Findings included the following: all 24 students expressed positive attitudes and pride towards their creations, they mediated their own understanding of the environment by creating the images, and they tended to have "scientific misconceptions" (p. 320) around challenging concepts, including beliefs about the sun, plants, animals, and extinction (Muthersbaugh et al., 2014). The identification of student misconceptions allowed teachers and researchers to plan additional experiences for students to address these misconceptions (p. 320). Students demonstrated critical thinking in their understanding of the causality of changes in the environment over time, and articulated beliefs of the value of local place and their desire to have positive impacts on the environment (Muthersbaugh et al., 2014, p. 321). This study is significant due to its advocacy for planning lessons to address gaps in students' scientific knowledge, and for its cross-curricular approach to environmental science. However, aspects of this study included some serious flaws that will be addressed in the discussion section.

Place-based geography learning. Of the three studies that focused on learning outcomes in geography, one analyzed the use of GPS and GIS learning to promote spatial literacy in middle schools, (Perkins et al., 2010) a second (Pike, 2011) concentrated on children's uses of their local environments and the subsequent implications for school-based geography learning,

and a third (Santelmann et al., 2011) looked at physical geography and agricultural land management. Of these studies, only the GIS and GPS-based study directly addressed attainment of geography learning outcomes, (Perkins et al., 2010) while Santelmann, Gosnell, and Meyers' (2011) study in Oregon emphasized the power of understanding community viewpoints and land use by working with local landowners, and Pike's (2011) study analyzed Irish students' perceptions of their local environments and made a case for including students' understanding of local places in geography lessons. Aspects that can be compared and contrasted across the three studies include student-created maps and connections to learning standards or outcomes.

A feature shared by all three studies was the inclusion of student-created maps of a local area (Perkins et al., 2010; Pike, 2011; Santelmann et al., 2011). Maps included student-drawn "footprints" of the schoolyard to show improvements in spatial learning, (Perkins et al., 2010) maps were used to capture students' understanding of and movement in their local area, (Pike, 2011) and to orient students and provide a sense of the larger scale in agricultural areas when compared to urban areas (Santelmann et al., 2011).

A study of a GIS and GPS-based unit across 9 middle schools in Maine was the only geography study that specifically analyzed student learning outcomes (Perkins et al., 2010). Students participated in a school wide tree inventory, found patterns using tree measurements, and used GPS and GIS to understand how construction of the school affected tree habitat (Perkins et al., 2010). The researchers (Perkins et al., 2010) compared pre and post-study student drawings of the schoolyard for area and distance measures, and found that although students showed greater improvement in area analysis than in distance analysis, they improved their understanding of the concepts of both "scale" and "proximity," which are key components of spatial literacy (Perkins et al., 2010, p. 217). The researchers suggested that linking place-based

GIS and GPS learning with an outcomes-based ecology unit on succession provides an avenue for GIS learning to become accepted by teachers (Perkins et al., 2010).

Although Santelmann, Gosnell, and Meyers' (2011) geography-based study did not specifically compare student learning to standardized outcomes, when students asked the same interview questions to multiple landowners in the local watershed, they were able to compare the impact of human dimensions on land use. Students' learning demonstrated evidence that they considered individuals' attitudes and philosophies towards management, the legal and political constraints of managing a business, and the economic constraints of local industries in relation to globalization (Santelmann et al., 2011).

Rather than examining how existing place-based teaching addressed standard learning outcomes, Pike's (2011) study examined children's experiences in their local environment and promoted the inclusion of children's place-based experiences in school learning. Pike specifically considered children's use of their local environment in the Republic of Ireland, the contributions of children's experiences in their local environments to their learning and the implications these experiences have for geography learning in school. Pike (2011) compared ten to thirteen-year old children's experiences of local environments through discussion, interviews, and drawings. Overall, student maps of the local environment were well-organized and geographically accurate, students demonstrated awareness of human processes and remembered community members' opinions on local changes. Most of the children's learning about the local environment was "constructed learning," (from their own experiences), while "received learning" (from without) about local place came from home rather than school (p. 151-152). School experiences of local geography learning varied greatly from class to class, and most geography activities were based on passive textbook learning (Pike, 2011). These findings are

reminiscent of Dewey's (1929) assertion that learning should connect to students' home and community learning and not be based solely on school learning. Pike (2011) recommended that children's local experiences be incorporated regularly in geography learning through place-based education, that children's participation in community decision-making be mainstreamed, and finally, that more research with children and their geographical learning is needed.

Discussion.

Summary. In examining the three subthemes of place-based literacy instruction, effective strategies for place-based learning implementation and the improvement of content area curricular outcomes, several conclusions can be drawn about how place-based education tends to affect learning outcomes and how teachers create a learning environment that is conducive to increased student learning in relation to outcomes. In the area of literacy, research demonstrates that place-based writing that includes identity development leads to improved achievement in relation to writing standards, (Donovan, 2016) and that teachers should take advantage of opportunities to connect children to local place through place-based connections in reading instruction (Waller & Barrentine, 2015). Effective strategies for implementing place-based education include collaborative teacher planning and learning about local place (Mannion et al., 2013; Miller & Twum, 2015; Silverman & Corneau, 2017) and the empowerment of students through student-directed learning strategies, such as inquiry (Mannion et al., 2013; Miller & Twum, 2015). In content area place-based learning in environmental science and geography, three studies demonstrated learning that was equivalent to or had increased in relation to standard learning outcomes (Buxton, 2010; Perkins et al., 2010; Zimmerman & Weible, 2017) while other studies demonstrated learning improvements even when they were not necessarily associated with standard learning outcomes (Muthersbaugh et al., 2014; Santelmann et al., 2011). Several

researchers promoted the benefits of including standardized learning outcomes in place-based education, as they believed this would make place-based education more accessible to teachers (Buxton, 2010; Miller & Twum, 2015; Perkins et al., 2010). For the same reasons, some researchers recommended including elements of place-based learning in traditional classrooms (Donovan, 2016; Waller & Barrentine, 2015)

Critique and suggestions for further research. Some researchers cited the need for more cross-curricular, holistic place-based learning, which they thought would potentially develop greater capacity for students to take action in their local communities (Buxton, 2010; Zimmerman & Weible, 2017). To extend Donovan's (2016) and Waller and Barrentine's (2015) findings and thinking around place-based writing and reading strategies, writing could be further linked to place by including outdoor, cross-curricular, and community place-based writing experiences, while local reading materials could be used to enhance cross-curricular content learning across subjects like science and social studies. If local readers do not exist, students could partake in creating reading materials based on local experiences.

Although the research article by Muthersbaugh, Charvoz, and Kern (2014) provided some practical information on the use of student-created images in place-based education, it had potential serious limitations in its theoretical basis and in certain facets of its implementation process. Specifically, limitations included aspects that were left out of the study: for example, the authors cite Gruenewald's (2003) critical pedagogy of place in their references, and explained that students undertook critical thinking, yet in their consideration of the present local environment and the past environment 200 years ago there was no mention of critical discussion by teachers or students of the presence of Indigenous people, even though some students did draw Indigenous people in the "past" environment. Another omission in this study is of the

presence of Indigenous people in the present environment, as if Indigenous people only exist in the past. Furthermore, the “critical thinking” that the researchers mentioned in interview questions with students included questions about the environment and what plants live there (Muthersbaugh et al., 2014), but made no direct mention of any teaching about Indigenous peoples. From the study’s findings, it appears that students commented infrequently on Indigenous peoples’ use of the environment (Muthersbaugh et al., 2014). The above omissions suggest that the teachers and researchers themselves may have had “misconceptions” or were uninformed about Indigenous cultures and history, since they did not mention any extension of teaching concepts in this area as they did when students had misconceptions around science learning.

One article (Silverman & Cormeau, 2017) suggested that research in the field of place-based education should include a “modern redefinition for environmental education,” which would add scientific and civic literacies and community engagement as part of environmental education (p. 270). These authors (Silverman & Cormeau, 2017) also recommended longitudinal studies of children who have participated in place-based education, since existing place-based studies tend to examine specific classrooms and are often limited by the nature of place-based education to individual classes, programs, or locations. As a case in point, four of the studies examined in this section were limited to single classes, (Buxton, 2010; Donovan, 2016; Muthersbaugh et al., 2014; Santelmann et al., 2011) while six studies examined multiple classes of students or groups of teachers (Mannion et al., 2013; Miller & Twum, 2015; Perkins et al., 2010; Pike, 2011; Silverman & Cormeau, 2017; Zimmerman & Weible, 2017). Even the studies that examined a larger cross-section of students or teachers tended to be limited to short-term time frames.

Discussion of the Literature Review.

Summary, significant findings, and questions for further research. This literature review analyzed empirical literature in the field of place-based education across four identified themes in the literature, including the impacts of place-based education on student attitudes, (Bertling, 2015; Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Ngai & Koehn, 2010; Smith 2017) decolonization and reinhabitation in the context of place-based education, (Buxton, 2010; Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009) school-community relationship-building, (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) and student achievement as a result of place-based learning experiences (Buxton, 2010; Donovan, 2016; Mannion et al., 2013; Miller & Twum, 2015; Muthersbaugh et al., 2014; Perkins et al., 2010; Pike, 2011; Santelmann et al., 2011; Silverman & Corneau, 2017; Waller & Barrentine, 2015; Zimmerman & Weible, 2015).

In answer to my first research question, “How does emphasis on a place-based curriculum influence students’ attitudes towards place?” findings indicated that students generally experience overall positive attitudinal outcomes as a result of place-based curriculum (Bertling, 2015; Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Ngai & Koehn, 2010), while negative attitudes were experienced on a situational basis rather than being reflective of students’ overall attitudes towards place-based programs (Bertling, 2015; Eilam & Garrard, 2017; Kuwahara, 2012; Smith, 2017). When students developed positive attitudes, they were more likely to express a desire to care for the local environment (Bertling, 2015; Gray & Birrell, 2015; Eilam & Garrard, 2017; Kuwahara, 2012). However, further research is needed in the area of student behavioural outcomes in relation to positive student attitudes: for example, two studies (Bertling, 2015; Eilam & Garrard, 2017) mentioned possible correlations between students’

positive attitudes and behaviour, but the examination of long-term attitude and behavioural choice correlations was beyond the scope of both studies. In a preliminary way, Eilam and Garrard's (2017) findings suggested that students' positive attitudes towards the environment do not necessary transfer to stewardship-related behavioural outcomes when students move to remote locations. These findings suggest a need for studies in place-based education that continue to monitor students' behaviour towards the environment for several years after they participate in a place-based program. Potential questions for further research are as follows: How do students' positive attitudes towards the environment developed through place-based education affect their behavioural choices in the local environment over time? When students move to other similar locations, do they make similar behavioural choices? How do distance and time affect students' behavioural choices in relation to their attitudes towards place-based education?

Section Two responded to the question, How does a program of place-based education facilitate decolonization and reinhabitation? Factors that facilitated decolonization and reinhabitation included flexible programs centred around place-based learning, where teachers promoted and modeled decolonizing of classroom spaces, time, and curricula; (Buxton, 2010; Harasymchuk, 2015; Takano et al., 2009) certain pedagogical strategies, including "dialogical teaching," (Buxton, 2010) experiential or land-based learning (Harasymchuk, 2015; Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009) and critical democracy teaching (Ngai & Koehn, 2011). Reasons supporting the teaching of decolonization and reinhabitation in place-based education included recognizing Indigenous students' histories and cultures; (Kuwahara, 2012; Takano et al., 2009) improved academic outcomes for Indigenous and Non-Indigenous students in various content areas; (Buxton, 2010; Kuwahara, 2012; Takano et al., 2009) increased place attachment for both Indigenous and Non-Indigenous students by learning about

and through Indigenous knowledge; (Kuwahara, 2012; Ngai & Koehn, 2011; Takano et al., 2009) and place-based programs as opportunities for teachers, schools, and students to participate reconciliation with Indigenous communities (Harasymchuk, 2015; Ngai & Koehn, 2011; Takano et al., 2009). A greater number of longitudinal studies in this area would be beneficial to examine differences between student and teacher attitudes towards and knowledge about decolonization and reinhabitation across Indigenous and Non-Indigenous populations. Questions for further research could include the following: How can teachers begin or progress along their personal learning journeys towards reconciliation? What strategies can help educators develop awareness of colonization in education, to move towards decolonizing practices?” Finally, Indigenous voices in place-based education research must be recognized and encouraged, and the worth of culturally appropriate research that is not necessarily classified as “empirical” also needs to be recognized.

In Section Three, in posing the question, which characteristics of school-community collaboration are effective in place-based education? I found that aspects of school-community collaboration that contribute to relationship-building include widespread community volunteer involvement in schools and school involvement in the community (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) regular communication between schools and community stakeholder groups, support from school administration and the community, and teachers taking on the roles of “community brokers” (Howley et al., 2011; Yamauchi & Purcell, 2009). Factors that did not support community-building included lack of understanding of a program by administrators (Howley et al., 2011; Yamauchi & Purcell, 2009) and community members (Howley et al., 2011), policy constraints (Mannion & Addey, 2011; Yamauchi & Purcell, 2009), differences in culture between the school, community, and/or

teachers, (Howley et al., 2011; Yamauchi & Purcell, 2009) teacher-community conflict over various members' roles, (Yamauchi & Purcell, 2009) and funding constraints (Howley et al., 2011; Yamauchi & Purcell, 2009). All studies analyzed in Section Three were case studies that relied on local school contexts. Yamauchi and Purcell's (2009) longitudinal study of community connections with the Hawaiian studies program is an appropriate model for further research in building school-community connections. Comparative studies analyzing community connections across place-based programs in various regions would be of benefit to compare successful community-building strategies on a larger scale. Questions for further research in this area could include, how can place-based education programs successfully build and sustain community connections over time?

Finally, Section Four addressed the question How does place-based education encourage the attainment of traditional learning outcomes? through the examination of three sub-themes, including literacy (Donovan, 2016; Waller & Barrentine, 2015), effective strategies for implementing place-based education, (Mannion et al., 2013; Miller & Twum, 2015; Silverman & Corneau, 2017) and learning attainment in relation to content area subjects (Buxton, 2010; Muthersbaugh et al., 2014; Perkins et al., 2010; Pike, 2011; Santelmann et al., 2011; Zimmerman & Weible, 2017). The sub-theme of content area learning is likely the most significant to supporting the implementation of place-based education overall, since studies in this area demonstrated the worth of place-based education in relation to learning outcomes, which is essential to educators promoting a place-based program to principals or the community. Overall, research under this theme suggested the need for additional opportunities for cross-curricular, holistic place-based learning, which can promote students taking action in their own communities (Buxton, 2010; Zimmerman & Weible, 2017). Possible questions for further

research could include, how can a cross-curricular place-based program that includes civics education make a difference to students taking action in their communities?

Project Reflection: How does this project connect to research literature in place-based education?

Introduction

My reflection on our work in the grade 3/4 Coast Salish Moons Inquiry Pilot Project in relation to place-based education literature will include the following sections that are directly connected to my literature review: pedagogical choices and unit planning, including inquiry-based learning and pedagogy that models decolonization and reinhabitation (Gruenewald, 2003) by teaching local Indigenous content through local Indigenous perspectives; a review of student engagement and attitudes towards the project; use of literacy strategies; relationship of the unit to content area learning outcomes; and my own journey of reconciliation as a teacher (Harasymchuk, 2015). Considerations for further enactments of this project will be integrated throughout this reflection piece. In consultation with my direct colleague who co-planned this pilot project, we decided to implement the project from February to April 2018 so that I would have the opportunity to reflect on place-based education literature as we created and implemented the project.

Pedagogical Choices and Planning

The pedagogical choices we made in planning and teaching this unit connect directly to two of four themes I examined in my literature review on place-based education, including decolonization and reinhabitation (Section 2) and curricular outcomes (Section 4). This section of my reflection will be divided into four subthemes, including inquiry-based learning and

experiential learning, planning for outdoor lessons, how our work supported pedagogies that reflect decolonization and reinhabitation, (Gruenewald, 2003) and comments on community involvement.

Inquiry-based learning and experiential learning. In the grade 3/4 Coast Salish Moons Inquiry Pilot Project, we based our work with students on experiential learning, (Harasymchuk, 2015), inquiry-based learning (Harasymchuk, 2015; Miller & Twum, 2015; Silverman & Cormeau, 2017) using provocations or manipulatives, and an opportunity for students to explore outdoors (Silverman & Cormeau, 2017), which is also connected to land-based learning (Simpson, 2014; Takano et al., 2009). The two “Core Inquiry” lessons (see Lessons 4 and 5 in the slideshow) and the “Concluding/Celebrating” lessons (see Lessons 6 and 7 in the slideshow) used a variety of manipulatives or provocations related to four themes for the two Coast Salish moons relevant to the season when we implemented the project. The stations for the gallery walk lessons centred on visual images and tangible objects that we expected students would enjoy or would pique students’ curiosity (some examples include miniature canoe paddles, a herring lure with the hook removed, and stuffy frogs and an imitation Coast Salish wool dog).

We scaffolded learning activities in order to release control to students: we began the unit in Lessons 1 and 3 with structured, indoor activities. Activities were structured with the intent of gradually revealing information to students, which we hoped would lead them to “wonder” (Klockars, 2013) about the provocations and lead students to pose questions. An element of surprise was built into most lessons: for example, in advance of the WEXES (Moon of the Frog) lesson, we asked students to bring mugs to school, but we did not tell them they would be trying nettle tea. Likewise, in advance of Lesson 2 (“Forest Ecosystem”), we asked students to dress warmly, but did not tell them what activities we would be doing.

Our teaching style in this unit is comparable to Buxton's (2010) "dialogical" teaching approach, which involved engaging students in natural conversation, with minimal direct teaching. Particularly in Lessons 4 and 5, where students rotated to four theme-based stations on the WEXES moon and PEXSISEN moon (Moon of Opening Hands/Blossoming Moon), teacher conversation with students and modeling of observation, inference, and questioning strategies occurred naturally as I circulated to support students. Classroom teachers, support teachers, and educational assistants were very helpful in this process: the support of additional professionals was beneficial, as they joined student groups at one of the four stations and supported students in their observations, questions, and with writing down questions and observations. Place-based education literature also recommends additional staff to support the implementation of activities (Mannion et al., 2013).

The inquiry model used in our unit can be best described as a "guided" inquiry: although my literature review does not examine the specifics of inquiry-based learning, place-based education literature supports the use of an inquiry model (Harasymchuk, 2015; Miller & Twum, 2015; Silverman & Corneau, 2017). For this project, we applied the model of inquiry-based learning through the 7E model, a culturally relevant model for science learning, (First Nations Education Steering Committee, 2016) and "guided" inquiry (McKenzie, 2016). Our lesson progression followed the 7E model (see slideshow for more details) to model culturally appropriate inquiry-based teaching. McKenzie (2016) describes "guided" inquiry as inquiry in which the "teacher chooses topics/questions, and students design product or solution" (p. 28). We chose the topics of four themes for the two moons, and then supported students in creating their own questions and then in designing and presenting their inquiry products.

Other factors we took into account in planning the unit, were recognizing that we “co-author” (Mannion et al., 2013, p. 805) our place-based curricula with our students, Indigenous knowledge keepers, and the land. Our final two lessons (“Concluding/Celebrating”) will take place after this project is submitted. In the final two lessons of this pilot project, we will need to keep in mind the idea of “co-authoring” with students: students will have more responsibility for their own learning, and there will be increased personalization of student learning (Silverman & Corneau, 2017) as students choose their inquiry questions and decide how to represent their learning.

Planning for outdoor lessons. Lesson 2 (“Forest Ecosystem”) provided an opportunity for students to discover the outdoor environment in a structured setting. In planning and carrying out Lesson 2 we realized the necessity of becoming familiar with local areas (Mannion et al., 2013; Miller & Twum, 2015) around various schools in our district in order to plan for a successful outdoor experience with students and to assess for possible risks (Mannion et al., 2013; Silverman & Corneau, 2017). Although our planning involved some risk assessment, it was not as significant a factor as it was in most outdoor place-based education studies that I reviewed, since the majority of our lessons were held indoors. For the forest lesson, we did take two steps to ensure student safety: classroom teachers paired students with suitable partners who would share iPads and look out for each other while outdoors, and I set a visual boundary in the forest with each class to ensure safety and that all students stayed within teacher sight distance.

Pedagogies that model decolonization and reinhabitation. Studies that I examined in my literature review under the theme of decolonization and reinhabitation (Gruenewald, 2003) supported our pedagogical choices to base our unit on experiential, land-based learning (Harasymchuk, 2015; Takano et al., 2009) and inquiry-based learning (Harasymchuk, 2015).

Although we did not specifically base our teaching on pedagogies associated with “critical democracy,” (Ngai & Koehn, 2011) our work directly reflects the two instructional approaches that Ngai and Koehn (2011) identified in their research on an “Indian Education For All” program at a Montana elementary school. Of all the place-based education studies I reviewed, Ngai and Koehn’s (2011) research may have the most direct connections to our Moons Inquiry project, as the schools in our district tend to have high Non-Indigenous populations, (similar to the 80% Non-Indigenous school population Ngai and Koehn cited in their 2011 study) with higher Indigenous populations at certain schools.

As a result of their research findings, Ngai and Koehn (2011) grouped teachers’ instructional approaches as “customary” (p. 253) or “boundary-breaking,” (p. 253) and found that teachers who used the “customary” approach promoted cognitive learning for students (p. 260), while the “boundary-breaking” approach promoted stronger emotional and personal learning (p. 260). Our approach to the Coast Salish Moons Inquiry project can be understood as a combination of the two approaches, which Ngai and Koehn’s research suggested might provide a greater balance between cognitive and emotional learning in critical democracy and place-based education (Ngai & Koehn, 2011).

Although our teaching tended to focus on cognitive-based learning through Indigenous content (Ngai & Koehn, 2011) and was based on cross-curricular provincial learning outcomes, we avoided negative connotations around “customary” teaching (Ngai & Koehn, 2011). For example, we did not rely on mainstream texts, (Ngai & Koehn, 2011) rather; the texts we used consisted were mostly composed of locally-produced Indigenous readers from Vancouver Island, (Strong Nations Publishing, Inc.) which were at suitable reading levels for the students and included culturally relevant visuals. We avoided limiting our teaching to past Indigenous

lifestyles (Ngai & Koehn, 2011) by making sure to emphasize that many cultural practices in the Coast Salish cultural calendar are ongoing today. In my own teaching, I did this through my use of language when framing questions to students: when discussing the seashore and forest environments in the introductory lesson sequence, I phrased questions to the class in the present tense, for example, “How do you think First Nations might live in relationship to this environment?” This phrasing opens student responses to considering both present and past cultural traditions

Our teaching in the Coast Salish Moons Inquiry project exhibited several aspects of “boundary-breaking” (Ngai & Koehn, 2011) teaching: we did engage students in impromptu conversations and on social justice and cultural identity (p. 253), Elder Earl Claxton Jr. was treated as an equal in our session to co-develop some of the curriculum for the project, (p. 253) social change service-learning, treating Indigenous experts as teaching equals, and the unit featured rigorous academic learning (Ngai & Koehn, 2011, p. 253) through Indigenous Knowledge. Although we touched on social justice (Ngai & Koehn, 2011) by responding to student questions and curiosity about the SENĆOTEN language and language revitalization, this was based more on impromptu conversations that arose than a plan to focus on social justice. We involved WSÁNEĆ Nation Elder Earl Claxton Jr. in the planning aspect of the project and as a “virtual” guest speaker through the recorded clips of cultural information and stories he shared.

The project addressed cultural identity (Ngai & Koehn, 2011) to a greater extent by focusing on seasonal cultural traditions of Coast Salish people, such as cedar bark stripping and cultural uses of the nettle plant. Since the lessons were about and located on traditional Coast Salish Territory, students were able to connect to their own experiences with the environment and their own cultural identities; for example, many students had heard and observed frogs as an

indicator of winter's end, or had touched Stinging Nettle plants before and experienced getting a rash.

One area of “boundary-breaking” teaching that our pilot project did not address was social change service-learning, which was somewhat beyond the scope of this project, since we only had about seven hours over seven lessons booked with each class. As an extension of our pilot project, classroom teachers could find ways to include service-learning in this type of inquiry. For example, during the forest walk, at one school, a few students noticed garbage just outside the school fence, and said, “Some kids think it is okay to throw garbage there, because it's outside the schoolyard”. Environmental cleanup projects or whole-school cultural awareness projects based on the Coast Salish Moons calendar are potential service-learning activities that would connect well to this pilot project.

The mandate of our project was also similar to Kuwahara's (2012) place-based science program in Hawai'i and Russian Mission School's subsistence-style land-based learning program (Takano et al., 2009) in the sense that we planned our lessons to focus on and integrate Traditional Ecological Knowledge, (Kuwahara, 2012) which we believed would serve the dual purpose of providing a voice for Indigenous students in science learning (Kuwahara, 2012) and promote cross-curricular learning, while increasing awareness of Coast Salish cultures for all students. Although “reinhabitation” (Gruenewald, 2003) was not the main focus of our lesson sequence, our unit did result in students developing positive connections to the land through Lesson 2, (“Forest Ecosystem”) and through the fact that our approach was centred on Coast Salish culture and the local environment. Both outdoors and indoors, students had many opportunities to connect to previous experiences through handling familiar objects and participating in familiar activities, (for example, handling seashells and walking in the forest)

and their understanding of Coast Salish culture and the local environment was extended as they were gradually introduced to cultural topics that were likely less familiar to them (for example, the uses of spindle whorls, and the existence of Coast Salish wool dogs).

Place-based education literature under the theme of decolonization and reinhabitation promotes a flexible structure for learning, (Harasymchuk, 2015; Takano et al., 2009) and we did our best to model flexible structure and lesson sequencing, considering that we were visitors in other teachers' classrooms. We decolonized or indigenized curricula by using Indigenous frameworks such as the 7E model, (FNESC, 2016) using local Indigenous resources (Claxton & Elliot, 1993; Strong Nations Publishing, Inc.) incorporating SENĆOTEN language on student graphic organizers, and using culturally appropriate Coast Salish designs on one graphic organizer and in the student Inquiry booklet we created. We decolonized the teaching and learning process to a certain degree as well, by integrating teaching that reflects the First Peoples Principles of Learning, (FNESC, n.d.) particularly the second principle, which states: "learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place" (FNESC, n.d.). Our teaching embodied this particular principle by providing students time to observe the outdoor environment and provocations at the WEXES and PEXSISEN gallery walk stations, discover information for themselves, and in the final lessons, to work together and potentially present their learning to others in the school.

We modified the spaces that were available to us in a short time; for example, we reorganized classrooms for gallery walk activities. In the sense of flexible timing that supports decolonization and reinhabitation in place-based education, (Harasymchuk, 2015; Takano et al., 2009) we created a flexible lesson progression that could be changed depending on weather and

student needs. We are also fortunate to have a very supportive district principal and a good deal of professional autonomy in designing our unit. Several place-based education programs I examined in the literature faced challenges when principals (Howley et al., 2011; Yamauchi & Purcell, 2009) or community members (Howley et al., 2011; Takano et al., 2009) were not initially supportive of or invested in their projects. However, we did not have a great deal of flexibility in timing or scheduling of lessons due to the nature of the program as a pilot project and due to the nature of our schedules: both my colleague and I were limited to about two days per week for the seven weeks to carry out the program with six to seven classes each. In future, we could potentially spend more time with fewer classes to provide greater flexibility in lesson delivery.

Comments on community involvement. Research (Howley et al., 2011; Mannion & Addey, 2011; Santelmann et al., 2011; Yamauchi & Purcell, 2009) and seminal writing (Gruenewald, 2003; Smith, 2002) in place-based education suggested the need for a permeable boundary between schools and the community, and also suggested the need for community building with local Indigenous peoples in place-based learning (Harasymchuk, 2015; Ngai & Koehn, 2010 & 2011; Takano et al., 2009). Our project did include community involvement through the significant contributions of Elder Earl Claxton Jr. to our curriculum, and through holding Lesson 2 (“Forest Ecosystem”) on school and/or community property. However, our opportunities for community-building with schools were limited given the time constraints of our pilot project. I believe that long-term community involvement and flexible school-community boundaries (Smith, 2002) with both local Indigenous and Non-Indigenous communities in place-based learning are most effectively facilitated by individual schools and programs, rather than through a pilot project. At the school district level, there is very strong community involvement

in Aboriginal Education through the Aboriginal Role model program, through which Aboriginal role models visit classes at all levels to present on various topics related to the curriculum.

Through this pilot project and others, we recommend specific role models visit in conjunction with our projects, as we are familiar with the suitability of role models for specific topics.

Student Engagement and Attitudes

This section of my project draws on studies from the themes of student attitudes (Section 1) and learning outcomes (Section 4) of my literature review. Place-based education literature suggests that inquiry-based learning provides opportunities to create a student-directed atmosphere (Miller & Twum, 2015; Silverman & Corneau, 2017). Under the literature review topic of learning outcomes, student engagement and student-centred learning were frequently cited as being as essential to a successful place-based learning environment (Mannion et al., 2013; Miller & Twum, 2015; Silverman & Corneau, 2017).

Although we have not formally surveyed teachers or students about student engagement or positive student attitudes towards the lessons resulting in better connections to local places, (Bertling, 2015; Gray & Birrell, 2015; Kuwahara, 2012; Takano et al., 2009) to date, we have noticed that students are engaged and on-task in all of the lessons, with minimal off-task behaviour. Our pilot project did not include specific social or environmental behavioural outcomes as some place-based studies did (Eilam & Garrard, 2017; Zimmerman & Weible, 2017) but on an implicit level, we intended for students to develop a deeper appreciation of Coast Salish culture and Coast Salish people through participation in the unit. The literature on place-based education also discussed negative student attitudes towards certain place-based experiences (Gray & Birrell, 2015; Kuwahara, 2012; Smith, 2017). In the case of this pilot

project, I did not encounter first-hand any observable negative student reactions, so I would need to interview students to have a sense of any activities in the unit they perceived in a negative light.

I expect that if we were to survey students or teachers on student attitudes and engagement, they would probably comment that they enjoyed Lesson 2 (“The Forest Ecosystem”) the most, with Lessons 4 and 5 (“Core Inquiry Lessons”) using the eight theme-based stations coming in a close second. Students indicated positive attitudes toward the outdoor lesson through comments such as, “Can we do this again?” These positive comments and findings in place-based education literature on positive student attitudes (Bertling, 2015; Gray & Birrell, 2015; Kuwahara, 2012; Takano et al., 2009) suggest that students would benefit from a greater number of outdoor Indigenous Knowledge-based lesson in the next enactment of this pilot project.

Additional outdoor lessons in future versions of this pilot project would potentially deepen students’ sense of connection to place: place-based education literature also cites the importance of a positive local connection to the environment developed through spending time outdoors (Bertling, 2015; Gray & Birrell, 2015). In future Coast Salish Moons Inquiry pilot projects, we could help students develop an emotional connection to the environment by including more lessons outdoors, but more importantly, by including further teachings and demonstrations of cultural protocol and ceremony by Indigenous knowledge keepers outdoors or off-site to help build emotional connections to Coast Salish culture and to local place for students. Although the two studies that made emotional connections to the environment were arts-based, (Bertling, 2015; Gray & Birrell, 2015) I suspect that an outdoor Indigenous cultural approach may have similar emotional effects on students.

One of the reasons we chose to work with grade 3/4 classes is that we are able to follow students from grade 1 and 2 classes that participated in our Aboriginal Literacy Read Aloud Pilot project that we implemented over the past four years. I have made subjective observations that students are able to make connections between their learning across the two pilot programs (grade 1-2 Aboriginal Literacy Read Aloud program and grade 3-4 Coast Salish Moons Inquiry). Student learning from the grade 1-2 program appears to carry over into the grade 3-4 program. In a similar vein to Ngai and Koehn's (2010) research of student attitudes towards Indigenous peoples in a Montana elementary school, it would be useful to research student attitudes and cognitive and emotional learning in connection to Indigenous Education over time across Aboriginal Literacy programs in our school district to assess the impact of our programs. This kind of research would be relevant on a provincial level as well, since it may reveal student progression in relation to increased Aboriginal learning outcomes throughout all levels British Columbia's curriculum (Province of BC, 2018).

Literacy strategies

Since our pilot project was focused on Coast Salish place-based learning, we were fortunate that locally-sourced, culturally relevant literacy materials are readily available on Vancouver Island, primarily through Strong Nations Publishing in Nanaimo. Although our unit focuses more directly on learning about Coast Salish culture through inquiry skills than it focuses on literacy skills, we included literacy skills in our teaching of inquiry skills by supporting students in making rich place-based text-to-self connections (Waller & Barrentine, 2015) throughout the unit. For example, the book Hideaway Cove (Boreham & Timmermans, 2016) featured the local seashore environment, and our preamble to this lesson included asking students to make observations and inferences based on a local beach scene. In addition, at the end of

Lesson 2, (“Forest Ecosystem”) we used a local Strong Nations reader, I Wonder (Klockars, 2013) to model questioning or “wondering” about the local environment. Through these experiences, we repeatedly modeled place-based reading connections to students using “think aloud” strategies, (Waller & Barrentine, p. 9), which are recommended to encourage place-based reading connections. We also used the literacy strategy of making inferences in the introductory lessons as a bridge for students to independently make inferences about items in the WEXES and PEXSISEN gallery walks.

Unlike the two place-based literacy studies I reviewed, (Donovan, 2016; Waller & Barrentine, 2015) the literacy aspect of our inquiry project focused on oral language development rather than reading (Donovan, 2016) or writing (Waller & Barrentine, 2015). We supported the oral language development process with written materials and some written activities. Featuring oral language in lessons is part of indigenizing curriculum, since First Peoples cultures are primarily oral cultures. Following our choice to emphasize oral language, we wanted to encourage natural student conversations (Buxton, 2010) at the gallery walk stations, and to emphasize the value of oral language in local culture through the voice recordings of Elder Earl Claxton Jr. in the PowerPoints that reviewed themes of the two moons. In the final portion of the unit, (“Concluding/Celebrating”) we will provide students with the choice to represent their learning in a format that suits them: some students may choose to do a written project, but we anticipate that many students may choose to create a cultural object, model, diorama, song, story, or do an oral presentation.

If a classroom teacher were to take on this pilot project in their classroom without our support, (which we anticipate may happen after we have modeled the process several times) they could easily extend unit activities over a much longer period of time, such as a whole school year

if they were to use the framework of all thirteen moons. By extending activities over a longer period of time, classroom teachers could engage students in a greater variety of literacy and core subject area activities. For example, Donovan's (2016) study suggested that students' writing improved when it was connected to their identity in relation to local place, and the activities of Lesson 2 ("Forest Ecosystem") could be extended, with opportunities for further observation of the forest and more picture-taking: students could create written pieces from the perspectives of plants or animals, write stories based on a selection of natural pictures, and teachers could use students' forest pictures as general writing prompts in addition to using the photos to provoke student inquiry questions.

Content Area Learning Outcomes

Our pilot project meets the need for cross-curricular, holistic place-based learning experiences, which some researchers thought would potentially provide more opportunities for students to take action in their local communities (Buxton, 2010; Zimmerman & Weible, 2017). Although our project did not specifically focus on taking social or environmental action, its focus on cultural awareness creates a foundation for further work by classroom teachers involving social justice and environmental action. To connect to the area of literacy and extend Donovan's (2016) and Waller and Barrentine's (2015) findings on place-based writing and reading strategies, writing could be further linked to place by including outdoor, cross-curricular, and community place-based writing experiences, while local reading materials could be used to enhance cross-curricular content learning across subjects like science and social studies.

Findings from empirical studies in place-based education literature demonstrated overall that student achievement of learning outcomes in place-based learning environments met or exceeded learning standards in traditional classroom settings (Buxton, 2010; Muthersbaugh et

al., 2014; Perkins et al., 2010; Zimmerman & Weible, 2017). In addition to promoting the Coast Salish moons as part of academic learning in school cultural plans through our school district's Na'tsa'maht Aboriginal Enhancement Agreement (School District 62, 2016) we also wanted to demonstrate for teachers how this kind of place-based, inquiry learning could support provincial learning outcomes. We centered our lessons around the attainment of content area learning outcomes in grade 3 and 4, and modeled a cross-curricular approach: in examining learning outcomes and skills that students are required to learn, we found that the subjects of English Language Arts, Social Studies, and Science were most suited to our goals of teaching about the Coast Salish moons through an Indigenous Knowledge-based inquiry framework. To provide teachers with a visual reference of our unit's connections to learning outcomes, we highlighted relevant learning outcomes that our unit addressed, and gave copies of this document to teachers. In so doing, we provided teachers with evidence that our teaching would support learning outcomes, in addition to modeling Indigenous Cultural Plans and promoting place-based learning. Place-based education literature promotes the inclusion of standardized learning outcomes in place-based education in order to make place-based education more accessible to teachers, (Buxton, 2010; Miller & Twum, 2015; Pike, 2011) which we aimed to do by making explicit connections to provincial learning outcomes.

My journey of reconciliation

6. "All Canadians, as Treaty peoples, share responsibility for establishing and maintaining mutually respectful relationships" (Truth and Reconciliation principles, National Centre *for* Truth *and* Reconciliation, n.d., p. 9)

8. "Supporting Aboriginal peoples' cultural revitalization and integrating Indigenous knowledge systems, oral histories, laws, protocols, and connections to the land into the

reconciliation process are essential” (Truth and Reconciliation principles, National Centre *for Truth and Reconciliation*, n.d., p. 10).

10. “Reconciliation requires sustained public education and dialogue, including youth engagement, about the history and legacy of residential schools, Treaties, and Aboriginal rights, as well as the historical and contemporary contributions of Aboriginal peoples to Canadian society” (Truth and Reconciliation principles, National Centre *for Truth and Reconciliation*, n.d., p. 10).

I have begun this final section with the above three principles for Truth and Reconciliation, which are most closely connected to education in general, and to my own work in the field of education, since I understand my work in the field of Aboriginal Education as supporting the Truth and Reconciliation Commission’s 10 principles of reconciliation and certain calls to action (National Centre for Truth and Reconciliation, n.d.).

Harasymchuk (2015) emphasized that non-Indigenous settler teachers must be particularly aware that “any action put forward is part of the decolonization or recolonization process” (p. 276). In my role, I have learned to reflect on pedagogies I use to ascertain whether or not certain lessons and strategies promote decolonization and indigenization of the curriculum. Harasymchuk posed an essential question: “What can be done to ensure this cycle (of decolonization and reinhabitation) continues and grows stronger through critical reflection, without descending into forms of recolonization in schools?” (p. 77). There is a need for all teachers to continually learn and develop their understanding professionally (see principle 6 above, Truth and Reconciliation Commission, n.d.) in order to promote student participation in and understanding of reconciliation with local Indigenous peoples (see principle 10 above, Truth and Reconciliation Commission, n.d.).

Classroom teachers and all levels of school district staff have also begun their journeys of decolonization, (Harasymchuk, 2015) and as Aboriginal Literacy teachers we can support them by providing resources and modeling in classrooms through programs such as the Coast Salish Moons Inquiry pilot project, and provide professional learning opportunities through our school district's Aboriginal Education Local Specialists' Association.

In my review of place-based education literature, Harasymchuk's (2015) interview findings revealed that teachers' cultures, backgrounds, and life experiences affect their understanding of decolonization in education (p. 274). When Harasymchuk (2015) asked teachers to define decolonization, they described it as a personal journey that individuals must experience for themselves (p. 275). In my teaching in Aboriginal Education over the past five years, I feel that I am now well on my way on my ongoing, personal path of understanding and participating in reconciliation. I consider myself very fortunate to be part of our school district's Aboriginal Education department, and to be provided with opportunities that encourage me to constantly reflect on the meanings of decolonization, reinhabitation (Gruenewald, 2003) and reconciliation. Both major pilot projects that I have co-developed in elementary Aboriginal Literacy for our school district, including the Grade 1-2 Aboriginal Literacy Read Aloud Program and the Grade 3-4 Coast Salish Moons Inquiry Pilot Project, have provided me with an array of opportunities to learn about authentic Indigenous learning resources and to learn from and through Indigenous Knowledge Keepers.

As Ngai and Koehn (2010; 2011) described in their research of place-based teachers' pedagogies when teaching in connection to Indigenous Knowledge, I believe a combination of cognitive or "customary" learning and emotionally-connected, or "boundary-breaking" learning (Ngai & Koehn, 2011) enables my progress on my journey of decolonization. As a Non-

Indigenous person who attended elementary and secondary school at a time when learning about Indigenous cultures and residential schools was not prevalent in classrooms, I consequently experienced a sharp but extremely enlightening learning curve when I first joined the Aboriginal Education department several days ago. As I continue to move through my journey of reconciliation, recently, I find that I gain new information and perspectives on reconciliation and its relevance to all Canadians on a near-daily basis, as I reflect on my experiences in schools through this pilot project and my cumulative Aboriginal Literacy teaching experiences.

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Appendix

Grade 3-4 Coast Salish Moons Inquiry Pilot Project

EDCI 598b
Chelsea
Richardson

Grade 3/4 Coast Salish
Moons Inquiry Pilot Project
(SD 62)

Territory Acknowledgment

I would like to acknowledge the traditional territories of Coast Salish Esquimalt and Songhees Nations, where I live. I would also like to acknowledge the three Nations Sooke School District works with, including Coast Salish T'Sou-ke Nation, Scia'new (Beecher Bay) Nation, and Nuu-chah-Nulth Pacheedaht Nation to the West. Further, I would like to acknowledge Elder Earl Claxton Jr. of WSANEC Nation for generously sharing his cultural knowledge and personal stories with us, and for providing valuable feedback on this project.
Hych'ka KLECO KLECO

I would also like to acknowledge my Aboriginal Literacy teaching colleague, Catrina Snook, the co-creator of this pilot project unit: this pilot project would not have been possible without her teamwork and insights!

What are the Coast Salish moons?



Image from The Spanish Year
(Claxton & Elliot, 1993).

- 13 Moons calendar was generously shared with SD 62 by WSÁNEĆ Nation
- Cultural and seasonal calendar based on lunar cycle and observable seasonal changes ("environmental indicators")
- most Nations across North America have their own cultural lunar calendars, or "seasonal rounds"

I am familiar with similar resources that are useful to talk about the general concept of Indigenous cultural seasonal rounds, including Thirteen Moons on Turtle's Back (Bruchac & London, 1997) which describes a selection of moons from cultures across North America, and a freely available online unit, "My Seasonal Round" (Province of BC, 2013) which intended for grade 4 and 5 students. In my teaching on the moons outside this project, I have found that the Coast Salish moons connect very well with learning about the phases of the moon, and that the Coast Salish moons also spark student curiosity around phenomena such as "blood moons" or eclipses.

Who was involved?

- Two Elementary Aboriginal Literacy teachers in SD 62 (myself and my direct colleague) created and implemented the project
- We met with our supervising District principal several times, who approved our unit plan. We had flexibility in how we planned and presented the material.
- A total of 13 grade 3 and 3/4 classes for a seven-lesson pilot project series (We each invited 6-7 classes to participate)
- We had a planning session with Elder Earl Claxton Jr. of WSANEC Nation, where he shared cultural teachings and stories for use in our lesson sequence

We invited classes based on whether they had at least one Aboriginal ancestry self-identified student, and prioritized classes with more than one Aboriginal student. (Our funding is based on 1701 funding regulations for Aboriginal Education in British Columbia). Since our first installment of this project was only for one term, we could not take on every class that was interested in participating. We also prioritized schools that we felt could use special attention (for example, small schools that might have been in need of more support). When we continue the project next fall with a focus on different moons in the cultural calendar, and new lessons, we intend to invite teachers whose classes we did not reach this term.

When and how did this project take place?

- During the moons of WEXES (Moon of the Frog) and PEXSISEN (The Blossoming Moon): February-April 2018
- used Aboriginal Literacy teaching time between myself and my direct colleague
- scheduled 7 sessions of 45 minutes to one hour with each class
- had time to plan and budget to purchase hands-on resources; some lessons were facilitated using existing Aboriginal Ed department iPads

Why did we create this project?

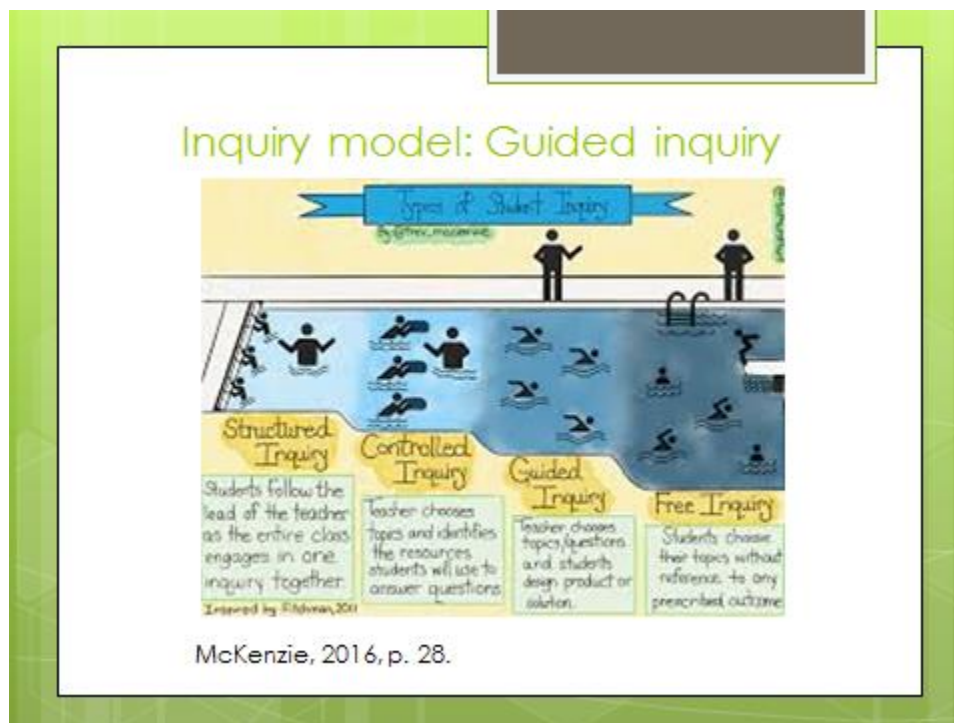
- to align with SD 62's Aboriginal Education Enhancement Agreement, Na'tsa'maht
- to model how a cultural plan based on the Coast Salish moons can be integrated with inquiry and place-based curriculum (inquiry and place-based learning are suggested strategies in the Revised 2016 BC curriculum)
- to match provincial Grade 3 and 4 learning standards in Language Arts, Social Studies, and Science (cross-curricular learning)
- to model how BC's core competencies connect with First Peoples Principles of Learning
- to involve local knowledge keepers in developing resources
- to integrate SENĆOŦEN language (and in some cases, Hul'q'umi'num language)

Part of our rationale for choosing this grade level was that we have been doing a grade 1-2 Aboriginal Literacy Read Aloud pilot project for the past 4 years that focused on reading picture books by Aboriginal authors from across Canada, and we felt that grade 3 and 3/4 would be a suitable level for a few reasons: we could “follow” students who we had worked with in their grade 1 and 2 school years, and most importantly, we chose grade 3 curriculum with some connections to the grade 4 curriculum because of the Social Studies focus on “Global Indigenous Peoples”. We then expanded curricular learning outcomes to include English Language Arts, Science, and Social Studies at the grade 3 and 4 levels. Our school district also has some existing place-based, Aboriginal Education programs in certain schools at the grade 4 and 5 level, so we felt that grade 3 was the area that could use the most curricular modeling.



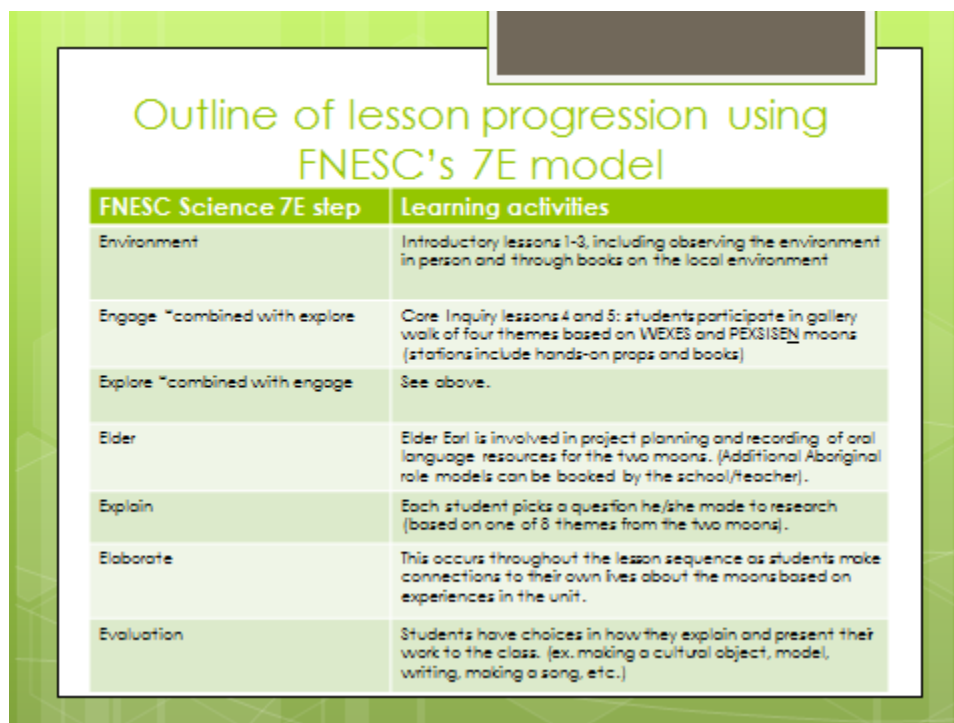
Our school district's second Aboriginal Enhancement Agreement, Na'tsa'maht, centers around two goals: One Spirit, and One Mind. The Coast Salish Moons grade 3/4 Inquiry Pilot project was created with both of these goals in mind: the project aims to create awareness for all students around local First Nations' cultures, while at the same time, providing experiences of culturally responsive learning content for Indigenous students.

As part of Na'tsa'maht, each school is responsible for developing their own cultural plan that particularly expresses the "One Spirit" goal. The cultural plan gives schools the opportunity to make teams of staff who think about their school's direction and plan specific Indigenous cultural events and learning experiences throughout the school year. The intent of our Moons Inquiry project is to provide an example of how a cultural plan based on the Coast Salish Moons can be integrated in academic learning at the elementary level.



The picture above provides a useful visual for the type of inquiry we chose. Our project is closest to a “guided inquiry” (McKenzie, 2016) although it shares some aspects of “controlled inquiry” (McKenzie, 2016). Although we did not make or choose questions that students were to explore, we did choose the general topics or themes (the two moons with four theme-based gallery walk stations each). It is more of a guided inquiry than a controlled inquiry, since students have created their own questions and will choose how to answer a question and what kind of product to make. It is similar to a controlled inquiry because the resources in the gallery walks were chosen by us, rather than students.

Students may need to use resources outside of our gallery walk resources to answer their questions, but it is also possible that many students will be able to answer their questions using materials provided. For an inquiry on Coast Salish culture such as this, we felt it was very important for students (and teachers) to engage in guided inquiry, as we could model the use of authentic, locally-developed resources.



FNEC Science 7E step	Learning activities
Environment	Introductory lessons 1-3, including observing the environment in person and through books on the local environment
Engage *combined with explore	Core Inquiry lessons 4 and 5: students participate in gallery walk of four themes based on WEXES and PEXISEN moons (stations include hands-on props and books)
Explore *combined with engage	See above.
Elder	Elder Earl is involved in project planning and recording of oral language resources for the two moons. (Additional Aboriginal role models can be booked by the school/teacher).
Explain	Each student picks a question he/she made to research (based on one of 8 themes from the two moons).
Elaborate	This occurs throughout the lesson sequence as students make connections to their own lives about the moons based on experiences in the unit.
Evaluation	Students have choices in how they explain and present their work to the class. (ex. making a cultural object, model, writing, making a song, etc.)

When planning our lesson sequence, we considered how each lesson or group of lessons fit in the 7E model of learning described by the BC First Nations Education Steering Committee's Science 5-9 resource. We felt that this would be the most culturally appropriate inquiry model to use, since FNEC is well known for creating and recommending authentic First Nations resources in BC.

The table above illustrates how we planned our lesson sequence to address each step of the 7E model (First Nations Education Steering Committee, 2016). I have used the word "step" to describe each element in the table, but really the "steps" are interwoven: in fact, all seven steps occur repeatedly throughout the lesson sequence, with the exception of "evaluation," which mostly takes place at the end.

Grade 3/4 Learning Standards

- o provided copies of learning standards to teachers that highlighted relevant learning standards in English Language Arts, Science, and Social Studies at both grade levels.
- o See the notes section below for a sampling of “Big Ideas” and main learning standards the unit is based on (there are too many to list in full here).

Social Studies 3: “Indigenous knowledge is passed down through oral history, traditions, and collective memory; Indigenous societies throughout the world value the well-being of the self, the land, spirits, and ancestors” (Province of BC, 2016, p. 1)

Science 3 and Science 4: “the knowledge of local First Peoples of ecosystems” (p. 1)

“Express and reflect on personal or shared experiences of **place**. Place is any environment, locality, or context with which people interact to learn, create memory, reflect on history, connect with culture, and establish identity. The connection between people and place is foundational to First Peoples perspectives of the world.

Key questions about place:

How does what you know about place affect your observations, questions, and predictions?

How does understanding place help you analyze information and recognize connections and relationships in your local environment?

How does place connect with stewardship?”

(Science 3, p. 3; Science 4, p. 7)

Science 4: “The motions of Earth and the moon cause observable patterns that affect living and non-living systems” (p. 5).

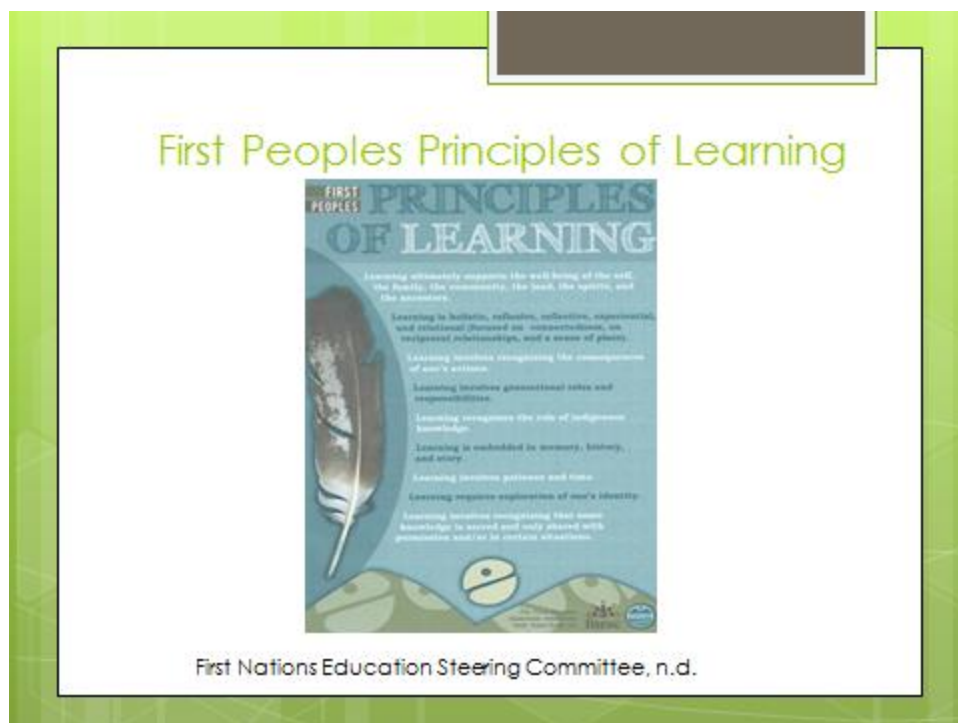
English Language Arts 3: “**Stories** and other **texts** help us learn about ourselves, our families, and our communities” (p. 1).

Curiosity and wonder lead us to new discoveries about ourselves and the world around us (p. 1)

English Language Arts 4: “Exploring **stories** and other **texts** helps us understand ourselves and make connections to others and to the world” (p. 5).



We embedded several of the Core Competencies in each lesson, and we provided an outline for teachers to know which competencies are the foci of the lesson (similarly to the 7E model, most of the competencies are interwoven throughout all of our lessons). We thought that teachers would appreciate modeling of how Core Competencies First Peoples Principles of Learning. The book The Six Cedar Trees (Landahl & Aleck, 2017) provides a similar framework to the Core Competencies (Government of BC, 2016) from a Coast Salish viewpoint, so we used this book to model habits of mind that would promote inquiry. (See Lesson 3 as well).



All of our lessons in the lesson sequence integrated the majority of the First Peoples Principles of Learning, and we provided an information sheet for teachers which provided an overview of the lesson sequence and listed Principles of Learning and Core Competencies that matched with each lesson in the unit.

Local Knowledge Keeper involvement

- Elder Earl Claxton Jr. provided feedback on the content and structure of our project
- He also kindly shared personal stories and traditional knowledge in person, which he gave permission for us to record and use in two slideshows for the moons WEXES and PEXSISEN (we chose pictures related to themes of each moon, and then inserted voice clips of Elder Earl speaking).
- We plan to include the voices of more knowledge keepers as the project continues next year

My colleague (Catrina) and I found our session with Elder Earl enlightening. His insight and knowledge was extremely valuable to our program and to our own professional learning. Next year, we hope to continue to work with Elder Earl, and other knowledge keepers in the Nations our school district works with to include a greater variety of local voices on the Coast Salish moons.

Infusion of local language

- Began lessons with greetings shared by Elder Earl – IY, SŁÁĆEL (meaning good day, used from afternoon onwards; pronunciation "aye squaychel") or IY, ŁÁĆIL (good morning - *exact orthography unknown and approximated by me here; pronunciation "aye quaceel") and taught students the reply "OO IY, (very good)" and "IY," (good).
- Used language or cultural objects as learning opportunities and/or attention getters – Ex. taught students the word WEXES (frog), and when we said "WEXES WEXES" the students had to reply "ribbit ribbit"; taught numbers 1-4 in SENĆOŦEN; used Coast Salish rattle or drum rhythms for transitions; Taught 5 animal names in SENĆOŦEN or Hul'q'umi'num; taught pronunciations of the two moons we studied

Reflection on use of Indigenous language in lessons:

In our lesson on The Six Cedar Trees, (Landahl & Aleck, 2017) (See Lesson 3), a few students remarked when they looked at our graphic organizer, "Why is Beaver only written in English?" This was a spontaneous learning opportunity on colonization and decolonization (Gruenewald, 2003) for students: I explained that the word was not available in the online SENĆOŦEN dictionary, which meant that potentially the word was lost in the process of colonization, or that perhaps there were speakers who knew it but it had not been shared yet in the dictionary (and had not been shared yet with us).

Two of my colleagues recently had relevant experiences with colonization, decolonization and language: (one was my teaching partner in this project) when they introduced to SENĆOŦEN or Hulqu'imi'num words to students in this age group, in at least two cases, a few individuals were shocked to learn that English is not in fact the first language in our area. Initially, these few students expressed disbelief at learning this. Since most students of most ethnicities in our schools have grown up speaking English and it is the primary language visible in the environment, it is not surprising that some students may hold this belief. I would expect that they may need repeated exposure to SENĆOŦEN and/or Hulqu'imi'num and ongoing discussions in order for them to fully develop their understanding of Indigenous languages as first languages. In my opinion, infusing language in lessons is important as a process of decolonizing or Indigenizing the curriculum, and it provides significant opportunities for impromptu discussions with students and classes about colonization and decolonization, since some students may have never heard the words before. When students first see SENĆOŦEN words, there is an immediate learning opportunity: they try to pronounce the words, and I explain, "Just wait a minute – the letters you see here are symbols for sounds, and are not pronounced like English – many of the sounds don't exist in English". When appropriate and given student interest, this sometimes extends into a discussion on how SENĆOŦEN and other First Peoples languages originally did not have writing systems (the written system for SENĆOŦEN was in fact created relatively recently by SENĆOŦEN speakers). For students who have had the opportunity in kindergarten to learn some language, (our school district has kindergarten SENĆOŦEN or Hulqu'imi'num language projects taught by elders in some schools) they are excited to hear and use the words again, and students who are from a local First Nation often demonstrate a sense of pride when using and hearing words from their language.

Lesson sequence:

- 7 lessons: 3 introductory lessons on inquiry through the lens of local Coast Salish Indigenous Knowledge and First Peoples Principles of Learning
- 2 inquiry lessons using gallery walk stations and artifacts (provocations) focusing on four themes for two moons of the Coast Salish 13 moons cultural calendar, and two Powerpoints including audio recordings generously shared by WSÁNEC Nation elder, Earl Claxton Jr.
- 2 concluding/celebrating lessons where students reflect on their questions and choose one of 8 themes to research or represent in a method of their choosing

The following slides will describe the individual lessons in detail.

Introductory Lessons (1-3)

- Goal: simultaneously introduce students to local Coast Salish Indigenous Knowledge, First Peoples Principles of Learning, and Inquiry learning
- Develop student awareness of the local environment, including local ecosystems (seashore and forest, since "environmental indicators" and cultural activities occur in these ecosystems in the 13 moons cultural calendar).
- Engage students' curiosity through using the 5 senses, and practice making observations, inferences, and questions
- Use new, locally-sourced Indigenous books and resources

Lesson 1 – Ocean Ecosystem - Hideaway Cove



- Hideaway Cove by Brenda Boreham
- Lesson activities: making observations using 5 senses, and making inferences, using a picture of local beach scene and then passing and describing a seashell.
- students circulated around the room in pairs to make observations and inferences using five key detailed seashore visuals from the book
- concluded by reading the book aloud, and asked students/discussed what kind of relationship they think local First Nations might have with the seashore environment

We chose recently-published book by Strong Nations publishing, Hideaway Cove, (Boreham & Timmermans, 2016) to introduce making observations using the 5 senses, making inferences, and exploring the local seashore environment, finally leading students to make inferences about what kind of relationship they think local First Nations might have with the seashore. Since we wanted this to be an inquiry process, rather than “telling” students, we left classes to consider our final question about First Nations’ relationships to the seashore environment: in some classes, students made logical inferences in answer to this question; in other classes, students did not necessarily readily have ideas, so we left them to think about it and provided opportunities to connect to this lesson in the next section. We chose to do our first lesson indoors (rather than the outdoors forest lesson) so that we could get to know the class composition a little in advance of taking students outside.

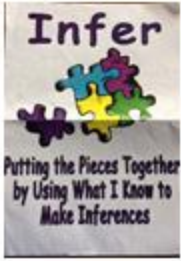
Reflection:

Hideaway Cove was an excellent choice for engaging students: it provides an Eagle’s-eye view of different areas in a small Vancouver Island cove, and gives subtle clues as to where the Eagle’s eye is going to turn next. This element was very engaging for students, and most classes wanted to discuss their observations of items in the book beyond the lesson time.

Lesson 1: Examples of observations and inferences



Photo by Catrina Snook





Hideaway Cove, (Landahl & Aleck, 2017)

Observations:

We began the lesson by using the seashore picture on the left, and asking students what they thought they could see, smell, touch, and hear at the beach. Then, we dug deeper and asked students what might also be at the beach or nearby that they couldn't actually see in the picture, but that they know or guessed might be there. A common answer students provided, was "there are crabs under the rocks" (students used their background knowledge of beach experiences). I explained that this was an example of making an inference, or making a guess about what is there based on background knowledge.

As another example of making observations and then making an inference, I had a pair of students do a demo for the class by using the picture on the right from Hideaway Cove. I asked them first, "What do you observe/see/notice in this picture?" (Typical answers included sea otters, kelp, shellfish, mussels, sea urchins). Then, I asked, "What do you think the otters are doing? Can you infer what the otters are doing?" (Those who had background knowledge about otters knew that they were collecting sea urchins to eat, and those who did not were still able to make the inference that the sea otters were searching for food).

Lesson 2 – Forest Ecosystem and I Wonder



- **Lesson activities:** more practice using five senses to make observations, and making inferences.
- held lesson outdoors in a forested area; paired up students
- **Activity 1:** walked to a nearby forested area; set a boundary, and had each student choose their own "spot" to sit and observe for a few minutes.
- asked students to observe their surroundings and think about how local First Nations might live in relationship to the forest.
- called students back to share observations with their partner and thoughts about how First Nations' uses of the environment.
- **Activity 2:** Students used iPads in pairs to take pictures of forest life and interesting plant or animal life that they found and wondered about.
- **Activity 3:** Upon return to class, read I Wonder (Klockars, 2013) and randomly selected a few student iPad pictures to practice questioning as a whole class.

Student pictures: Forest lesson



Reflection on Lesson 2: Above are some samples of pictures students took during the forest lesson. Students were given directions to look closely at the forest, and use their 5 senses to question or wonder about things they saw – and to take pictures of things they wondered about. Students shared the tablets in pairs, and we directed them to share back and forth and take a maximum of 10 pictures each, and only of forest life/objects (not people) to focus their attention on wondering about the forest environment. As a follow up in class, we read the reader I Wonder (Klockars, 2013). As a quick summary, of the lesson, I randomly chose a few tablet pictures and asked students to make “I Wonder” questions about each photo. Later in the week, I sent each classroom teacher a selection of their groups’ photos to continue practicing questioning techniques if they chose to do so.

Although I did not extensively survey students, all of the students were very engaged in this activity, and could have spent more time (or further sessions) doing this task or similar ones, and the students also enjoyed the opportunity to learn outdoors. Depending on cultural and natural seasonal connections, in further Moons Pilot projects, we may find inspiration to hold a greater number of lessons outdoors. The quality of pictures to a degree was affected by the locations available near schools, but overall we made it work even if the natural area was a small grove of trees in a schoolyard. The pictures on this slide are some examples that demonstrate students’ developing observation skills, as they often “zoomed in” or took pictures of items that piqued their curiosity. Finally, when undertaking the forest lesson, given that we planned the lesson to take place in February, some advance planning and flexibility was necessary in order to let teachers and students know to be prepared for the weather. We planned a flexible sequence for the first three lessons to be flexible (some classes did The Six Cedar Trees lesson second, while other classes did the Forest lesson second). Also, our iPads did not have cases, so we needed good weather in order to take pictures.

Lesson 3 – Habits of mind for inquiry (The Six Cedar Trees)



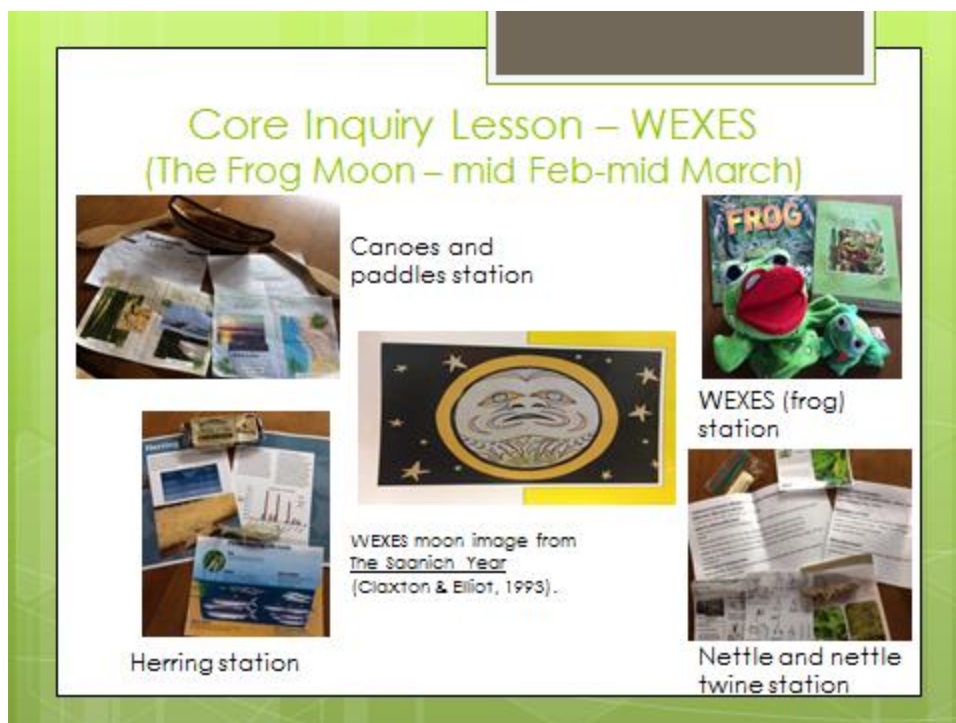
- The Six Cedar Trees by Margot Landahl and Celestine Aleck
- Activity 1: practiced words for local animals (see graphic on next page)
- Activity 2: read the book to students, pausing after each animal's sections to give students time to describe key characteristics of the animal's way of thinking or behaving.
- on the graphic organizer, students had a sticky note for each animal. I asked students to use one or more words to describe each animal.
- Activity 3: After reading the book and writing on the sticky notes, students put the corresponding sticky note on chart paper (one for each animal) around the classroom.
- Finally, students were asked, "Which animal speaks to you today?" and went to the poster for the animal they chose.
- At the poster, they had a conversation with others who chose the same animal. (Alternative Activity 3: hold a sharing circle to respond to the question).

The Six Cedar Trees Graphic Organizer

The Six Cedar Trees by Margot Landahl and Celestine Aleck		
1. Wolf - STRAAYE	2. Raven - SOTO	3. Salmon - SCANEW
4. Bear - SPALEY	5. Beaver	6. Orca - KELLOLEMECEN

Reflection on The Six Cedar Trees lesson: The students seemed engaged, despite this being quite a long book. The task of writing important characteristics about each animal as we went along tended to help with their focus. The information in this book could be used to plan classroom management strategies and assessment for a class for a whole school year. Instead of holding a lesson on the book The Six Cedar Trees (Landahl & Aleck, 2017), a potential idea for future enactments of this pilot project would be to read about one animal in the book per lesson, as this might be a more manageable amount of information for students to process in one sitting.

Throughout the “Core Inquiry lessons” (Lesson 4 and Lesson 5) I referred to the habits of mind of animals in this book: for example, at the beginning of the WEXES and PEXSISEN gallery walk lessons, I reminded students to be a “creative thinker,” like Raven, a “critical thinker,” like Salmon, and a “diligent collaborator,” like Beaver, since they needed to work individually to come up with creative, critical questions, but they also needed to cooperate since they were sharing the supplies at each gallery walk station with their classmates.



Lesson setup: For this lesson, a specific classroom setup was required, with four pods of desks around the room, (one for each of the four stations) with all student chairs in the middle of the room facing the projector.

Activity 1: Brief direct teaching – I began with a short explanation of the 13 moons cultural calendar, and explained how this lunar calendar is different from the Gregorian solar calendar that most people use daily. I also explained that students would be working individually but moving around the room in groups, and that they would be using the graphic organizer to ideally record at least one question and one connection for each station. (I set the expectation that most students should have something thoughtful written in all 8 squares, and suggested that if students found writing challenging, they should make a minimum of one comment or question for each of the four themes). I connected back to The Six Cedar Trees (Landahl & Aleck, 2017) and reminded students to be creative thinkers like Raven, critical thinkers like Salmon, and collaborators like Beaver.

Activity 2: Students circulated to each of the four stations, and spent about 7-10 minutes at each station. (In addition to the props displayed above, some of the stations had information on iPads to view; for example, the herring life cycle online, calls of local tree frogs, and a video of WSANEC Nation's reefnet fishery (their reefnets are traditionally made with nettle twine). At the nettle station, we provided nettle tea for students to taste, and we also provided "twine" (garden twine to simulate nettle twine) and encouraged students to try out making double-ply nettle twine using instructions.

Activity 3/Extensions: Whether I did this activity with classes or not depended on the length of our session (45 minutes or an hour), but I left any remaining activities for the teacher to follow up with later in the week. Activities I tended to leave for teachers at the end of the lesson included a discussion of student questions and connections from their graphic organizers and sharing of Elder Earl's oral stories and knowledge on the WEXES moon via the WEXES PowerPoint. I also left a follow-up summary page on the WEXES moon from the racerocks.ca website (Lester B. Pearson College of the Pacific, 2013) including questions for discussion and connections.

Reflection: Similarly to Lesson 2, (Forest Ecosystem) we noted overall that students were engaged in examining and questioning the objects. Of the four stations here, I believe students found the nettle station most engaging: we included twine and instructions for making 2-ply twine, which some of the students tried out, and students also enjoyed tasting nettle-mint tea at this station. This lesson greatly benefited from the support of multiple teachers and EAs in the classroom, when available, to help students "wonder" about the items and deepen their thinking.

WEXES graphic organizer

WEXES – Moon of the Frog YTE NE SNA (My name is...)

Station	Questions I have about the item(s)	Connections or interesting facts about the item(s)
1. WEXES - frog 		
2. Nettle hairbrush net TEXTEX (nettle) 		
3. Canoe and paddles 		
4. SLOJIT - herring 		

Reflection on layout/structure of the graphic organizer: We used SENĆOTEN words and phrases where available to indigenize the content. Although each of the moons arguably have more than four themes, and some of the items (like nettle) are worked with year-round, we decided on four themes for each of the two moons as a manageable number of stations for students to visit.

Most students were able to make comments or questions in 4-8 squares of the table, with varying degrees of complexity. After trying out this lesson, we thought in that the titles of the two columns (“Questions” and “Connections”) could be changed to better reflect the pedagogical choices we made in the unit: for example, “Questions” could read as “I Wonder...” and “Connections” could read as “I observe/notice/see/smell/touch/feel/taste” with graphics representing the five senses.



Lesson setup:

Like the WEXES lesson, the PEXSISEN lesson required a specific classroom setup of four 4 pods of desks around the room, (one for each of the four stations) with all student chairs in the middle of the room facing the projector or smartboard. I found that this lesson ran more smoothly and I was able to cover more ground, since students and teachers knew what to expect for the classroom layout (shaking up their normal classroom structure was initially unsettling for some students who thrive on routine).

Activity 1: Brief direct teaching: I reminded students of the expectations for work at the stations (see comments on WEXES lesson on slide 24). This time, I also had students make predictions about what some themes of the PEXSISEN moon might be by having them do a partner share about what they observed in the PEXSISEN moon image (Claxton & Elliot, 1993) and then sharing out with the whole class.

Activity 2: Students circulated to each of the four stations, and spent about 7-10 minutes at each station. This time, we elected not to use iPads in the stations because we felt that sometimes iPad videos and sounds distracted from the other artifacts at the stations in the WEXES lesson. Like the previous lesson, students appeared to be quite engaged in examining and connecting to or questioning the items.

Activity 3/Extensions: Since the setup of this lesson was more efficient due to teacher and student familiarity with the setup from last time, I was able to share Elder Earl's speaking on the PowerPoint presentation during my teaching time. (We designed the two PowerPoints to be an interactive summary of each of the moons, with "buttons" on images on the screen that linked to Elder Earl's voice clips). What I learned from having the classes listen to Elder Earl's speaking clips, was that they were very engaged during one story about how SMIEF (deer) came to be, but some students appeared a bit disengaged during the technical descriptions of cultural practices, probably due to the duration of students' focus at this age level. A solution would be to only listen to key portions of Elder Earl's descriptions, or make shorter clips next time. Before listening, I suggested that students should demonstrate respect for Elder Earl's speaking just as they would if he were present in the classroom, which I think helped students listen as respectful audience members. As I did for the WEXES lesson, I left a follow-up summary page for teachers on the PEXSISEN moon from the racerocks.com site (Lester B. Pearson College of the Pacific, 2013), including questions for discussion and connection to use with the class.

PEXSISEN graphic organizer

PEXSISEN - Moon of Opening Hands/Blossoming Moon _____ TTE NE SNA (My name is...)

Station	Questions I have about the item(s)	Connections or interesting facts about the item(s)
CENKLES - Spring SPAZEN - flower 		
Shellfish (mussels, oysters, and clams) 		
XFA - Cedar and cedar bark stripping 		
Scudde whorls and wool dogs 		

Concluding/Celebrating Lessons : Inquiry booklet sample

----- TTE NE SNA
(My name is...)

My WEXES and PEXSISEN Inquiry Booklet

Topic:

I wonder...

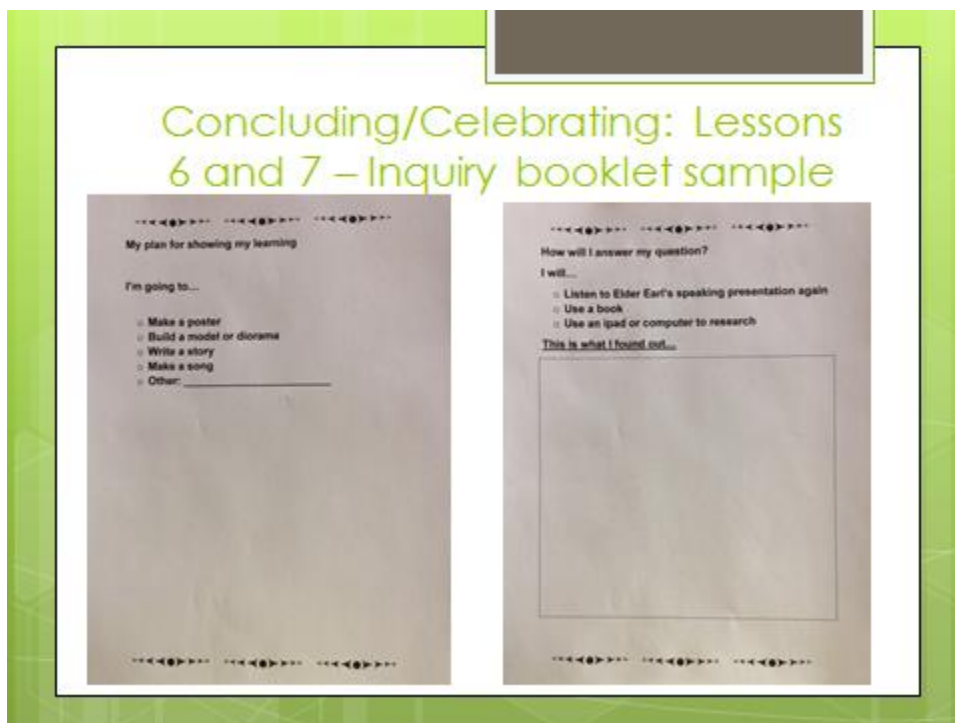
We have not yet taught the two final lessons (Lesson 6 and Lesson 7), but we have created a draft of the Inquiry booklet pages (on this slide and the next) that we plan to use with classes.

Anticipated sequence for Lesson 6

Lesson Setup: This lesson will require the same classroom setup as for lessons 4 and 5, but with eight pods of desks for all eight themes.

Activity 1: I will give a brief explanation to students of the booklet structure. All eight stations (four for WEXES and four for PEXSISEN) will be set up around the room. Students will refer to their graphic organizers completed in the previous lessons to make a decision about which topic they would like to examine before going to one of the stations (or at least narrow it down to a few topics by revisiting a few stations) . Students will go to one station (or maybe two or three stations if they need to narrow down their choice) to fill in their topic and choice of “I Wonder” question (on page two of the booklet), and make a plan of how they are going to carry out their research and present their inquiry work (see page 3 of the booklet on the next slide).

We anticipate that many student questions will be answerable by referring to Elder Earl’s speaking presentations on the PowerPoints or by using resources we provided at the stations. Some of the questions they come up with may be related to general wonderings about nature rather than specifically connected to cultural items or practices, but it doesn’t concern us if several students do not specifically research Coast Salish cultural practice since they will have been exposed to learning about seasonal cultural practices throughout the unit.



Anticipated sequence for Lesson 7:

Option 1: Some teachers may be inclined to spend additional class time before the final lesson on students' inquiry research or project designs, and if so, we may be able to use Lesson 7 for students to have a celebration of learning where present their findings. Ideally, if there is time to present students' work, we would likely encourage classes to pair up with one or more younger classes to present their learning to younger students in pairs (this type of presentation is likely to be non-threatening, and serves the dual purpose of creating greater awareness of Coast Salish cultural themes throughout the school while students demonstrate their learning). In addition, this type of presentation/celebration models intergenerational learning as part of the First Peoples Principles of Learning by having grade 3s teach younger students. Ideally, we would also have cultural teas and snacks (potentially salmon) available for students to sample during the celebrating/presenting lesson, as this would reflect cultural practices.

Option 2: If a given class has not spent additional time working on or researching their topics, then this class period will be used to support students in researching and creating their final products. If the timeline does not work for presentation in this class period, we will offer teachers some culturally relevant suggestions (see above) for celebrating and presenting students' work. We could also recommend that classes invite an Aboriginal role model from our school district's Aboriginal Role Model program to open and close the presentation activity and work with the class.

Potential unit assessment page

---<●>--- ---<●>--- ---<●>---

Celebration and Assessment of my learning

During this unit, I was like each of the animals in these ways:

I was a good communicator like Wolf when I...

Presented or shared my learning

Worked cooperatively with others

I was a creative thinker like Raven when I...

was playful or enjoyed items at the stations

worked to make my inquiry idea come to life

I was a critical thinker like Salmon when I...

asked questions and made connections

experimented when trying new things and doing my research

I was like Bear when I...

felt proud about the work I've done in this unit

I was a collaborator like Beaver when I...

was kind and respectful to others

helped others find information or solve problems

I was like Otter when I...

noticed some parts of this project might have been easier for me than others.

One thing I did well:

One thing I'd do differently next time:

---<●>--- ---<●>--- ---<●>---

Reflection on draft unit assessment page:

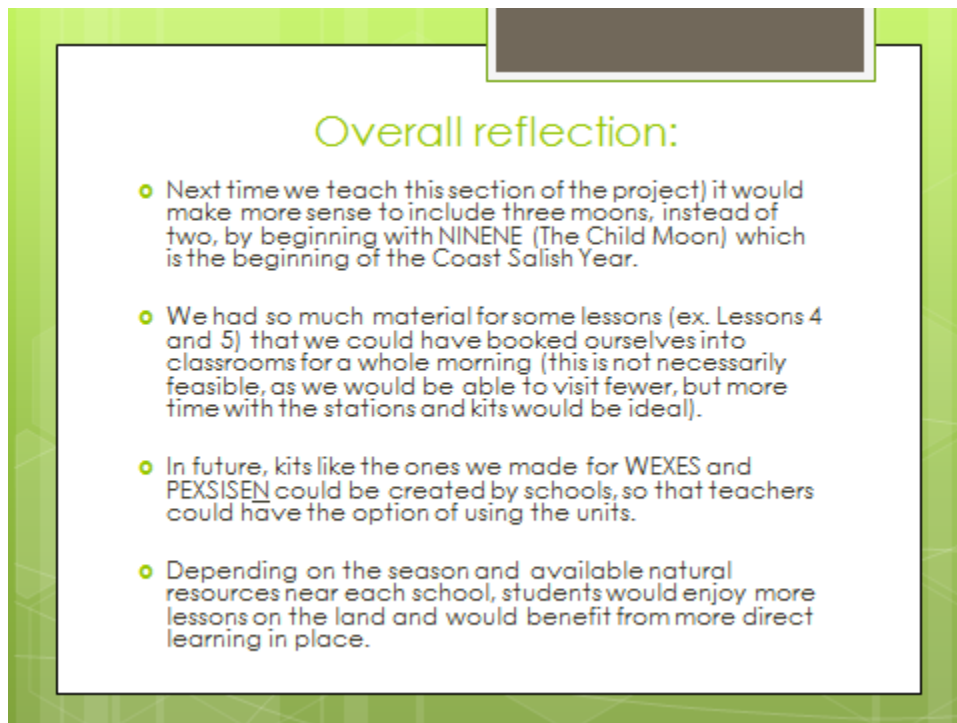
The unit assessment page will likely give students opportunities to reflect on their learning in reflection to the habits of mind demonstrated by the six animals in The Six Cedar Trees (Landahl & Aleck, 2017). The behaviours of the six animals are also closely connected to the Core Competencies (Government of British Columbia, 2016). Although this page is not quite complete, beside each statement, we are planning to have smiley, neutral, and frowny faces that students can mark to show their assessment of their own work in relation to the habits of each animal.

Connections to literature on place-based education

- o Please see attached word document for a thorough reflection on how this inquiry unit connects to literature on place-based education, including direct references to place-based education literature.

Examples of this project's connections to place-based education literature:

- o pedagogical style that focuses on "wondering" about experiences and objects and exploring information; aims to engage students; use of cross-curricular approach
- o use of culturally relevant, locally-developed educational materials and print resources (Strong Nations Publishing) without relying on print resources; included images, artifacts, and oral language teachings from Elder Earl.
- o focus is on local, Coast Salish Indigenous Knowledge-based learning, which is both land-based and place-based
- o connects to critical place-based pedagogy via the concepts of decolonization and reinhabitation (Gruenewald, 2003) and reconciliation
- o directly connected to BC curricular outcomes, which promote place-based, Indigenous-Knowledge based programs



Overall reflection:

- Next time we teach this section of the project) it would make more sense to include three moons, instead of two, by beginning with NINENE (The Child Moon) which is the beginning of the Coast Salish Year.
- We had so much material for some lessons (ex. Lessons 4 and 5) that we could have booked ourselves into classrooms for a whole morning (this is not necessarily feasible, as we would be able to visit fewer, but more time with the stations and kits would be ideal).
- In future, kits like the ones we made for WEXES and PEXSISEN could be created by schools, so that teachers could have the option of using the units.
- Depending on the season and available natural resources near each school, students would enjoy more lessons on the land and would benefit from more direct learning in place.

Notes on comments from reflection slide:

In connection to the first comment, we did originally plan to start with the first moon of the New Year, but due to illness and missing some of our planning time, we decided to limit the unit to two moons. (It would have been possible but challenging to include gallery walks for three moons in a seven-lesson format).

In connection to the third comment on this slide, I think students would enjoy and benefit from additional outdoor experiential lessons in future lesson sequences. These kinds of lessons could potentially involve role models, and include observing culturally important plants or animals, and include harvesting certain plants when appropriate, or participating in cultural activities (ex. harvesting plants for teas, planting native plants in a garden and observing their growth, planting and or harvesting and making food, tea, or twine using nettle, harvesting or using cedar to make objects, and storytelling experiences). Several of these types of activities would match well with specific moons in other times of the year.

Potential teacher feedback:

- Please list your thoughts on how the Coast Salish Moons Inquiry Pilot Project supported your class' understanding of the Coast Salish Moon Calendar.
- Number and length of lessons: Were they just right, too long, too short, too many lessons, just the right number of lessons, more lessons? (Please explain why).
- In your opinion, was the inquiry approach used in the lessons appropriate overall for students in your class? Was it too easy, just right, or too challenging? (Please explain your choice)
- Which lesson activities did you find the most useful? Please explain.
- Were there any lesson activities that could be designed differently or changed to better accommodate your students' learning, or any lesson activities that were not beneficial? Please explain.
- Please rate the contents of the teacher folder we created – did you find the contents useful? Were any of the contents redundant for you?

We are considering surveying teachers about the content and strategies we used in this year's Pilot Project in order to develop further similar lessons next school year. The questions on this slide could potentially provide us with useful feedback in developing further Inquiry units on the Coast Salish Moons.